ORACLE EXHIBIT 1025

PART 2

C48

CROSSROADS VS. CHAPARRAL
CIVIL ACTION NO. A-00CA-217SS
PLAINTIFF'S FOURTH AMENDED TRIAL EXHIBIT LIST
(updated 9/11/01)

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-1		N/A	8/24/99	U. S. Patent No. 5,941,972 to Hoese (certified copy)		9/4/01	9/4/01
P-2	N/A	N/A	Pre-8/24/99	File Wrapper for U. S. Patent No. 5,941,972 (certified copy)		9/4/01	9/4/01
P-3	N/A	N/A	4/27/01	Declaration of Geoff Hoese in Support of Crossroads' Opposition to Pathlight's Motion for Summary Judgment	Hearsay; Relevance		
P-4	Hoese Exhibit 2	CRDS 40807 – CRDS 40823	6/19/96	PowerPoint Presentation: Verrazano FC-SCSI Bridge Product Overview		9/4/01	9/4/01
P-5	Hoese Exhibit 3	CRDS 40925 – CRDS 40958 (mixed pages)	9/10/96	Confidential Document: Verrazano Software Development		9/4/01	9/4/01
P-6	Hoese Exh. 4	CRDS 39727 – CRDS 39758	1/22/97	Verrazano System Structure		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-7	Hodges Exh. 5/ Hoese Exh. 24	CRDS 40510 – CRDS 40512	5/28/97	Fax from Geoff Hoese to Anthony Peterman enclosing Conception of Invention	Hearsay; Relevance	9/5/01	9/5/01
P-8	Sims Exh. 4	CRDS 28244 – CRDS 28400	7/14/99	PowerPoint Presentation: Organizational Meeting		9/4/01	9/4/01
P-9	LiVolsi Exh. 9	CRDS 42968 – CRDS 43033	11/3/98	Crossroads Presentation to Dell Computer		9/4/01	9/4/01
P-10		N/A	8/17/01	Expert Report of Kenneth E. Kuffner, including all exhibits attached thereto and documents cited therein	Hearsay		
P-11	Zinger Exh. 320	N/A		Billing Records produced by David Zinger, Esq.	Relevance; Attorney-Client Privilege (for portions)	9/10/01	9/10/01
P-12	Walker Exh. 112	CNS 033582 – CNS 033609	2/18/00	Presentation by Chaparral Network Storage to EMC2, Chaparral Fibre Channel-to-SCSI Routers		9/4/01	9/4/01
P-13	Selinger Exh. 317	N/A	2/22/00	Chaparral Independent Contractor/Consultant Agreement between Chaparral and Selinger		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-14	Selinger Exh. 310	CNS 187010 – CNS 187023	2/22/00 – 3/14/00	2/22/00 - 3/14/00 Selinger notes		9/4/01	9/4/01
P-15	Walker Exh. 132	CNS 174026 – CNS 174030	2/29/00	Email to Mike Gluck and Jerry Walker from Bob Selinger		9/4/01	9/4/01
P-16	Zinger Exh. 322	N/A	3/1/00	3/1/00 Letter from C. Jennison to Zinger pertaining to '972 patent		9/4/01	9/4/01
P-17	Selinger Exh. 304	CNS 012945 – CNS 012949		Invoices and expense reports from Selinger to Chaparral		9/4/01	9/4/01
P-18	Zinger Exh. 321	N/A	3/8/00	Letter from Zinger to Walker enclosing various patents		9/4/01	9/4/01
P-19	Selinger Exh. 308	CNS 039583 – CNS 039584	3/14/00	Email from Selinger to Walker regarding Overpass status		9/4/01	9/4/01
P-20		CNS 172469	7/27/98	7/27/98 Lab notes (Walker)		9/4/01	9/4/01
P-21	Rahmani Exh. 98	PTI 165641 – PTI 165657		Letter from Alan Albright to Chaparral enclosing Complaint (faxed on this date to/from Pathlight to Chaparral	Hearsay; Relevance	9/10/01	Excluded
P-22	Gluck Exh. 48	CNS 041062	4/10/00	Memo to Dave Trachy from Michael Gluck		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-23	Walker Exh. 131	CNS 174031 – CNS 174032	4/13/00	Letter to KPMG, LLP from David F. Zinger		9/4/01	9/4/01
P-24	Walker Exh. 111	CNS 0045915 – CNS 0045945	4/18/00	PowerPoint Presentation: 4/18/00 IBM Tucson, Chaparral Network Storage Fibre Channel/SCSI Routers		9/4/01	9/4/01
P-25		CNS 001207 – CNS 001209	12/2/99	Memorandum from Mike Gluck to File re Conversation with Terry Roelands & Peter Campagna		9/4/01	9/4/01
P-26	Bleakley Exh. 341	CNS 043352 – CNS 043411		Bleakley Lab Notebook		9/4/01	9/4/01
P-27	Gluck Exh. 52	CNS 173894 – CNS 173923	6/14/00	6/14/00 Letter to Jerry Walker from David Zinger marked "Draft"		9/4/01	9/4/01
P-28	Zinger Exh. 324	N/A	6/8/00	Letter from Zinger to Walker enclosing draft opinion		9/4/01	9/4/01
P-29	Zinger Exh. 325	N/A		Series of Emails attaching the Markman Order		9/4/01	9/4/01
P-30	Walker Exh. 337	N/A	10/6/00	A8526 RAID Controller Marketing Requirements Documents, by Durk Watts		9/4/01	9/4/01
P-31	Zinger Exh. 330	N/A	11/13/00	Letter to Michael Barrett, Esq. from Gray Cary	Relevance; Prejudicial	9/10/01	

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-32	Walker Exh. 136	CNS 173589 – CNS 173893	11/20/00	Opinion Letter from David Zinger to Jerry Walker		9/4/01	9/4/01
P-33	Niemann Exh. 277	CNS 186217	7/17/01	CNSi FC-SCSI Product Shipments with LUN Zoning		9/4/01	9/4/01
P-34	Selinger Exh. 314	CRDS 64447- CRDS 64451	6/13/01	Consent Judgment from the Pathlight matter	Hearsay; Relevance; Prejudicial; Fed. R. Evid. 408	9/6/01	9/6/01 (redacted version)
P-35	N/A	CNS 007524 – CNS 007589	March 2000	Securities and Exchange Commission Form S-1 filed by Chaparral		9/4/01	9/4/01
P-36	Gluck Exh. 47	CNS 039583 – CNS 039584	3/14/00	3/14/00 Memo to Jerry Walker from Bob Selinger		9/4/01	9/4/01
P-37	Gluck Exh. 49	CNS 000305 – CNS 000306	4/19/00	4/19/00 Memo from Nigel Squibb to Michael Gluck with attachments		9/4/01	9/4/01
P-38	Gluck Exh. 50	CNS 000297 – CNS 000302		Copies of Fax Transmittal cover sheets		9/4/01	9/4/01
P-39	Gluck Exh. 53	CNS 040708 – CNS 040824		Handwritten notes of Jerry Walker	Attorney-Client Privilege (for portions)	9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-40	Walker Exh. 130	CNS 039583 – CNS 039584	3/14/00	3/14/00 Email to Jerry Walker from Bob Selinger		9/4/01	9/4/01
P-41	Walker Exh. 132	CNS 174026 – CNS 174030	2/29/00	2/29/00 Email to Mike Gluck and Jerry Walker from Bob Selinger		9/4/01	9/4/01
P-42	Walker Exh. 133	CNS 174036	11/27/00	11/27/00 Letter to Whom It May Concern from Eugene C. Nagle at Quantum		9/4/01	9/4/01
P-43	Walker Exh. 134	CNS 172387 – CNS 172546		Jerry Walker lab notebook	Attorney-Client Privilege (for portions)		
P-44	Walker Exh. 141	CNS 173524		Email from David Trachy (Storage Tek) to Michael Alam re patent issues (Redacted)		9/4/01	9/4/01
P-45	Walker Exh. 142	CNS 173528 – CNS 173530		Interoffice Memorandum from The Chairman to All Employees re "Making Good Things Happen"		9/4/01	9/4/01
P-46	Walker Exh. 143	CNS 161863 – CNS 161878	4/12/00	Minutes of the Meeting of the Board of Directors April 12, 2000		9/4/01	9/4/01
P-47	Walker Exh. 144	CNS 0048544 – CNS 0048576		File entitled "Crossroads Patent" and containing International Patent publication No. WO 99/34297		9/4/01	9/4/01

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P-48	Zinger Exh. 318	N/A	10/6/00	10/6/00 Fax from Walker to Zinger attaching information on reserve/release command		9/4/01	9/4/01
P-49	Zinger Exh. 319	N/A	4/24/00	4/24/00 email between Zinger, Walker and others discussing Crossroads patent		9/4/01	9/4/01
P-50	Zinger Exh. 322	N/A	3/1/00	3/1/00 Letter from C. Jennison to Zinger pertaining to '972 patent		9/401	9/4/01
P-51	Zinger Exh. 323	N/A	3/9/00	3/9/00 Letter from Zinger to Walker discussing Crossroads patent applications		9/4/01	9/4/01
P-52	Lavan Exh. 25 (Pltf. Exh. 215)	CNS 0045238	3/6/00	3/6/00 Memo to Lavan from Matthews		9/4/01	9/4/01
P-53	Lavan Exh. 26 (Pltf. Exh. 216)	N/A		User's Guide, G6322/G7324 (Pltf. Exh. 216)		9/4/01	9/4/01
P-54	N/A	CNS 023824	5/24/00	Email from Pat Foose to Harris Ravine re LUN Masking, with handwritten notes		9/4/01	9/4/01
P-55	N/A	CNS 188463 – CNS 188469	7/31/01	Engineering Change Notice re A8526 code upgrade		9/4/01	9/4/01
P-56	Walker Exh. 78	CNS 0048165 – CNS 0048167	2/7/00	Memorandum to Jerry Walker from Don Matthews re FS1310 Features		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-57	Walker Exh. 85	CNS 042932 – CNS 042945	1/10/00	CAPI Functional Specification – Version 3.0 (Router Errata), Configuration Application Programming Interface for Chaparral External RAID Controllers and Routers, Document Revision :1, Preliminary		9/4/01	9/4/01
P-58	Walker Exh. 114	CNS 0051329 – CNS 0051331	6/30/99	Document entitled C:\Windows\Temp\FS1310 Perf comparison.doc 6/30/99		9/4/01	9/4/01
P-59	Walker Exh. 123	CNS 032396 – CNS 032398	3/27/00	Memorandum to Jerry Walker from Tom Lavan		9/4/01	9/4/01
P-60	Walker Exh. 124	CNS 032406 – CNS 032410	5/1/00	Memorandum to Jerry Walker from Tom Lavan re Weekly Status		9/4/01	9/4/01
P-61	Selinger Exh. 305	CNS 174026 – CNS 174030	2/29/00	Email from Selinger to Gluck attaching Overpass Report		9/4/01	9/4/01
P-62	Engelbrecht Exh. 9	LSI 01853 – LSI 02040	9/96	RAID Manager 5 With RDAC 5 For UNIX V.4 User's Guide		9/4/01	9/4/01
P-63		N/A	8/10/01	Expert Report of D. Paul Regan, CPA, CFE, including all exhibits thereto and documents cited therein	Hearsay		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-64		N/A	8/17/01	Expert Report of Kenneth Flamm	Hearsay		
P-65	Smith Exh. 4	CRDS 52581 – CRDS 52641	4/26/97	OEM License and Purchase Agreement Between Crossroads and Hewlett-Packard		9/4/01	9/4/01
P-66	Smith Exh. 6	CRDS 02273 – CRDS 02290	4/15/98	Hewlett-Packard SSD and Crossroads CP4200 License Agreement		9/4/01	9/4/01
P-67	Smith Exh. 7	CRDS 29603 – CRDS 29646	9/22/98	Purchase and License Agreement Between Hewlett-Packard and Crossroads		9/4/01	9/4/01
P-68	Flamm Exh. 5 (Livolsi Exh. 16)	CRDS 39764 – CRDS 39788	2/7/00	SWOT Analysis		9/4/01	9/4/01
P-69	N/A	CRDS 22345 – CRDS 22346	2000	Charts pertaining to Competition	Hearsay		
P-70	N/A	CRDS 39765 – CRDS 39773	2/7/00	Competitive Snapshots	Hearsay		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-71	N/A	CRDS 64618 – CRDS 64619; CRDS 63622-CRDS 63623	6/23/00	Amendment to Licensing Agreement By and Between Hewlett-Packard and Crossroads Systems, Inc. (signed version)		9/4/01	9/4/01
P-72	Walker Exh. 118	CNS 037349 – CNS 037358		PowerPoint Presentation: Competitive Landscape (Routers)		9/4/01	9/4/01
P-73	Niemann Exh. 279	CNS 186219	6/30/01	Statement of Cash Flows, 6/30/01		9/4/01	9/4/01
P-74	Niemann Exh. 280	CNS 186220	6/30/01	Financial Statement, 6/30/01		9/4/01	9/4/01
P-75	Niemann Exh. 281	CNS 186221 – CNS 186229		Q1 FY –02 Gross Router Revenue		9/4/01	9/4/01
P-76	Niemann Exh. 282	CNS 186230	3/31/01	Income Statement Year Ended 3/31/01		9/4/01	9/4/01
P-77	Niemann Exh. 283	CNS 186231 – CNS 186233	2000	Revenues Q2 '00		9/4/01	9/4/01
P-78	Niemann Exh. 284	CNS 186234 – CNS 186240	2001	Q4 FY '01 Gross Router Revenue		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-79	Niemann Exh. 285	CNS 186245 – CNS 186249		LUN Zoning Shipments to Date		9/4/01	9/4/01
P-80	Niemann Exh. 286	CNS 186250 – CNS 186257		Product/Cost/Unit Chart		9/4/01	9/4/01
P-81	Niemann Exh. 287	CNS 186170		CNSi FC-SCSI Product Shipments with LUN Zoning		9/4/01	9/4/01
P-82	Niemann Exh. 288	CNS 186171 – CNS 186184		Inventory Plan		9/4/01	9/4/01
P-83	Niemann Exh. 289	CNS 186185		Product Cost (Fully Loaded Cost)		9/4/01	9/4/01
P-84	Niemann Exh. 290	CNS 186186		Product Cost		9/4/01	9/4/01
P-85	Niemann Exh. 291	CNS 186187 – CNS 186195		Product Masterschedule		9/4/01	9/4/01
P-86	Niemann Exh. 292	CNS 186196 – CNS 186204		Product Masterschedule		9/4/01	9/4/01
P-87	Niemann Exh. 293	CNS 186205 – CNS 186211		Product Masterschedule		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-88	Niemann Exh. 294	CNS 186212 – CNS 186216		Product Masterschedule		9/4/01	9/4/01
P-89	Niemann Exh. 295	N/A	3/1/01	Invoice to Adaptec, 3/1/01		9/4/01	9/4/01
P-90	Niemann Exh. 296	N/A	6/1/01	Invoice to Arrow, 6/1/01		9/4/01	9/4/01
P-91	Niemann Exh. 297	N/A		Detail Account Transactions		9/4/01	9/4/01
P-92	Niemann Exh. 298	N/A	11/25/98	Technology Cross-License Agreement with Adaptec		9/4/01	9/4/01
P-93	Niemann Exh. 299	N/A	6/25/01	OEM Purchase and License Agreement		9/4/01	9/4/01
P-94	Niemann Exh. 300	N/A	2000	Income Statement FY '00		9/4/01	9/4/01
P-95	Niemann Exh. 301	N/A	2001	Income Statement FY '01		9/4/01	9/4/01
P-96	Niemann Exh. 302	N/A	2001	Income Statement FY '02		9/4/01	9/4/01
P-97	Walker Exh. 334	N/A		Log-in Page from Chaparral Website		9/4/01	9/4/01
P-98	Walker Exh. 335	CNS 185379 – CNS 185394		Chaparral "Quick Start Guide"		9/4/01	9/4/01
P-99	Walker Exh. 336	N/A		Page from Chaparral Website pertaining to RAID controllers		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-100	Walker Exh. 337	CNS 186686- CNS 186702	10/6/00	A8526 RAID Controller Marketing Requirements Documents, by Durk Watts		9/4/01	9/4/01
P-101	Walker Exh. 88	CNS 0046546 – CNS 0046548	5/22/00	5/22/00 Memorandum to Jerry Walker from Tom Lavan		9/4/01	9/4/01
P-102	Walker Exh. 94	CNS 024788	11/10/99	11/10/99 Email to various people at Chaparral from Lambertus	Hearsay; Relevance		
P-103	Walker Exh. 95	CNS 025879	2/2/00	2/2/00 Email to Jerry Walker, Bob Morris, Tom Lavan from Bruce Lambertus	Hearsay		
P-104	Walker Exh. 103	CNS 000550 – CNS 000617	5/24/00	5/24/00 PowerPoint Presentation: Dell Computer, Chaparral Network Storage Fibre Channel/SCSI Routers		9/4/01	9/4/01
P-105	Walker Exh. 133	CNS 174036	11/27/00	11/27/00 Letter to Whom It May Concern from Eugene C. Nagle at Quantum		9/4/01	9/4/01
P-106	Permut Exh. 176	CNS 175975 – CNS 175976	5/1/00	5/1/00 Memorandum re FS1310 Router Version 4.0		9/4/01	9/4/01
P-107	Permut Exh. 177	CNS 175979	5/8/00	5/8/00 Email from Al Permut re changes to Router Code 4.0		9/4/01	9/4/01
P-108	Permut Exh. 178	CNS 175982 – CNS 175983	5/16/00	5/16/00 Memorandum re FS1310 Router Version 4.0		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-109	Permut Exh. 179	CNS 175980 – CNS 175981	5/19/00	Engineering Change Notice, 5/19/00 Router Code Version 4.0		9/4/01	9/4/01
P-110	Permut Exh. 180	CNS 175986 – CNS 175987	6/7/00	6/7/00 Memorandum re FS1310 Router Version 4.1		9/4/01	9/4/01
P-111	Permut Exh. 181	CNS 175988	6/7/00	6/7/00 Email from Jim Jones re Router Code Version 4.1		9/4/01	9/4/01
P-112	Permut Exh. 182	CNS 175984 – CNS 175985		Engineering Change Notice Router Code Version 4.10		9/4/01	9/4/01
P-113	Lavan Exh. 24 (Pltf. Exh. 214)	CNS 0045256	5/16/00	Memo to Michael Gluck, et al., from Morris		9/4/01	9/4/01
P-114	Regan Exh. 1 (from Pathlight case)	N/A	3/13/01	Expert Report of D. Paul Regan, CPA, CFE, including all exhibits thereto and documents cited therein (prepared in Pathlight case)	Hearsay		
P-115		CRDS 64613 – CRDS 64617		Revised HP 4200 Royalty Revenue Schedule and Schedule of Income from HP (prepared by Paul Regan)	Hearsay		
P-116		CRDS 64609 – CRDS 64612		Revised Crossroads Financial Information (prepared by Paul Regan	Hearsay		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-117		CRDS 64600 – CRDS 64608	6/12/01	Pathlight/Crossroads Settlement and License Agreement	Hearsay; Relevance; Prejudicial; Red. R. Evid. 408	9/6/01	No; objection sustained
P-118		CRDS 64621 – CRDS 64622	11/8/00	Chaparral Press Release printed from Chaparral Web Site		9/4/01	9/4/01
P-119		CRDS 64623 – CRDS 64624	2/12/01	Chaparral Press Release printed from Chaparral Web Site		9/4/01	9/4/01
P-120		CRDS 64625 – CRDS 64626	2/26/01	Chaparral Press Release printed from Chaparral Web Site		9/4/01	9/4/01
P-121		CRDS 64627 – CRDS 64628	3/5/01	Chaparral Press Release printed from Chaparral Web Site		9/4/01	9/4/01
P-122		CRDS 64629 – CRDS 64630	3/22/01	Chaparral Press Release printed from Chaparral Web Site		9/4/01	9/4/01
P-123		CRDS 64631 – CRDS 64632	5/8/01	Chaparral Press Release printed from Chaparral Web Site		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-124		CRDS 64633 – CRDS 64634	6/11/01	Chaparral Press Release printed from Chaparral Web Site		9/4/01	9/4/01
P-125				Crossroads' Annual Report for 2000		9/4/01	9/4/01
P-126	N/A	CNS 000209	1/25/00	Email from Russ Bleakley to Michael Gluck re Crossroads	Relevance; Prejudicial		
P-127	N/A	CNS 024753 – CNS 024754	11/10/99	Memo from Bruce Lambertus to R. Speyer and G. Nagle re FS1310 Feature Enhancement Proposal		9/4/01	9/4/01
P-128	N/A	CNS 023820 – CNS 023824	10/29/99	Memo from Bruce Lambertus to S. Walsh and G. Nagle re FS1310 Feature Enhancement Proposal		9/4/01	9/4/01
P-129	N/A	CNS 187407 – CNS 187427	4/11/01	Purchase and License Agreement between Chaparral and Overland Data, Inc.		9/4/01	9/4/01
P-130	N/A	CRDS 02057 – CRDS 02117	5/12/97	Letter from Alan Leal to Barbara Bardach enclosing OEM License and Purchase Agreement between Hewlett-Packard and Crossroads		9/4/01	9/4/01
P-131	N/A	CRDS 19929 – CRDS 19952	9/18/98	Crossroads Series C Convertible Preferred Stock Purchase Agreement, with Purchasers attached as Schedule A		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-132	Gluck Exh. 63	CNS 029850 – CNS 029871		Chaparral Technologies, Inc., Business Plan Copy #50		9/4/01	9/4/01
P-133	Bianchi Exh. 2	CRDS 64469-CRDS 64470		LUN Management Map Guide		9/4/01	9/4/01
P-134	Bianchi Exh. 3	CRDS 64452-CRDS 64454	1999	Catamaran Device Mapping		9/4/01	9/4/01
P-135	Bianchi Exh. 4	CRDS 64471-CRDS 64474	2000	Common Definition for Global Configuration Data Structures		9/4/01	9/4/01
P-136	Bianchi Exh. 5	CRDS 64493-CRDS 64495	2000	Common Source Code for VPD/Device Mapping and Configuration		9/4/01	9/4/01
P-137	Bianchi Exh. 6		1999	Catamaran Device Mapping		9/4/01	9/4/01
P-138	N/A	CRDS 64620		Catamaran Block Diagram	Hearsay		
P-139	Sims Exh. 12	N/A		Chart showing planned dates for changes in product labelling		9/4/01	9/4/01
P-140	Sims Exh. 13	CRDS 64589		Crossroads Product Label		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-141	Gluck Exh. 55	N/A	3/31/00	Plaintiff Crossroad Systems, (Texas), Inc.'s Original Complaint		9/4/01	9/4/01
P-142	N/A	N/A	9/15/00	Plaintiff Crossroad Systems, (Texas), Inc.'s First Amended Complaint		9/4/01	9/4/01
P-143	N/A	N/A	6/19/00	Crossroads' Preliminary Statement		9/4/01	9/4/01
P-144	N/A	N/A	6/19/00	Chaparral's Preliminary Statement		9/4/01	9/4/01
P-145	N/A	N/A	7/7/00	Declaration of Paul Hodges, Ph.D.	Hearsay; Relevance		
P-146	Zinger Exh. 326	N/A	7/11/00	Crossroads' *Markman* Brief	Hearsay; Relevance		
P-147	Zinger Exh. 327	N/A	7/11/00	Chaparral's *Markman* Brief			
P-148	Selinger Exh. 307/ Stephens Exh. 342	N/A	7/27/00	*Markman* Order	Hearsay; Relevance (except with respect to definitions contained in Order)		
P-149	Gluck Exh. 56	N/A	5/19/00	Chaparral's Complaint Against Crossroads (filed in Colorado and later consolidated with Texas case)	Hearsay; Relevance		
P-150	N/A	N/A	4/17/01	Chaparral's Unopposed Motion for Dismissal (of the Colorado Complaint)	Hearsay; Relevance; Prejudicial		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-151	N/A	N/A	4/20/01	Order Dismissing with Prejudice (3 Claims for Relief brought by Chaparral)	Hearsay; Relevance; Prejudicial		
P-152	N/A	N/A	7/27/01	Chaparral's Motion for Summary Judgment of No Infringement and Brief in Support Thereof, with attached exhibits and declarations	Hearsay; Relevance		
P-153	N/A	N/A	8/10/01	Crossroads' Opposition to Chaparral's Motion for Summary Judgment of No Infringement and Brief in Support Thereof, including all attached exhibits and declarations	Hearsay; Relevance		
P-154	N/A	N/A	8/14/01	Chaparral's Motion for Summary Judgment of Invalidity and Brief in Support Thereof, with attached exhibits and declarations	Hearsay; Relevance		
P-155	N/A	N/A	PENDING	Crossroads' Opposition to Chaparral's Motion for Summary Judgment of Invalidity and Brief in Support Thereof, including all attached exhibits and declarations	Hearsay; Relevance		
P-156	N/A	N/A	8/1/01	Chaparral's 282 Notice	Relevance		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-157	Walker Exh. 69	N/A	6/30/00	Crossroads' First Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-158	Walker Exh. 70	N/A	7/13/00	Crossroads' Second Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-159	Walker Exh. 71	N/A	10/26/00	Crossroads' Third Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-160	Walker Exh. 72	N/A	11/10/00	Crossroads' Fourth Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-161	Walker Exh. 73	N/A	11/22/00	Crossroads' Fifth Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-162		N/A	12/13/00	Crossroads' Sixth Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-163	Permut Exh. 266	N/A	2/14/01	Crossroads' Seventh Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-164	Permut Exh. 267	N/A	6/28/01	Crossroads' Eighth Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-165	Walker Exh. 338	N/A	7/23/01	Crossroads' Ninth Notice of 30(b)(6) Deposition to Chaparral	Relevance		
P-166	Walker Exh. 74	N/A	10/17/00	Crossroads' First Notice of 30(b)(6) Deposition to Chaparral (in the Colorado Case)	Relevance		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-167	N/A	N/A	7/26/00	Chaparral's Original Responses to Crossroads' First Set of Interrogatories (Nos. 1 – 5)	Relevance		
P-168	N/A	N/A	1/5/01	Chaparral's Original Responses to Crossroads' Second Set of Interrogatories (No. 6 – 14)	Relevance		Excluded
P-169	N/A	N/A	7/18/01	Chaparral's Original Responses to Crossroads' Fourth Set of Interrogatories (Nos. 15 – 21)	Relevance		
P-170	N/A	N/A	Pending	Chaparral's Original Responses to Crossroads' Fifth Set of Interrogatories (Nos. 21 – 25)	Relevance		
P-171	N/A	N/A	7/17/01	Chaparral's Supplemental Answers to Crossroads' Interrogatory Nos. 1 –5 and 14	Relevance		
P-172	N/A	N/A	7/26/01	Chaparral's Supplemental Answers to Crossroads' Interrogatory Nos. 2 and 3	Relevance		
P-173	N/A	N/A	8/2/01	Chaparral's Responses to Crossroads' First Set of Requests for Admission (Nos. 1 – 25)	Relevance		
P-174	N/A	N/A	7/26/00	Crossroads' Responses to Chaparral's First Set of Interrogatories (Nos. 1 – 6)	Relevance		Excluded

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-175	N/A	N/A	1/5/01	Crossroads' Responses to Chaparral's Second Set of Interrogatories (No. 7)	Relevance		
P-176	N/A	N/A	1/5/01	Crossroads' Responses to Chaparral's First Set of Requests for Admission (Nos. 1 – 19)	Relevance		
P-177	N/A	N/A	5/9/01	Crossroads' Supplemental Response to Chaparral's First Set of Interrogatories (No. 3 only)	Relevance		Excluded
P-178	N/A	N/A	7/6/01	Crossroads' Second Supplemental Response to Chaparral's First Set of Interrogatories (No. 3 only)	Relevance		
P-179	N/A	N/A	7/31/01	Crossroads' Responses to Chaparral's Second Set of Requests for Admissions (Nos. 20 – 23)	Relevance		
P-180		N/A	8/17/01	Expert Report of Paul Hodges, Ph.D.	Hearsay		
P-181	Attachment 1 to Hodges Expert Report	N/A	8/17/01	Paul Hodges' Biography	Hearsay		
P-182	Attachment 2 to Hodges Expert Report	N/A	8/17/01	U. S. Patent No. 5,941,972		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-183	Attachment 3A to Hodges Expert Report	CRDS 64444	2/13/01	Data CD containing snapshot of Chaparral Web Site	Relevance; Prejudicial; Rule 408 (any mention of settlement)		
P-184	Attachment 3B to Hodges Expert Report	CRDS 64445	5/22/01	Data CD containing snapshot of Chaparral Web Site	Relevance; Prejudicial; Rule 408 (any mention of settlement)		
P-185	Attachment 3C to Hodges Expert Report	CRDS 64446	6/14/01	Data CD containing snapshot of Chaparral Web Site	Relevance; Prejudicial; Rule 408 (any mention of settlement)		
P-186	Attachment 4 to Hodges Expert Report	N/A	7/27/00	*Markman* Order	Hearsay; Relevance (except with respect to definitions contained in Order)		
P-187	Attachment 5 to Hodges Expert Report	N/A	8/17/01	Photographs of RAID Controller (K7413)	Hearsay	9/6/01	9/6/01
P-188	Attachment 6 to Hodges Expert Report	N/A	8/17/01	Screen Shots From RAID Controller Admin (Menu Tree)/Test 1	Hearsay	9/6/01	9/6/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-189	Attachment 7 to Hodges Expert Report	N/A	8/17/01	Screen Shots From RAID Controller Admin and Host Computers/Test 2	Hearsay	9/6/01	9/6/01
P-190	Attachment 8 to Hodges Expert Report	N/A	8/17/01	Screen Shots From RAID Controller Admin and Host Computers/Test 3	Hearsay	9/6/01	9/6/01
P-191	Attachment 9 to Hodges Expert Report	N/A	8/17/01	Data From RAID Controller Reboot	Hearsay	9/6/01	9/6/01
P-192	Attachment 10 to Hodges Expert Report	N/A	8/17/01	Data from "scu.exe"	Hearsay	9/6/01	9/6/01
P-193	Attachment 11 to Hodges Expert Report	N/A	8/17/01	Performance Tests	Hearsay		
P-194			8/24/01	Rebuttal Report of Paul Hodges, Ph.D., with attachments	Hearsay; Relevance		
P-195			8/10/01	Declaration of Paul Hodges, Ph.D. in support of Crossroads' Opposition to Defendant Chaparral's Motion for Summary Judgment of No Infringement	Hearsay; Relevance		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-196		N/A	8/17/01	Expert Report of Gary R. Stephens, including all documents cited therein			
P-197		N/A	8/24/01	Rebuttal Report of Gary R. Stephens, including all documents cited therein			
P-198	Davies Exh. 331	N/A	7/27/01	Declaration of Ian Robert Davies in Support of Chaparral's Motion for No Infringement			
P-199	Davies Exh. 332	N/A	7/27/01	Declaration of Ian Robert Davies in Support of Chaparral's Motion for No Infringement, with attached Exhibits A – F			
P-200	Davies Exh. 333	CRDS 64432 – CRDS 64441		LUN Zoning for the FS2620 Router User's Guide		9/4/01	9/4/01
P-201	Walker Exh. 339	CNS 185195 – CNS 185208		A8526 External Rack RAID Controller User's Guide		9/4/01	9/4/01
P-202	Stephens Exh. 335	CNS 187024		Photocopy of a CD ROM cover: DATA CD R For Computer Writers		9/4/01	9/4/01
P-203	Stephens Exh. 336	CNS 187025		Screen shot	Hearsay		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-204	Stephens Exh. 337	CNS 187026 – CNS 187122		Chaparral A8526 Testing Performed by FSI Consulting Services, 7/10/01 – 7/21/01	Hearsay		
P-205	Stephens Exh. 338	CNS 187123 – CNS 187219		Chaparral A8526 Testing Performed by FSI Consulting Services, 7/10/01 – 7/21/01	Hearsay		
P-206	Stephens Exh. 339	CNS 187220 – CNS 187298		Chaparral A8526 Testing Performed by FSI Consulting Services, 7/10/01 – 7/??/01	Hearsay		
P-207	Stephens Exh. 340	CNS 187299 – CNS 187388		Chaparral A8526 Testing Performed by FSI Consulting Services, 7/10/01 – 7/??/01	Hearsay		
P-208	Stephens Exh. 341	CNS 187389 – CNS 187406		Chaparral A8526 Testing Performed by FSI Consulting Services, 7/10/01 – 7/21/01	Hearsay		
P-209	N/A	N/A	5/25/01	CD ROM of the Crossroads Web Site	Relevance; Prejudicial; Rule 408 (any mention of settlement)		
P-210	N/A	N/A		Crossroads CP 4100 Product, including all hardware and software necessary to make it functional	Relevance; Prejudicial		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-211	N/A	N/A		Crossroads CP 4400 Product, including all hardware and software necessary to make it functional	Relevance; Prejudicial		
P-212	Arroyo Exh. 3	N/A	Undated	Printout of Arroyo's floppy drive disc drive directory	Hearsay		
P-213	Arroyo Exh. 4	CRDS 63362 – CRDS 63363	Undated	Notes written by witness into computer file	Hearsay		
P-214	Arroyo Exh. 5	CRDS 63301 – CRDS 63331	1996	Bridge.c code, copyright 1995, revised 1996		9/4/01	9/4/01
P-215	Arroyo Exh. 6	CRDS 63364 – CRDS 63440	1996	Bridge.c code, copyright 1995, revised 1996		9/4/01	9/4/01
P-216	Arroyo Exh. 7	CRDS 63498 – CRDS 63574	1996	Bridge.c code, copyright 1995, revised 1996		9/4/01	9/4/01
P-217	Arroyo Exh. 8	CRDS 63441 – CRDS 63497	3/19/97	Bridge.c code, further revised, 3/19/97		9/4/01	9/4/01
P-218	Arroyo Exh. 9	CRDS 63127.9729 G.1 – CRDS 63127.9729 G.107	9/18/97	Bridge.c code, further revised, 9/18/97		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-219	Permut Exh. 233	CNS 184737 – CNS 184948	Jan. 2001	CAPI Functional Specification Version 3.1, January 2001		9/4/01	9/4/01
P-220	Permut Exh. 234	CNS 184949 – CNS 185046		Chaparral FS2620R User's Guide		9/4/01	9/4/01
P-221	Permut Exh. 235	CNS 185047 – CNS 185048		Chaparral FS2620 marketing matrix		9/4/01	9/4/01
P-222	Permut Exh. 236	CNS 185049 – CNS 185064		Quick Start Guide for rack mount products		9/4/01	9/4/01
P-223	Permut Exh. 237	CNS 185065 – CNS 185073		Chaparral SNMP MIB Capabilities		9/4/01	9/4/01
P-224	Permut Exh. 238	CNS 185074 – CNS 185167		Chaparral FS1310 User's Guide		9/4/01	9/4/01
P-225	Permut Exh. 239	CNS 185195 – CNS 185376		A8526 User's Guide		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-226	Permut Exh. 240	CNS 185377 – CNS 185378		A-Series External RAID Controller marketing matrix		9/4/01	9/4/01
P-227	Permut Exh. 241	CNS 185404 – CNS 185593		G6322/G7324/G8324 User's Guide		9/4/01	9/4/01
P-228	Permut Exh. 242	CNS 185594 – CNS 185595		G8324 External RAID Controller marketing matrix		9/4/01	9/4/01
P-229	Permut Exh. 243	CNS 185598 – CNS 185599		G-Series External RAID Controllers marketing matrix		9/4/01	9/4/01
P-230	Permut Exh. 244	CNS 185600 – CNS 185767		K5412/K7413 User's Guide		9/4/01	9/4/01
P-231	Permut Exh. 245	CNS 185768 – CNS 185769		K-Series External RAID Controllers marketing matrix		9/4/01	9/4/01
P-232	Permut Exh. 246	CNS 185770 – CNS 185927		G- and K-Series User's Guide		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-233	Permut Exh. 247	CNS 185928 – CNS 185929		G-Series External RAID Controllers marketing matrix		9/4/01	9/4/01
P-234	Permut Exh. 248	CNS 184733 – CNS 184734		RAID and Router Product Overviews		9/4/01	9/4/01
P-235	Permut Exh. 249	N/A		Chart of RAID and router products		9/4/01	9/4/01
P-236	Permut Exh. 250	CNS 186488 – CNS 186514		Rainrock Hardware Platform K5412, K7413, FS1310 Engineering Requirements Document		9/4/01	9/4/01
P-237	Permut Exh. 251	CNS 186429 – CNS 186455		K5312/K7313 Board-Only Design In Guide		9/4/01	9/4/01
P-238	Permut Exh. 252	CNS 186314 – CNS 186338		Skyway II/Goldengate II Hardware Design Specification		9/4/01	9/4/01
P-239	Permut Exh. 253	CNS 186578 – CNS 186587		Dual Loop Fibre Channel Daughterboards Hardware Design Specification		9/4/01	9/4/01
P-240	Permut Exh. 254	CNS 186726 – CNS 186728		Memorandum to Pat Foose from Victor Pecone		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-241	Permut Exh. 255	CNS 186943 – CNS 186950		Rack Mount RAID Product Review		9/4/01	9/4/01
P-242	Permut Exh. 256	CNS 186984 – CNS 187002	1/21/00	G6322G7324 Product Presentation		9/4/01	9/4/01
P-243	Permut Exh. 257	CNS 172224.1	3/23/00	Mainboard Block Diagram, FS2620R		9/4/01	9/4/01
P-244	Permut Exh. 258	CNS 162205.192		FS2424/FS2430 Block Diagram		9/4/01	9/4/01
P-245	Permut Exh. 259	CNS 185939 – CNS 185943	2/09/01	Engineering Change Notice A400 SW on A8526		9/4/01	9/4/01
P-246	Permut Exh. 260	CNS 185948 – CNS 185961		Engineering Change Notice G-Series Maintenance Upgrade vG400		9/4/01	9/4/01
P-247	Permut Exh. 261	CNS 185980 – CNS 186000	11/29/00	Engineering Change Notice G2-Series Maintenance Upgrade vL400		9/4/01	9/4/01
P-248	Permut Exh. 262	CNS 185962 – CNS 185978		Engineering Change Notice K-Series vK410		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-249	Permut Exh. 263	CNS 186544 – CNS 186551	6/04/01	Skyway II RAID Software Release 4.0 Incremental Engineering Requirements		9/4/01	9/4/01
P-250	Permut Exh. 264	CNS 186686 – CNS 186702	10/06/00	A8526 RAID Controller Marketing Requirements Document		9/4/01	9/4/01
P-251	Permut Exh. 265	CNS 186951 – CNS 186967	8/23/01	G8526 V1.0 Functional Specification		9/4/01	9/4/01
P-252	Permut Exh. 268	CNS 186001 – CNS 186005		Engineering Change Notice, Forward Router Code vR430		9/4/01	9/4/01
P-253	Permut Exh. 269	CNS 186537 – CNS 186543		G/K RAID Software, Software Release 4.0 Incremental Engineering Software		9/4/01	9/4/01
P-254	Permut Exh. 270	CNS 186295 – CNS 186313		Skyway II RAID Software, Software Release 4.0, Engineering Requirements		9/4/01	9/4/01
P-255	Permut Exh. 271	N/A		Chaparral Screen Shots	Hearsay		
P-256	Permut Exh. 272	CNS 186145 – CNS 186161		Skyway Software Design, Revision 0.2		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-257	Permut Exh. 273	CNS 186162 – CNS 186169		Code descriptions		9/4/01	9/4/01
P-258	Permut Exh. 274	CNS 184735- CNS 184736		1.1 Pass Through Commands		9/4/01	9/4/01
P-259	Permut Exh. 151	CNS 0162205.476 – CNS 0162205.626		CAPI Functional Specification v2.8		9/4/01	9/4/01
P-260	Permut Exh. 154	CNS 0165205.782 – CNS 0165205.964	3/21/00	CAPI Functional Specification v3.0 dated 3/21/00		9/4/01	9/4/01
P-261		CRDS 64635		CAPI Functional Specification v3.2		9/4/01	9/4/01
P-262	N/A	CRDS 50579	9/3/97	Drawing of the Verrazano placement Bare Board and Bare Board	Hearsay; Relevance		
P-263	Hoese Exh. 12	CRDS 41182- CRDS 41260		Hoese notebook.	Relevance; incomplete	9/11/01	9/11/01
P-264	N/A	CRDS 14926 – CRDS 14935	6/5/97	Verrazano Enclosure Specification, Revision 2.1	Relevance; incomplete	9/5/01	9/5/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-265	N/A	CRDS 16189	7/7/97	Email from Geoffrey B. Hoese to Crossroads regarding Verrazano Release 1	Relevance; Hearsay		
P-266	N/A	CRDS 41920- CRDS 41952	7/11/97	Letter from Anthony Peterman to Geoff Hoese regarding US Patent entitled Storage Router and Method for Providing Virtual Local Storage; patent application	Relevance; authentication	9/11/01	9/11/01
P-267	Russell Exh. 10	CRDS 43928 – CRDS 43982	9/5/97	CP4x00 Product Specification	Relevance; incomplete	9/5/01	9/5/01
P-268	Russell Exh. 2	CRDS 16392 – CRDS 16423	8/25/97	Verrazano Hardware Architecture, Revision 1.0	Relevance; incomplete	9/5/01	9/5/01
P-269	N/A	CRDS 16425 – CRDS 16444	8/27/97	Verrazano Software Architecture, Revision 1.1	Relevance; incomplete		
P-270	N/A	CRDS 50585; CRDS 50616	9/3/97	Excerpts from the Verrazano System Structure	Hearsay; Relevance		
P-271	N/A	CRDS 50452 – CRDS 50459	9/5/97	Verrazano Programmable Device Instructions, Version 1.1	Hearsay; Relevance		

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-272	N/A	CRDS 43605-CRDS 43694 (mixed pages)	9/29/97	Component and Insertion Lists for Verrazano	Hearsay; Relevance		
P-273	Russell Exh. 9	CRDS 40258 – CRDS 40288	10/13/97	CP4100 Power Point Slides	Hearsay; Relevance		
P-274	Hoese Exh. 14	CRDS 41321 – CRDS 41426		Geoff Hoese Laboratory Notebook	Relevance; incomplete	9/11/01	9/11/01
P-275	N/A	CRDS 41887-CRDS 41919	12/31/97	Letter to Dale Quisenberry from William N. Hulsey III regarding Patent Application entitled "Storage Router and Method for Providing Virtual Local Storage"; draft application	Relevance; authentication	9/11/01	9/11/01
P-276	N/A	CRDS 41830 -- CRDS 41859		Patent application for a Storage Router and Method for Providing Virtual Local Storage	Relevance; authentication	9/11/01	9/11/01
P-277	Walker Exh. 140		4/19/00	4/19/00 Memo from Nigel Squibb to Michael Gluck with attachments	Hearsay; Relevance		
P-278		CRDS 64635		CAPI 3.2 Software Development Kit		9/4/01	9/4/01

TRIAL EX. NO.	DEPO EX. NO.	BATES RANGE	DATE	DESCRIPTION	OBJECTIONS	OFFERED	ADMITTED
P-279	Russell Exh. 5	CRDS 39575 – CRDS 39698	12/95 – 11/99	Jeff Russell Lab Notebook			
P-532				Demonstrative	Objection Overruled	9/6/01	9/6/01
P-508				Demonstrative	Objection Overruled	9/6/01	9/6/01
P-509				Demonstrative	Objection Overruled	9/6/01	9/6/01
P-530				Demonstrative	Objection Overruled	9/6/01	9/6/01
P-608				Demonstrative		9/10/01	9/10/01
P-609				Demonstrative		9/10/01	9/10/01
P-610				Demonstrative		9/10/01	9/10/01
P-611				Demonstrative		9/10/01	9/10/01
P-612				Demonstrative		9/10/01	9/10/01
P-613				Demonstrative		9/10/01	9/10/01
P-614				Demonstrative		9/10/01	9/10/01
P-615				Demonstrative		9/10/01	9/10/01

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document was served via pdf on this __ day of September, 2001.

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Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	3	@ad<"20010927" and (fibre adj channel near router) same SCSI	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 08:44
S2	0	@ad<"19971231" and (fibre adj channel near router) same SCSI	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 08:44
S3	111	@ad<"19971231" and fibre adj channel same SCSI	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 08:45
S4	35	@ad<"19971231" and fibre adj channel near SCSI	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 08:46
S5	1	S4 and router	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 08:45
S6	7	@ad<"19971231" and fibre adj channel adj SCSI	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:02
S7	0	@ad<"19971231" and "fibre channel protocol for SCSI"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:02
S8	14	@ad<"19971231" and FCP and SCSI and fibre adj channel	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:07
S10	1	S8 and router	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:03

S11	3	S8 and RAID	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:18
S13	39	@ad<"20010927" and network adj attached adj storage and Fibre adj channel near scsi	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:19
S14	19	S13 and router	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:19
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S14	19	S13 and router	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/22 09:19
S15	0	@ad<"19971231" and network adj attached adj storage and Fibre adj channel near scsi	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/09/03 14:23
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S23	139	@ad<"19971231" and fibre adj channel and SCSI	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/30 14:48
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S26	11	S24 and LUN	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/30 14:23
S27	0	S24 and virtual near local near storage	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/30 14:22
S28	0	S23 and virtual near local near storage	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/08/30 14:22
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S37	1	"6425035".pn. and remote and map and maps and mapping and native	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/09/05 18:55

Search Notes	Application No. 90/007,124	Applicant(s) 6421753
	Examiner Fritz M Fleming	Art Unit 2182

SEARCHED			
Class	Subclass	Date	Examiner
710	129, 1-5, 8-13, ~~36-38~~, 100-101, 105, ~~126-131~~	1/21/05	RJR
714	42		
711	100, 112, 113		
710	305-316		
update		9/16/05	ASC

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
updated see search history printouts			ASC

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
EAST NOTES ENCLOSED	1/21/05	RJR
NPL search: SCSI, FC, Fibre Channel, Storage, block level, native, ATM		
updated IEEE xplore, Google Scholar Fibre Channel, native, SCSI	9/16/05	ASC

64660 U.S. PTO 07/22/05

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE		
CERTIFICATE OF SERVICE UNDER 37 C.F.R. 1.248		Atty. Docket No. **CROSS1121-15**
	Applicant **Geoffrey B. Hoese, et al.**	
	Reexamination Control No. **90/007,124**	Date Filed **07/19/2004**
	Title **Storage Router and Method for Providing Virtual Local Storage**	
	Group Art Unit **2182**	Examiner **Fleming, Fritz**

Applicant hereby serves the Reply to Office Action Under *Ex Parte* Reexamination Dated 05/24/05 in the above referenced case to:

Larry E. Severin
Wang, Hartmann & Gibbs, PC
1301 Dove Street, #1050
Newport Beach, CA 92660

As per 35 U.S.C. §1.248 service is made via first class mail on July 22, 2005.

Respectfully submitted,

Sprinkle IP Law Group

John L. Adair
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Dated: July 22, 2005

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Enclosures

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
REPLY TO OFFICE ACTION UNDER *EX PARTE* REEXAMINATION DATED 05/24/05	Atty. Docket No. **CROSS1121-15**

Applicants **Geoffrey B. Hoese, et al.**	
Reexamination Control No. **90/007,124**	Date Filed **07/19/2004**
Title **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **2182**	Examiner **Fleming, Fritz**
Confirmation Number: **2295**	Patent No. **6,421,753**

Certificate of Mailing Under 37 C.F.R. §1.10

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail No. **EV734539460US** in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22312-1450 on July 22, 2005.

Julie A Blackard

Signature

JULIE H. BLACKARD

Printed Name

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

In response to the Official Action mailed May 24, 2005 (the "May 24 Office Action"), Applicant respectfully requests the Examiner reconsider the rejections of the Claims in the Re-Examination of U.S. Patent 6,421,753 (the "'753 Patent") in view of this reply.

IN THE CLAIMS:

1. A data storage gateway capable of interfacing with and providing connectivity and mapping between a Fiber Channel and SCSI channel interface, the data storage gateway comprising:

a virtual storage;

a storage router in communication with and providing mapping to the virtual storage such that a fiber channel device remote from the virtual storage can communicate data to and from the virtual storage; and

wherein the storage router is capable of configuring a SCSI device to contain at least a portion of the virtual storage.

2. The data storage gateway according to Claim 1, further including a memory work space for the storage router using a buffer.

3. The data storage gateway according to Claim 2 wherein a Fibre Channel transport medium connects to the storage router and interfaces with a Fibre Channel controller and wherein a SCSI bus transport medium connects to the storage router and interfaces with a SCSI controller.

4. A method for providing, through a storage router, virtual local storage on remote SCSI storage devices to Fibre Channel devices, comprising:

interfacing with a Fibre Channel transport medium;

interfacing with a SCSI bus transport medium;

maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices; and

allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration.

5. The method of Claim 4, further comprising the step of providing memory work space for the storage router using a buffer.

6. The method of Claim 5, wherein the Fibre Channel transport medium connects to and interfaces with a Fibre Channel controller and wherein said SCSI bus transport medium connects to and interfaces with a SCSI controller.

7. The method of Claim 5, wherein the maintaining step and the allowing step are performed by a supervisor unit.

8. The method of Claim 7, wherein the supervisor unit is coupled to the Fibre Channel controller, the SCSI controller, and the buffer.

TABLE OF CONTENTS FOR RESPONSE TO REJECTIONS

2. Neither Spring nor Oeda Teaches or Suggests a Map

F. "Access Controls" – Neither Spring nor Oeda Teaches or Suggests Implementing Access Controls

1. Implementing Access Controls

2. Spring Does Not Implement Access Controls

3. Oeda Does Not Teach or Suggest Access Controls

4. The Ethernet Based Configuration of Oeda Does Not Teach or Suggest Any Form of Access Controls for Remote Storage

G. The Combination of Oeda and Spring Does Not Teach or Suggest the Present Invention

H. The Jibbe Reference Does Not Address the Deficiencies of Spring and Oeda

H. The Cummings Reference Does Not Address the Deficiencies of Spring and Oeda

J. Summary: There is No *Prima Facie* Case of Obviousness

II. Conclusion

I. Rejections Under 35 U.S.C. §103

A. Introduction

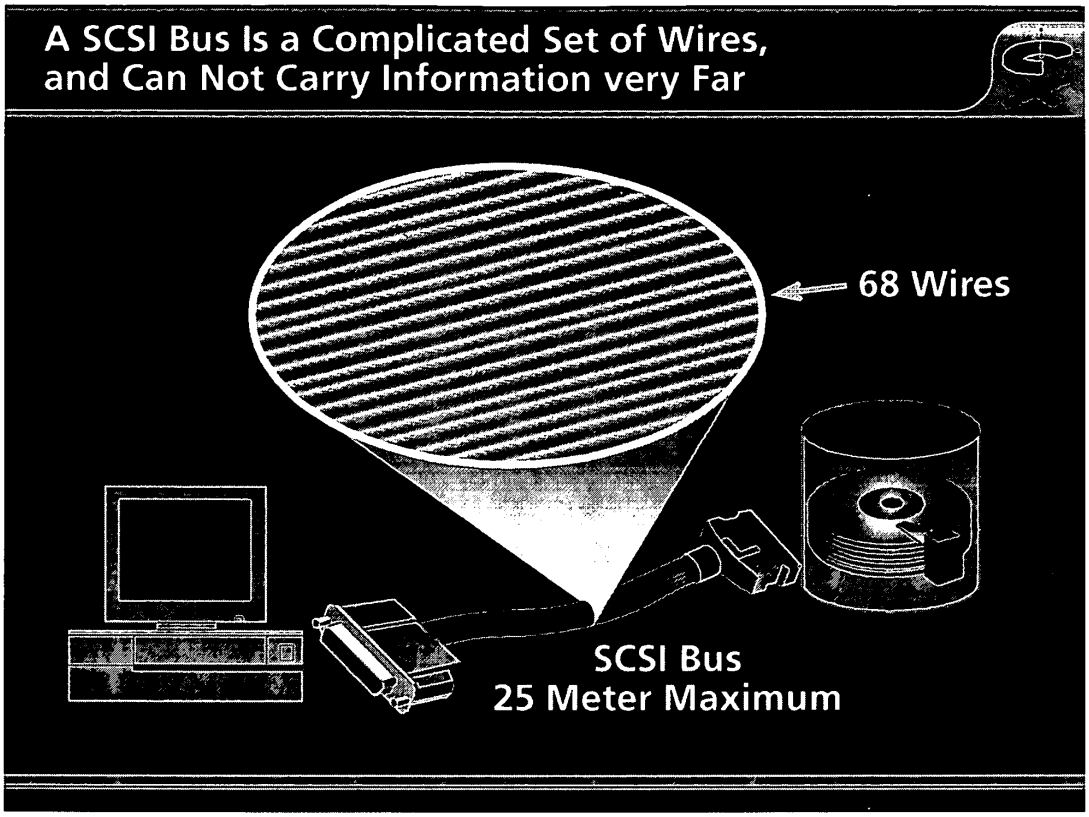
Claims 1-8 of the '753 Patent are variously rejected under 35 U.S.C. §103(a) as being unpatentable over United Kingdom Patent Application Publication No. UK GB 2297636 ("Spring") in view of United States Patent No. (5,634,111) ("Oeda"), United States Patent No. 5,345,565 ("Jibbe"), and further in view of Cummings.

In order to establish a prima facie case of obviousness, the Examiner must show: that the prior art references teach or suggest all of the claim limitations; that there is some suggestion or motivation in the references (or within the knowledge of one of ordinary skill in the art) to modify or combine the references; and that there is a reasonable expectation of success. M.P.E.P. 2142, 2143; In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). As detailed more fully below, Applicants respectfully submit that independent Claim 1 and independent Claim 4 of the '753 Patent are not rendered obvious by Spring, Oeda or Cummings as the references do not teach or suggest all of the claim limitations. More particularly, the references do not teach or suggest, neither individually or in combination: i) providing virtual local storage on remote storage devices and allowing access from devices connected to a first transport medium to the remote storage using native low level block protocols (NLLBP) in conjunction with; ii) mapping between devices connected to the first transport medium and the storage devices; and in conjunction with iii) implementing access controls. None of the prior art, alone or in combination, teaches or suggests all of these claimed elements.

B. Background of the Invention

The '753 Patent is directed to an efficient storage router and method of routing data over a network from devices (e.g., host computers) on one side of the storage router to remote storage devices on the other side of the storage router using low level, block storage protocols or NLLBPs. Even though the storage devices are located remotely over the network from the host computers, the storage devices are virtualized so as to appear to the host computer as locally-attached storage devices. The invention of the '753 Patent further provides the security feature of providing access controls in order to control which storage devices (or portions thereof) any particular host computer can access; this access controls feature is implemented by mapping host devices to the remote storage devices to which a host device has access. By allowing a host device access only to those virtualized storage devices (or portions of storage devices) to which it is mapped, the invention of the '753 Patent can prevent unauthorized or unintended access by that host device to other remote storage devices in the network. Thus, the present invention provides a networked storage solution that connects hosts to remotely attached storage devices that <u>appear</u> locally attached, provides the security feature of controlling access to the remote storage devices using a map, and allows the host computers to access the remote storage devices over the network at the speeds and efficiencies facilitated by the use of NLLBPs.

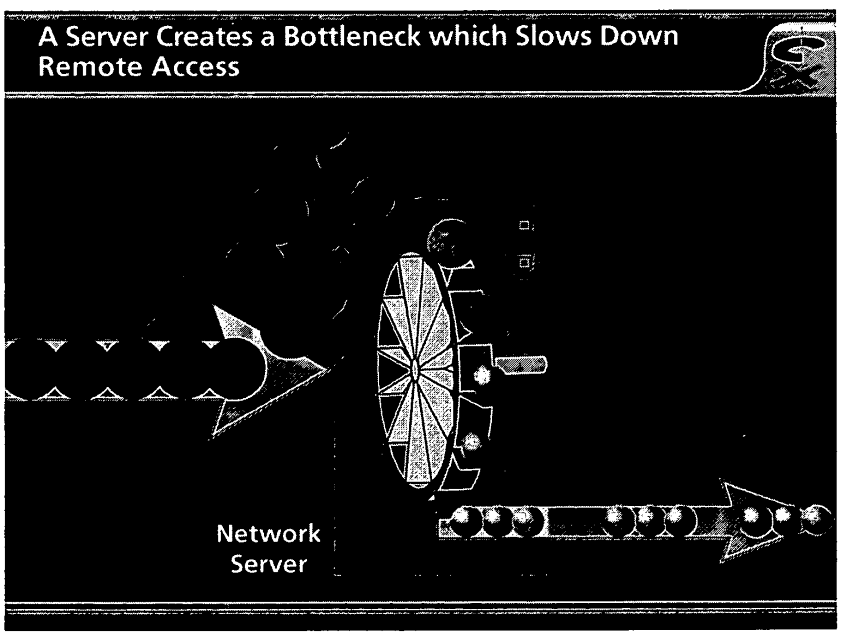
As shown in the examples discussed in the Spring and Oeda prior art (discussed more fully below), prior to the present invention, host computers would access storage devices either i) locally via a parallel bus such as a SCSI bus or ii) remotely over a network using network protocols. However, both of these prior art systems had limitations that the invention of the '035 Patent overcomes. For storage systems with locally attached storage devices attached via SCSI buses, a SCSI-to-SCSI routing device provided access between host computers on one side of the SCSI-SCSI routing device to local storage on the other side of the SCSI-SCSI routing device. Because a SCSI bus was used on each side of the SCSI-to-SCSI routing device, a computer could access a storage device using a NLLBP, which facilitates the obtaining of information from the storage device in a fast and efficient manner (i.e., without the overhead associated with typical network file servers). However, a SCSI bus is a complicated set of parallel wires that cannot carry data a very long distance. This limitation is illustrated in Graphic 1 below. Note that color copies of Graphics 1-5 are attached in Exhibit A for the convenience of the Examiner.



Graphic 1

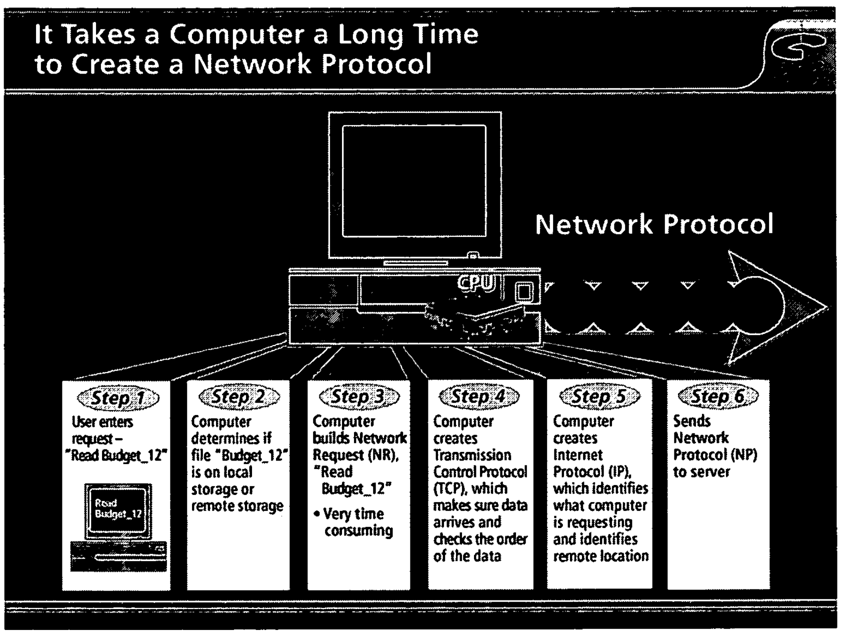
Thus, a major shortcoming of any such SCSI-to-SCSI routing device or method was that the storage devices must typically be within approximately 25 meters of the host computer that needs to have access to the storage devices. Indeed, due to the costs associated with these complicated SCSI buses, most SCSI buses were significantly shorter (typically less than 12 meters) in actual installations. As the '753 Patent states "typical storage transport mediums provide for a relatively small number of devices to be attached over relatively short distances." *See,* '753 Patent, col. 1, lines 19-21.

Modern computer storage systems, however, need networks connecting multiple computers to each other and to remote storage locations that are significantly distant from the host computers that access the remote storage. As discussed above, this is not possible with a SCSI bus because of the distance limitation of the SCSI bus. In typical prior art systems (including those of Spring and Oeda as will be discussed below), to overcome the inability of a SCSI-to-SCSI system to provide remote storage (as discussed an NLLBP cannot be sent a long distance over a SCSI bus), workstations were connected to a network server using a distance-capable network transport medium and a network protocol such as Ethernet. *See*, '753 Patent Background, col. 1, lines 43-53. A problem with this prior art solution was that the network server creates a bottleneck which slows down remote access because, at least in part, the computer or workstation needs to create something called a "network protocol" to send the data over the distance-capable transport medium. The problem with this prior art method for transmitting a storage NLLBP over a network to a remote storage device is that it takes the computer time to create a network protocol and it takes the server time to re-construct a native low level block protocol from that network protocol. Thus, the introduction of a network server into the system creates a bottleneck which slows down access to remote storage devices. Graphic 2, shown below, depicts one aspect of that bottleneck with the large balls intended to depict network protocols and the smaller balls intended to depict native low level block protocols. Although Graphic 2 only graphically depicts the problems in one direction (from the host computer through the server to the remote storage devices), the problems exist going both directions. In other words, the same type of bottleneck occurs in reverse when the data returns to the computer from the remote storage device through the server.



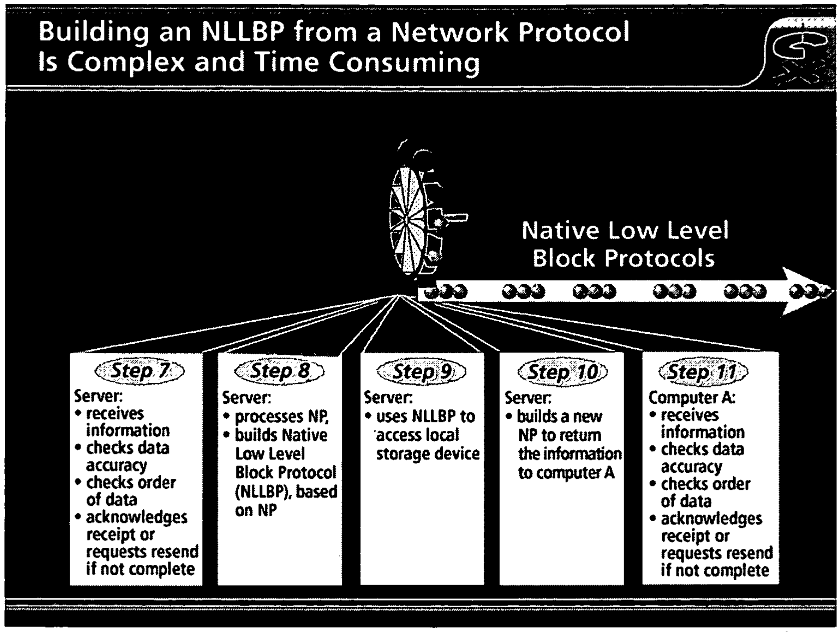
Graphic 2

As shown in Graphic 2, for prior art systems that provided hosts access to remote storage, a workstation first had to translate requests into higher level network protocols in order to communicate with the network server, and the network server would then translate the requests into low level requests (e.g., NLLBPs) for transmitting to the storage device(s). It takes a computer a long time to create a network protocol. Graphic 3, shown below, describes in general terms steps involved when a computer needs to access remote storage through a server, and has to create a network protocol to achieve that access. Similar steps occur when the computer wants to write data to the remote storage device.



Graphic 3

As illustrated in Graphic 4 below, the process the server goes through to build a NLLBP from a network protocol is also complex and time consuming. Graphic 4 describes in general terms steps involved in building a native low level block protocol from a network protocol. The native low level block protocol is then used to access a local storage device. The return of the data from the remote storage device to the host computer also involves the same complex steps. On the return path, the server needs to build a network protocol from the NLLBP it receives from the storage device. In addition, the computer needs to process that the network protocol to get the information by essentially repeating the steps shown in Graphic 3 above in reverse.



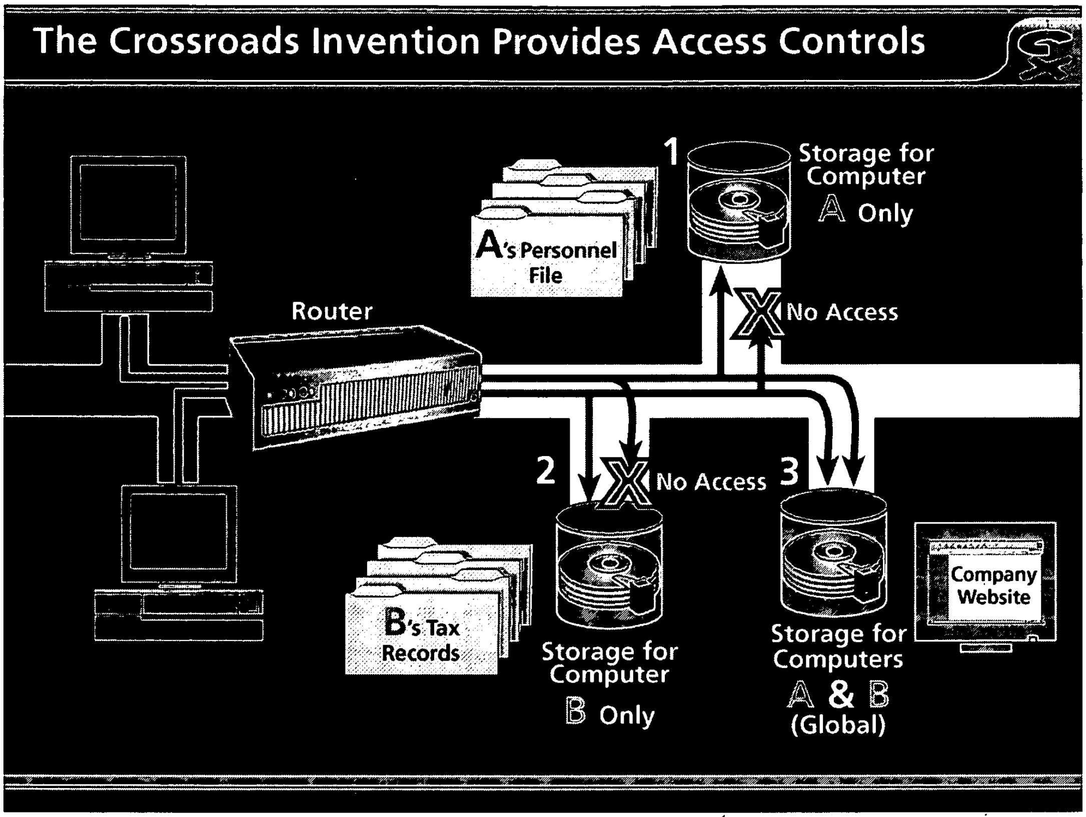
Graphic 4

Thus, prior to the present invention, those wishing to implement centralized storage at a remote location for networked devices were typically forced to use a relatively slow network server solution that required the use of higher level network protocols. These prior art systems did not provide remote storage that could be accessed at the speeds achieved by using an NLLBP from the hosts to the storage devices.

The present invention overcomes the deficiencies of these prior art systems allowing hosts to access remote storage devices at significantly distant, remote locations using a NLLBP. The use of the Fibre Channel protocol, for example, allows storage devices to be located in excess of 10 kilometers away from the workstations using a serial transport medium as opposed to the parallel transport medium of a SCSI bus. However, unlike an Ethernet file server system, a storage router connected using a Fibre Channel transport medium can allow access from the host computer to the remote storage devices using NLLBPs without having to create higher level network protocols. Because Fibre Channel supports the use of NLLBPs, the hosts can access the remote storage devices at greater speeds than can be achieved using higher-level network protocols. The present invention thus routes NLLBPs to the remote storage devices without involving a network server that requires the use of higher-level network protocols. This allows remote storage, but does away with the time consuming and complex steps of creating and processing higher-level network protocols at a server. Consequently, both distance and speed can be achieved, without sacrificing one for the other as required by prior art solutions.

In addition to providing the ability to locate host computers remotely at significant distances from storage devices, modern storage systems need to provide security between the host computers and the remote storage. In addition, since the host computers are remotely located physically from the storage devices, it is advantageous to provide this security in a centralized manner. In other words, it is desirable to provide a centralized control mechanism that controls each host computer's access so that each host can only access particular remote storage devices (or portions thereof). In prior art systems, the ability to provide such a security mechanism in a networked system connecting hosts to remote storage devices using NLLBPs without simply did not exist.

In addition to providing hosts access to remote storage devices over a network using NLLBPs, the invention of the '753 Patent provides such a security feature. The invention of the '753 Patent contains a map that maps the host computers to the remote storage devices by associating each host computer with some or all of the remote storage devices on the other side of the storage router. The invention of the '753 Patent implements access controls by using the map to allow each host access to only the specific storage to which the host is mapped. In this manner, the invention of the '753 Patent implements access controls to limit each computer's access to a specific subset of storage devices or sections of a storage device on the other side of the storage router. Put another way, the access controls provide the capability to permit or deny each computer access to a particular storage device, a set of storage devices or portions of a single storage device or devices (or any combination thereof). By assigning storage devices or portions thereof to particular computer workstations, the present invention prevents each computer workstations from overwriting or modifying data in storage assigned to another computer workstation. This access controls feature is illustrated below in Graphic 5.



Graphic 5

For the example of Graphic 5, host computer A is mapped to remote storage device 1, host computer B is mapped to remote storage device B and both A and B are mapped to remote storage device 3. Using this map, the invention of the '753 implements access controls by allowing host computer A to access either remote storage device 1 or 3 (e.g., allow host computer A to read or write data to or from storage devices 1 or 3) and by preventing host computer A from accessing remote storage device 2 (e.g., only allowing host computer B to read or write data to storage device 2 in the example of Graphic 5). By mapping between host devices and storage devices (or portions thereof), the invention of the '753 Patent can ensure that requests from host computer A are only directed to the storage devices that are assigned to computer A. This allows the security feature of access controls to be implemented while still allowing the host computers to access the storage devices using an NLLBP.

In summary, the invention of the '753 Patent provides a networked storage solution that combines the ability to allow access from host computers to remote storage devices using

NLLBPs with the ability to control access between host computers and the remote storage devices. Thus, the invention of the '753 Patent provides the advantages of 1) remote storage devices that appear to the host as locally attached, but that actually reside at remote distances from the host computers, 2) access to these remote storage devices at the speed and efficiency associated with using NLLBPs, and 3) data security by controlling the access of each host to the remote storage. None of the prior art cited by the Examiner, alone or in combination, teaches or suggests a system that provides access from host computers (or other device connected to the first transport medium) to remote storage devices using an NLLBP, while implementing access controls in accordance with a map.

C. Overview of Claim 4

The Examiner rejected independent Claim 4 as being unpatentable over Spring in view of Oeda. Applicants will focus on Claim 4 in discussing how the present invention differs from the cited art.

Claim 4 recites:

> A method for providing, through a storage router, virtual local storage on remote SCSI storage devices to Fibre Channel devices, comprising:
> interfacing with a Fibre Channel transport medium;
> interfacing with a SCSI bus transport medium;
> maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices; and
> allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration. [Emphasis Added]

Claim 4 includes "providing virtual local storage on *remote* SCSI storage devices", maintaining a configuration that maps between Fibre Channel Devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices" and "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol." Claim 1 similarly includes mapping between Fibre Channel devices (e.g., workstations) and the virtual local storage and that the virtual storage and fibre channel device are remote. The present invention as recited in Claim 4 thus enables computers to access remote storage devices without the overhead of high level protocols and file systems typically required by network servers (i.e., using NLLBP) while providing the security measure of access controls.

As will be discussed more fully below, the systems of Spring and Oeda, in contrast to the invention of the '753 Patent, either do not provide remote access to storage devices or, for embodiments of those systems that may be able to provide remote access to storage devices, require the use of higher level network protocols (and therefore cannot allow access to the remote storage devices using NLLBPs). Thus, these references suffer the shortcomings of exactly the type of prior art the present invention was designed to overcome in that they are either limited in distance or require time consuming translations between higher level network protocols and NLLBPs. Moreover, as will also be discussed more fully below, Spring and Oeda fail to disclose mapping and access controls as discussed below.

D. "Remote Storage Devices" and "Allowing Access . . . Using NLLBPs" - Neither Spring nor Oeda Teaches or Suggests the Limitations of Remote Storage Devices and Allowing Access to the Remote Storage Devices Using NLLBP

Examiner Fleming relies on Spring as showing virtual local storage on a remote storage device and both Spring and Oeda as showing the ability to allow access from devices connected to a first transport medium to a remote storage device using NLLBP. Applicants respectfully submit, however, both Spring and Oeda exhibit the shortcomings of the prior art solutions that the present invention specifically overcomes. Namely, the solutions in both Spring and Oeda require a choice between local (not remote) storage that can be accessed using a NLLBP or using slower high level network protocols to access remote storage (can't allow access using NLLBP); neither Spring or Oeda provides a solution that allows access to remote storage devices using NLLBP.

1. "Remote" Requires at Least One Serial Transport Medium

Claim 4, as discussed above, provides virtual local storage on remote storage devices. A "remote storage device" is a storage device that is connected indirectly using at least one serial network transport medium to allow for storage devices to be significantly remote from the host computers. This definition is supported by both the Specification of the '753 Patent and by the claim construction recommended by the Special Master in currently stayed *Crossroads v. Dot Hill Systems Corporation*, Western District of Texas, Civil Action No. A-03-CA-754-SS (the "Dot Hill Litigation").

As described above, prior art solutions that allowed access from hosts to storage devices using a NLLBP used SCSI-to-SCSI routing devices. In this case, both data transport media sere limited distance parallel buses (SCSI is a parallel, distance-limited bus). The present invention overcomes the deficiencies of these prior art systems allowing hosts to access centralized, remote storage devices at "significantly remote positions" using a NLLBP. *See*, '753 Patent, col. 2, lines 25-31. The use of the Fibre Channel protocol (a serial protocol) allows the remote storage devices to be located at distances up to and "even in excess of 10 kilometers" from the workstations. *See*, '753 Patent, col. 2, lines 29-31. The claimed invention of the '753 Patent provides the "ability to centralize local storage for networked workstation without any cost in speed or overhead" so that each workstation can have access to "its virtual local storage as if it were locally connected" despite potentially being at a great distance from the storage devices. *See*, '753 Patent col. 2, lines 27-29. In the invention of the '753 Patent, networked hosts are thus connected to storage devices over at least one significant distance-capable link, such as Fibre Channel.

As the Fibre Channel example just presented, and the other examples provided in the '753 Patent illustrate, the ability to have remote storage devices is achieved through the use of at least one serial transport medium between the workstations and the storage devices. It is the serial interconnect that allows for attachment over large distances and, hence, the ability to provide remote storage. *See*, '753 Patent, col. 1, lines 25-32. Even in the SCSI initiator to SCSI target configuration discussed in the '753 Patent, there is a third Fibre Channel transport medium (i.e., a serial transport medium) between the two storage routers to extend the distance between the workstations and storage devices to provide the capability for having remote storage. *See,* '753 Patent col. 6, lines 19-31.[1] The serial transport medium is necessary for remote storage because parallel SCSI buses alone are severely limited in distance and cannot provide connectivity to remote storage devices in the manner of the present invention.

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[1] In this unclaimed configuration, there are two "back to back" FC-SCSI routers. Workstations are connected to the first router by a SCSI bus and storage devices are connected to the second router by a SCSI bus. The two routers are connected by a Fibre Channel transport medium.

The definition of "remote" as requiring at least one serial transport medium is further supported by the fact that in the on-going *Crossroads v. Dot Hill Systems Corporation*, Western District of Texas, Civil Action No. A-03-CA-754-SS litigation (the "Dot Hill Litigation"), Special Master Bayer recommended to the Court that "remote" be construed to mean "indirectly connected through ***at least one serial network transport medium***" (emphasis added). The pertinent portions of the Report and Recommendation of the Special Master Regarding United States Patent Nos., 5,941,972 and 6,425,035 B2 (the "Report") are attached hereto as Exhibit B. Special Master Bayer was commissioned by the Court in the Dot Hill Litigation to conduct a Markman hearing and provide recommendations to the Court as to how the claims of United States Patent No. 6,425,035 B2 (the "'035 Patent") should be interpreted. Special Master Bayer filed his recommendations in the Report after reviewing the initial Markman briefs submitted by both Dot Hill and Crossroads, conducting a Markman hearing (on August 30, 2004), and reviewing post-Markman briefs and reply briefs. After careful review and analysis, Special Master Bayer concluded that "remote" meant "indirectly connected through at least one serial network transport medium". Thus, at least one of the transport mediums (either the one connecting workstations to the storage router or the one connecting the storage router to the storage devices) recited in independent Claim 4 must be serial (e.g., cannot be parallel SCSI). Indeed, one of the transport mediums of the '753 Patent is Fibre Channel. This definition of "remote" is consistent with the idea that the invention of the '753 Patent allows for the storage devices to be at "significantly remote positions" of up to and "even in excess of 10 kilometers" from the hosts accessing those storage devices. The at least one serial connection allows for networked workstations to connect to storage remotely, while a parallel SCSI connection simply cannot.

2. Spring's SCSI-to-SCSI System Does Not Provide Remote Storage Devices

The system of Spring does not provide virtual local storage on remote storage devices. Instead, Spring teaches a system in which a server emulates local drives as local SCSI removable drives to a set of workstations. *See,* Spring, page 3, lines 1-5. Workstations access the emulated SCSI removable drives as if they were locally attached removable SCSI drives. *See*, Spring, page 10, lines 1-3. Because the drives appear as removable drives, the SCSI dismount command can be used to free media for use by other workstations. *See*, Spring, page 10, lines 16-25. As an example, in the context of a workgroup that works on large files, such as graphics, this allows one user to mount the virtual drive containing a particular image at the user's workstation, work on the image, save the image, and then dismount the virtual media. Another user can then mount virtual media and edit the media. This obviates the need to share physical media such as CD's or tapes while coordinating operations between various workstations.

The invention of Spring is illustrated in FIGURE 1 of Spring, reproduced below .

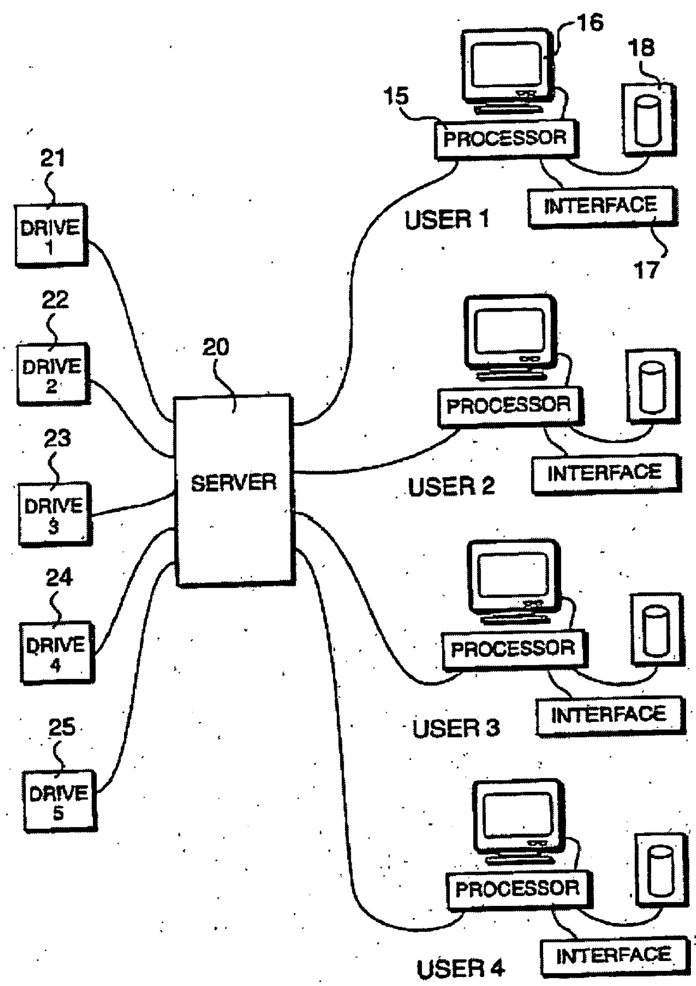

FIGURE 1 of Spring

As shown, the hosts 16 connect via a parallel SCSI bus to server 20 which is further connected to storage devices 21-25. It is clear from the Specification of Spring that the physical drives to which the data is written and from which the data is read are connected using a direct connection, specifically SCSI. Spring repeatedly mentions that the disk drives are implemented in accordance with the RAID 5 configuration. *See e.g.,* Spring, page 6, lines 1-4, and page 10, lines 1-5. In 1995, the year of Spring's filing, RAID 5 systems predominately if not exclusively used SCSI drives.[2] More significantly, Spring stresses that the differences between the emulated drives and physical drives are that the emulated SCSI drives are smaller than the physical drives and the emulated SCSI drives appear as removable while the physical drives are fixed drives. *See*, Spring, page 8, lines 18-23. Spring does not differentiate the SCSI emulated drives from the physical drives based on protocol and provides no ability to convert between storage protocols. Furthermore, this passage indicates that the physical drives are physically fixed and remain permanently in place. *Id.* Accordingly, Examiner Fleming stated that the system of Spring provides access from the USERS (i.e., host computers) through the server and to the disk drives using SCSI. *See*, May 24 Office Action, page 7 ("SCSI . . . is used from the USER to the storage router to the disc drives").

The Spring SCSI-to-SCSI system, such as that shown in FIGURE 1 of Spring, <u>does not</u> use at least one serial data transport medium and <u>does not</u> provide the capability to locate storage devices at significant distances from the workstations. There is simply no distance-capable storage link in the system of Spring as Spring relies on distance-limited SCSI interfaces. Indeed, Spring recognizes the inability of SCSI interfaces to provide a distance-capable link stating "a large number of workstations may be provided <u>relatively close</u> to server 20, in which case conventional SCSI interfaces may be employed." *See*, Spring, page 7, lines 10-12 (emphasis added). Thus, the SCSI-to-SCSI system of Spring does not provide virtual local storage on "remote storage devices" as it lacks at least one distance-capable serial transport medium.

3. Spring's Ethernet-to-SCSI System Does Not Allow Access using NLLBP

While the Spring SCSI-to-SCSI system of FIGURE 1 does not provide for remote storage devices and cannot allow for significant physical distance between the hosts and

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[2] Similar to SCSI, other existing drive connections such as ATA and IDE were severely limited in distance.

storage devices, Spring does provide some insight as to how "remote" or physically distant storage devices could be incorporated into the Spring system. While acknowledging that parallel SCSI interfaces have "limited" range, Spring states that in order to create less limited distance separation from hosts to storage devices "in alternative embodiments it may be necessary to provide alternative connections, possibly via coaxial cables, so as to increase the distance between the server and the workstations". *See* Spring, page 7, lines 3-7. Spring goes on to state that ". . . in alternative arrangements, workstations may be distributed quite widely through a building, requiring more robust connection between the processor and server 20. It is envisaged that connections of this type should allow the workstation to be displaced from the server by distances in excess of 100 meters, having characteristics similar to high speed Ethernet links." *See Id.* at page 7, lines 12-17. As will be explained more fully below, this alternative embodiment to allow "remote" storage devices in Spring does not meet the claim limitation of "allowing access" between hosts and storage devices "using NLLBPs".

Independent Claim 4 of the '753 Patent not only recites that the storage devices are "remote", but also that access is allowed "from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol." Thus, the host computers connected to the first transport medium must be able to access the remote storage devices using a NLLBP. This ability to allow access from host computers to storage devices using a NLLBP, as recited in Claim 4, requires allowing access between the host and storage device(s) using a protocol (i.e., a set of rules) that does not involve the overhead of high level protocols and file systems typically required by network servers, as supported in the '753 Patent Specification and prior litigation interpreting this claim term.

As discussed above, in systems prior to the present invention, when making a request to storage through a <u>network server to allow access between workstations and remote storage devices</u>, a workstation first had to translate the requests from its file system protocols to higher level network protocols in order to communicate with the network server, and the network server would then translate them into low level requests to the storage device(s). In contrast, as described in the '753 Patent, allowing a host to access storage devices using a NLLBP provides a mechanism by which communication between the host and the storage devices can be accomplished faster because there is no need to translate from a network protocol to a NLLBP. *See* '753 Patent Specification, col. 1, lines 43-56, col. 2, lines 9-12 and 21-24, col. 3, lines 14-25 and col. 4, lines 17-25 (distinguishing an NLLBP from higher-level protocols by contrasting the invention of the '753 Patent (allowing access using NLLBP) to prior art solutions (which allowed access using network protocols requiring translation to NLLBP)). Further, in *Crossroads v. Chaparral Network Storage, Inc.*, Western District of Texas, Civil Action No. A-00-CA-217-SS (the "Chaparral Litigation") and *Crossroads Systems (Texas), Inc., v. Pathlight Technology, Inc.*, Western District of Texas, Civil Action No. A-00CA-248-JN, the Federal District Court issued a Joint Markman Order (the "Markman Order") interpreting "NLLBP" for the purposes of United States Patent No. 5,941,972 (the "'972 Patent", the parent to the '035 Patent) as follows: "a set of rules or standards that enable computers to exchange information and do not involve the overhead of high level protocols and file systems typically required by network servers." A copy of the Markman Order is attached hereto as Exhibit C. This construction and the validity of the '972 Patent was upheld by the Federal Circuit. A copy of the Federal Circuit decision affirming the decision of the lower court is attached hereto as Exhibit D. Thus, based on both the Specification of the '753 Patent and the Markman Order, an NLLBP is a protocol that enables the exchange of information without the overhead of high-level protocols and file systems typically required by network servers.

As claimed in the '753 Patent, allowing access from host devices to storage devices is done using NLLBPs. Using the example of a first transport medium of Fibre Channel ("FC") and second transport medium of SCSI, a FC workstation can communicate SCSI commands to a storage device using the FC protocol through the storage router. In this case, the storage router receives the FC-encapsulated SCSI commands on the FC transport medium, removes the FC encapsulation and forwards the SCSI commands to the storage devices on the SCSI data transport medium (provided the FC workstation is allowed to have such access as will be discussed more fully below). There is *no translation* of the commands from a higher level network protocol to a native, low level protocol. In other words, the storage router is not required to translate from a high level command (e.g., a file system command or function call with arguments) into a SCSI command. Rather, the storage router strips the FC layer off of the existing SCSI command and forwards the SCSI command to the storage device. Thus, when the FC host workstation is allowed to have access to the SCSI storage device, that access is accomplished using NLLBPs.

Thus, as recited in Claim 4, to "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol" requires allowing access from host computers to remote storage devices using NLLBP. Thus, due to the "remote" limitation, Claim 4 requires that at least one transport medium be a serial transport medium and due to the "NLLBP" limitation, the host computers must be allowed access to the remote storage devices using a protocol that does not involve the higher level overhead typically associated with network servers. Spring simply does not teach or suggest any system that will allow hosts to access remote storage devices using NLLBP.

As discussed above, Spring does provide an alternative embodiment to its SCSI-to-SCSI embodiment of FIGURE 1 that can allow for hosts to be separated from storage devices by distances in excess of 100 meters. *See,* Spring, page 7, lines 3-17. (". . . in alternative arrangements, workstations may be distributed quite widely through a building, requiring more robust connection between the processor and server 20. It is envisaged that connections of this type should allow the workstation to be displaced from the server by distances in excess of 100 meters, having characteristics similar to high speed Ethernet links"). The use of coaxial cable for Ethernet networks was common in 1995 (e.g., 10Base-2 and 10Base-5 Ethernet), however, these Ethernet networks required the use of high-level protocols to transmit information between a workstation and a network server. In Ethernet-to-SCSI systems such as that suggested in Spring, a workstation would first translate the request from its file system protocol to a "network protocol" (i.e., Ethernet protocol) and send the request to a network server. The network server would then translate the network protocol to a native low level protocol (i.e., SCSI) and send the low level request to the attached storage device. The problem with this type of system is exactly the problem that the '753 Patent described in the Background of the Invention and was designed to overcome. Namely, this type of system creates a bottleneck that slows down the access from the hosts to the remote storage devices. Because, NLLBPs cannot be sent over long distances using a SCSI bus, the workstation must create a network protocol to send requests over the Ethernet transport medium. It takes the workstation a long time to create a network protocol and takes the server time to translate the information sent according to the network protocol into a NLLBP (and visa versa when sending the information back from the storage device to the host). In such a system, data access times from the workstation to the devices are increased.

While Spring provides no guidance as to how the emulated removable SCSI drives would be accessed via Ethernet in the suggested alternative embodiment, at the time of Spring, one of ordinary skill in the art would have understood that access to remote storage via Ethernet required the use of a higher level network protocol and there no teaching or suggestion in Spring otherwise. Thus, it would be understood that the workstations of Spring use a higher level network protocol (e.g., an Ethernet file server protocol) that is then translated by the network server into a NLLBP before access to remote storage devices can be achieved.

The system of Spring is exactly the type of system that the present invention was designed to overcome because the system of Spring **does** involve the overhead of high level protocols typically required by network servers and **does** require a translation of a network protocol into SCSI commands at the network server when allowing workstations to make requests to and from storage devices. Therefore, Spring does not teach or suggest the limitation of "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol." (emphasis added).

4. Similarly, Oeda Fails to Provide Remote Storage Devices and Allowing Access to the Remote Storage Devices Using NLLBP

Like Spring, Oeda discloses a SCSI-to-SCSI system of connecting a host computer to a storage device(s). *See* Oeda, FIGURES 1-5. FIGURE 4, illustrative of the Oeda system, is reproduced below.

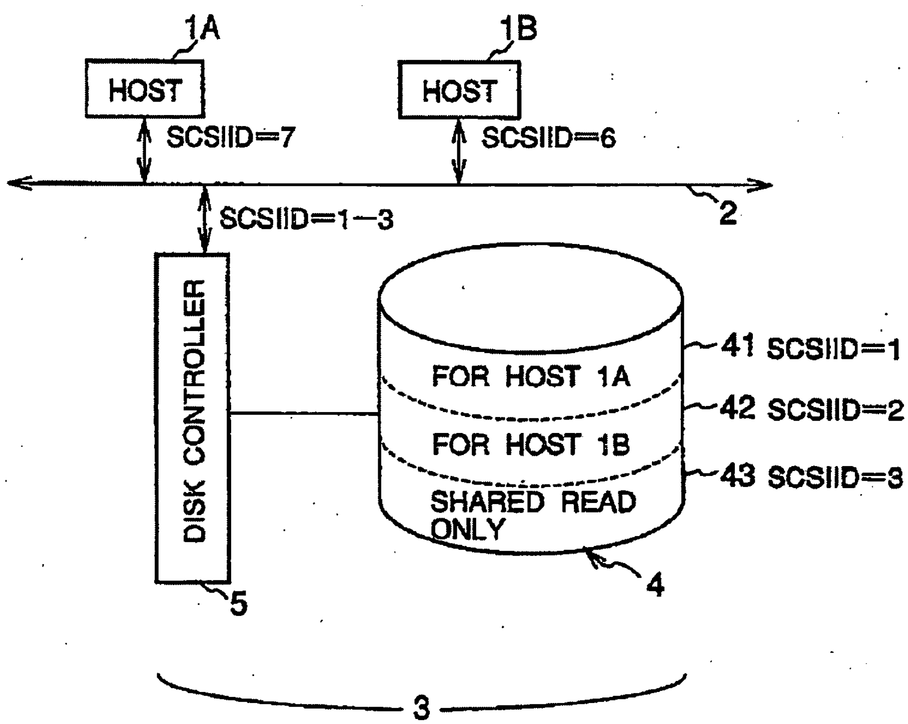

FIGURE 4 of Oeda

Using the Example of FIGURE 4 of Oeda, a SCSI magnetic disk storage device 3 (including disk controller 5 and drive unit 4) is connected to two host computers through SCSI bus 2. Thus, hosts communicate to storage devices in this Oeda system using only parallel SCSI; there is no serial transport medium between the hosts and the disk storage device. Consequently, for the reasons discussed above regarding Spring, the Oeda storage device 3 of FIGURE 4 is not remote from the host computers as recited in Claim 4 of the '753 Patent.

Like Spring, Oeda also provides an alternative embodiment that has the capability to provide hosts access to remote storage as shown in FIGURE 6 of Oeda reproduced below. Like Spring, this Oeda embodiment also fails to allow access to remote storage devices using NLLBP.

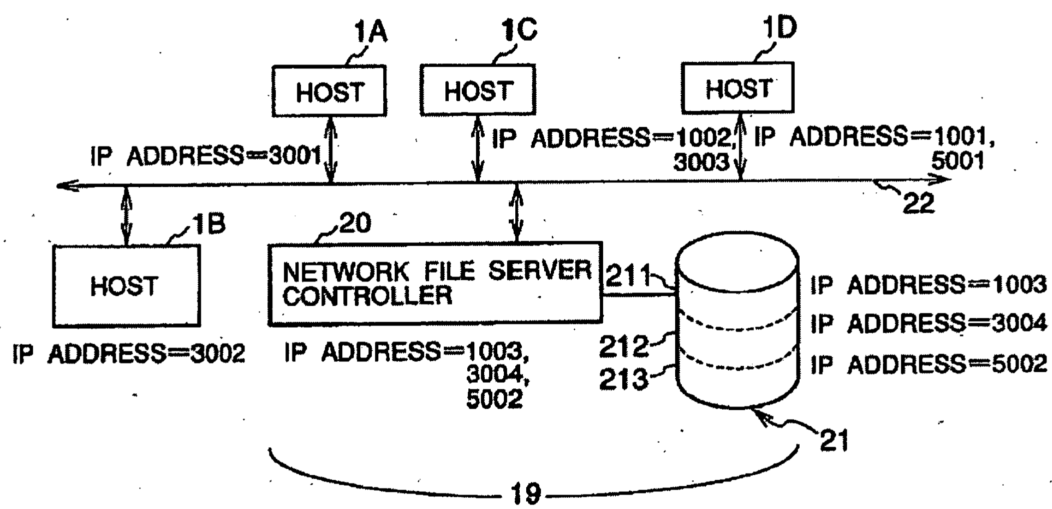

FIGURE 6 of Oeda

In FIGURE 6 of Oeda, Oeda replaces the SCSI bus 2 of FIGURE 4 with an Ethernet connection 22 and inserts into the system a network file server 19. *See,* Oeda, col. 9, lines 48-67 and FIGURE 6. As this embodiment of Oeda points out, access to remote storage devices required the use of higher-level network protocols and is not done using NLLBP. There is no teaching or suggestion in Oeda to the contrary. In fact, Oeda recognizes that a translation from the network protocol to a NLLBP must occur stating "host computer 1B must accept and deliver commands and data in which the differences of communication protocols for the SCSI bus 21 and Ethernet are considered." *See*, Oeda, col. 9, lines 47-60 (describing replacing the SCSI bus of FIGURE 5 with a network such as Ethernet). Further in conjunction with FIGURE 6, Oeda describes that while this embodiment allows the storage device to be shared among hosts using different operating systems and network protocols, it still requires the use of high-level network protocols between the host computers and file server (e.g., the network protocols used by UNIX, MS-DOS and the general purpose computer to communicate via Ethernet). *See*, Oeda, col. 10, lines 22-68.

Again, these Ethernet-based systems of Oeda are precisely the types of systems that the present invention was designed to overcome because they **do** involve the overhead of high level network protocols typically required by network servers and they **do** require a translation of a network protocol into SCSI commands at the network server when allowing workstations to make requests to and from storage devices. Thus, similar to Spring, Oeda simply does not teach or suggest the limitation of "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol." (emphasis added).

5. Summary – Allowing Access to Remote Storage Devices Using NLLBP

Neither Oeda or Spring, alone or in combination, teach or suggest allowing access from host devices to remote storage devices using NLLBPs. Spring teaches a SCSI-to-SCSI system in which workstations are connected to a network server via a SCSI bus. Spring does not disclose in this embodiment any distance capable serial transport medium, but simply the limited distance, parallel SCSI transport medium. Consequently, the SCSI-to-SCSI system of Spring does not allow access to "remote" storage devices as recited in Claim 4. In order to provide the ability to access remote storage devices, Spring introduces Ethernet connectivity (replacing the SCSI bus between the workstations and the server with an Ethernet connection) and higher-level network protocols. Because this Ethernet-to-SCSI embodiment of Spring requires the use of higher-level network protocols it does not allow "access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol" as recited in Claim 4.

Similarly, Oeda teaches a SCSI based system and an Ethernet based system that suffer the same deficiencies as the systems of Spring. In the SCSI based system of Oeda, the storage device is also not indirectly connected to the host computer by at least one serial transport medium. Consequently, the magnetic storage device is not "remote" from the host computers. The Ethernet based systems of Oeda require the use of higher-level network protocols and, as in Spring, do not allow "access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol."

Thus, in Spring and Oeda, the storage devices are not remote and access to them from the host is not provided using NLLBPs. Rather, the storage devices are connected using limited distance parallel SCSI buses. In order to provide access to a remote storage device, a higher level network protocol must be introduced. That is, in order to allow the storage devices to become remote in Spring and Oeda, access is no longer provided from the workstations to the storage devices using a NLLBP.[3] Applicants therefore respectfully submit that Spring and Oeda do not teach or suggest providing "virtual local storage on remote SCSI storage devices" and providing access "from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol" as recited in independent Claim 4. As the cited references, alone or in combination, do not teach or suggest this feature of the present invention, Applicants respectfully request allowance of Claim 4. Moreover, as will be discussed more fully below, these references certainly do not teach or suggest allowing access to remote storage devices in conjunction with mapping and access controls as claimed in the '753 Patent.

E. "Map" – Neither Spring nor Oeda Teaches or Suggests Mapping Between Devices Connected to the First Transport Medium and the Storage Devices

1. A Map Includes a Representation of the Devices on the First Transport Medium and the Storage Devices

Claim 4 recites maintaining a configuration that "maps between Fibre channel devise and the SCSI storage devices" and Claim 1 recites "mapping to virtual local storage such that a fibre channel device remote from the virtual storage can communicate data to and from the virtual storage." Mapping between Fibre Channel devices and SCSI storage devices in the present application refers to a mapping between the workstations/host computers and storage devices such that a particular workstation/host computer on the first transport medium is associated with a storage device, storage devices or portion thereof on the second transport medium. As discussed in the '753 Patent Specification, the mapping provides a correlation

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[3] Jibbe, a reference directed to a SCSI interface, simply does not address the issue of remote storage devices or allowing access to these remote storage devices using NLLBPs.

between devices on the first data transport medium and the storage devices through one or more steps. *See*, '753 Patent, col. 2, lines 6-9, col. 2, lines 19-20, and col. 8, line 61-col. 9, line 5. In addition, the Federal District Court in the Chaparral and Pathlight Litigations defined the term "map" in its Markman Order as follows: "to create a path from a device on one side of the storage router to a device on the other side of the router, i.e., from a Fibre Channel device to a SCSI device (or vice-versa). A map contains a representation of devices on each side of the storage router, so that when a device on one side of the storage router wants to communicate to a device on the other side of the storage router, the storage router can connect the devices." *See,* Markman Order, Exhibit C, page 12 (emphasis added). Thus, the mapping of the '753 Patent associates the host device(s) on the first transport medium with storage devices on the second transport medium to create a path between the host and the remote storage device (or portion thereof). For example, the map can include mapping a host workstation identifier (e.g., address or other identifier) and a virtual representation of a storage device (e.g., a virtual LUN), and potentially even further from the virtual representation of the storage device to a physical representation of the storage device (e.g., a physical LUN).

2. Neither Spring nor Oeda Teaches or Suggests a Map

As an initial matter, Examiner Fleming recognizes that Spring does not map between devices connected to the first transport medium and the storage devices as recited in Claim 4 (and likewise does not point to any place in Jibbe that teaches or suggests such a mapping). *See,* May 24 Office Action, page 7 (Spring "does not set forth a mapping between the workstations and the storage devices"). Instead, Examiner Fleming attempts to rely on Oeda to show mapping. *See*, May 24 Office Action, page 7 ("a mapping between workstations (in the form of HOSTs) and the assigned partitions (41-43) is clearly shown"). Oeda, however, does not teach mapping as recited in the '753 Patent because there is no "map" that contains a representation of a device on one side of the storage router and a representation of a storage device on the other side of the storage router so as to create a path to connect the device to the storage device (e.g., to connect the fibre channel host device to a SCSI storage device).

There is no map in Oeda that includes a representation of devices on one side of the disk controller and storage devices on the other side. Such a map is not necessary or used in Oeda, at least in part, because the Hosts are responsible for knowing which target SCSI IDs they can request and the disk controller processes target SCSI IDs without regard to the host that asserts the ID. Oeda discloses a host-based methodology to associate hosts with a storage partition and does not disclose a **map** between **devices** connected to the first transport medium and the storage devices. *See* Oeda, Col. 8, lines 9-13 (host computers are set by the operating system). In Oeda, SCSI IDs for target devices are processed by a SCSI control large-scale integrated circuit ("LSI") as described in conjunction with FIGURE 7. The LSI contains n comparators and ID registers, with each register containing a SCSI ID for a target device. *See* Oeda, col. 5, lines 44-48. When a host computer requests a particular target, it does so in the "selection phase" by marking "true" the data line among the eight data lines of the SCSI bus which correspond to the SCSI ID number of the target. *See id.* at col. 5, lines 14-22. Each comparator compares the ID number asserted during the selection phase (e.g., the ID of the desired target) with the ID in the respective register and, if a match is made, generates an ID coincidence signal. *See id.* at col. 5, lines 48-51. Using the example of FIGURE 7, if a host asserts ID 1 on the SCSI bus, comparator 74 will compare the asserted ID to the contents of register 71, comparator 75 will compare the asserted ID to the contents of register 72 and comparator 76 will compare the asserted ID to the contents of register 73. Because the asserted ID matches the contents of register 71, comparator 74 will generate an ID coincidence signal, indicating that the host is requesting SCSI ID 1. The CPU will then process the subsequent commands and data to read data from or write data to the appropriate partition associated with SCSI ID 1 (e.g., partition 41). *See,* Oeda, col. 5, line 64 through col. 6, line 13. This process is done without regard to the host that actually asserted the SCSI ID 1 in the selection phase. Thus, whenever LSI receives SCSI ID 1 in the selection phase, it processes the corresponding command to read from or write to the appropriate partition regardless of the host device that asserted SCSI ID 1.

The Examiner cites Oeda at Column 7 lines 53-Column 8, line 30 for the proposition that Oeda shows a "map", however, this reliance on Oeda is misplaced. In a multi-host environment, such as that depicted in FIGURE 4 of Oeda (shown above), each host is set beforehand by its operating system to only request specific SCSI ID's. *See* Oeda, col. 8, lines 9-31. Put another way, the operating system sets each host to limit the target SCSI IDs that host can select during the SCSI selection phase. In the example of Oeda, Host 1A is configured by the operating system to request only SCSI ID 1 and SCSI ID 3 and Host 1B is configured by the operating system to request only SCSI ID 2 and SCSI ID 3. *See* Oeda, col. 7, lines 57-65. Oeda states that it is the operating system of the computer system that sets the host computers beforehand. *See* Oeda, col. 8, lines 9-13. After the OS sets the host computer selection configuration, when a particular host selects a particular target ID, for example target

ID 1, the LSI of the disk controller identifies the appropriate partition (e.g., partition 41) as described in conjunction with the selection logic of FIGURE 7. Due to Oeda's method for using the operating system to set hosts, the disk controller does not have to (and does not) map host IDs to target SCSI IDs because only hosts configured to request target ID 1, will request ID 1 in the selection phase. Indeed, Oeda fully admits that it does not need or use such a map, stating "when disk controller 5 performs the exclusive control between an access from the host computer 1A and an access from the host computer 1B, it need not consider the difference of the device ID's (here SCSI ID's=7,6) *of the respective host computers 1A and 1B*, but it may merely judge pertinent ones of the device ID's (SCSI ID's=1, 2 and 3) of the respective partitions 41, 42, 43 selected by the host computer 1A and 1B." Oeda, col. 8, lines 20-30 (emphasis added).

Thus, in the Oeda host-based system, the *hosts* know which target SCSI IDs to request and therefore there is no need for a map at the disk controller that controls whether a particular host is mapped to (and can therefore access) a particular storage device (or portion of a storage device). In Oeda each host knows the storage device SCSI IDs it is permitted to access and makes requests only to those storage device IDs. When the disk controller receives a target SCSI ID from a host it directs commands and data to the partition associated with that requested target SCSI ID without regard to the host that made the request. In other words, the disk controller in Oeda does not consult any map to determine whether the host should be connected to the requested target SCSI ID; rather, if the disk controller of Oeda receives a request, it simply forwards it to the appropriate SCSI ID. There is simply no teaching or suggestion in Oeda that disk controller 5, or any other device in Oeda, maintain a "map" that contains a representation of host devices on one side of the disk controller and representations of storage devices on the other side of the disk controller as recited in the claims of the '753 Patent.

Thus, while Oeda does touch on the concept of setting host computer configuration by the operating system (*see,* Oeda, col. 8, lines 9-13), it does not teach or suggest doing any form of "mapping" as claimed in the '753 Patent. For example, setting the host configuration to define which target SCSI IDs a host may request can be done by setting registers in the host's host bus adapter ("HBA"). This methodology entails setting flags in registers of the host HBA indicating which SCSI bus lines the host can or cannot set as true. Thus, each host would simply have a listing or set of flags that indicate which target SCSI IDs are available to that host, but not a map as recited in the '753 Patent that represents that host device itself or the storage devices (i.e., Host 1A does not map itself to storage devices, but simply contains a list or set of register settings indicating that the HBA can only assert true on the bus lines for target SCSI ID 1 and SCSI ID 3). Neither the disk controller nor the individual hosts in Oeda are operable to map between devices on the first transport medium and storage devices. Thus, the host-based configuration method discussed by Oeda does not teach or suggest a map as recited in the '753 Patent.

Furthermore, the mapping recited in Claim 4 of the '753 Patent is between host devices connected to the first transport medium and the storage devices that are remote from the host devices. As discussed above, Oeda achieves remoteness through the introduction of Ethernet as discussed in conjunction with FIGURE 6 without the use of NLLBPs. In the Ethernet based system of Oeda, portions of storage are assigned IP addresses based on the operating system/network protocol that is allowed access that IP address and *not* the specific hosts that can access the storage. *See*, Oeda, col. 10, lines 14-22. Thus, for example, in FIGURE 6 of Oeda, partition 213 is assigned IP address 5002, which is accessible by MS-DOS based computers (i.e., any host computer that runs MS-DOS). In contrast to the invention claimed in the '753 Patent, there is no map between hosts devices and storage devices as the partitions of Oeda's Ethernet system are simply "held in correspondence with OS's and network protocols." *See*, Oeda, col. 10, lines 24-27. Once again, the Oeda system controller (network file server 19 in FIGURE 6) does not contain a map with representations of particular host computers associated with particular storage partitions, but rather Oeda simply reviews the incoming request to a partition, sees that the incoming request uses a network protocol compatible with the IP address, and allows the request to go to the storage partition without regard to which host sent the request. This is not, and Oeda therefore does not teach or suggest, a map containing a representation of the host devices associated with a representation of the remote storage devices as recited in the claims of the '753 Patent.

F. "Access Controls" – Neither Spring nor Oeda Teaches or Suggests Implementing Access Controls

1. Implementing Access Controls

Claim 4 recites "maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium . . . that implements access controls for storage space on the SCSI storage devices " To implement access controls requires more than simply allowing a host to have access to a storage device. Implementing access controls is a security measure designed to prevent unauthorized access from workstations to particular storage devices or subsets of storage as claimed and described in the '753 Patent. When access controls are implemented, particular workstations may be permitted or denied access to particular storage devices or subsets of storage devices. *See, e.g.,* FIGURE 3 of the '753 Patent and Graphic 5 above. The storage router uses access controls and routing "such that each workstation has controlled access to only the specified partition of [a storage device] which forms virtual local storage for the workstation. This access control allows security control of the specified data partitions." *See*, '753 Patent, col. 4, lines 29-34. Further, according to the Markman Order, to "implement access controls" for storage space on the storage devices means to provide "controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device." *See,* Markman Order, Exhibit C, page 6.

The access controls of the '753 Patent depend on the map discussed above to control access of devices on a first transport medium (e.g., workstations) to storage devices such that requests from devices connected to the first transport medium are directed to <u>assigned</u> virtual local storage on the storage devices. In other words, the storage to which each workstation is permitted access is controlled through the use of the map. *See*, '753 Patent, col. 4, lines 13-16 ("storage allocated to each . . . workstation 58 through the use of mapping tables or other mapping techniques"). Thus, "the router can . . . map, for each initiator, what storage access is available and what partition is being addressed by a particular request. In this manner, the storage space provided by [storage devices] can be allocated to [devices connected to the first transport medium] . . . ." *See* '753 Patent, col. 8, lines 67 – col. 9, line 5.

The access controls of Claim 4 thus permit or deny access from particular host devices connected to the first data transport medium to particular storage devices (or subsets thereof) according to a map that associates the host devices with the remote storage devices. The access controls are part of the configuration for routing commands according to the map from a device connected to the first transport medium to *defined* storage location(s) using NLLBPs (i.e., without requiring the overhead of high level protocols typically required by network servers). The access controls of the present invention thus limit access by workstations to storage devices or subsets of storage devices by allocating storage according to the map.

2. Spring Does Not Implement Access Controls

Regarding Spring, Examiner Fleming stated:

> Implementing of access controls is clearly described throughout the disclosure, especially noting that each USER has access to a large number of removable disc drives (see page 7, lines 18-27), thereby teaching the implementation of *some sort of access controls*, with the storage router (server 20) determining if the requested drive is available, and if so, granting access to the requesting workstation (see page 8, lines 10-17). Thus the access is ultimately controlled and allowed by the storage router (server 20). *See,* May 24 Office Action, page 6.

The passage of Spring cited by Examiner Fleming, namely page 8, lines 10-17, describes a conventional mechanism by which a server coordinates host access to SCSI drives, however this conventional mechanism is accomplished without access controls as defined in the '753 Patent as the coordination of host access described in Spring does not assign particular storage devices or portions thereof to particular workstations (or other device on the first transport medium). This conventional mechanism is not designed to limit any particular host from accessing any particular storage device, but rather to coordinate access to storage between hosts so as to avoid contention between hosts for the same storage. In the conventional mechanism described in Spring, when a workstation requests a logical disk drive, the server determines if the requested logical disk drive is available and if the logical disk drive is available, allows the workstation to access the logical disk drive. Under this scheme, any workstation can access the logical disk drive so long as the drive is available. In other words, Spring does not describe any mechanism that limits host access based on the ID of the host or which particular storage device the host wishes to access; rather, Spring simply uses a conventional SCSI mechanism to coordinate access based on storage device availability. There is simply no teaching or suggestion in Spring that the availability of the logical drive depends on the workstation requesting the drive and whether that particular workstation has been associated with that drive according to some mapping technique. In Spring, there is no map between the workstations of Spring and the emulated SCSI removable drives (as discussed above) that implements access controls to limit a particular workstations ability to access particular emulated SCSI removable drives.

This lack of access controls is demonstrated by Spring's utilization of aspects of removable SCSI drives to coordinate operations between workstations and the fixed SCSI disks. As described above, server 20 in Spring presents large fixed disk drives as multiple, smaller SCSI removable disks. When a workstation wishes to access one of the emulated SCSI removable disks, the workstation will request the logical drive using conventional SCSI command. *See*, Spring, page 8, lines 4-8. The server will determine if the logical disk drive is available and, if so, will return data to the workstation regarding the logical disk drive including the fact that the logical drive is removable. *See,* Spring, page 8, lines 10-17. The workstation can then transfer data to the logical disk. *See*, Spring, page 9, lines 1-3. Once the data transfer is complete, the workstation will issue a SCSI DISMOUNT command to the emulated SCSI removable disk drive. *See,* Spring, page 10, lines 17-20. Server 20 "acts upon the dismount command by *releasing the logical drive such that it can be accessed by <u>other</u> <u>workstations</u>.*" *See*, Spring, page 10, lines 24-25 (emphasis added). Thus, Spring is utilizing mechanisms to coordinate access between hosts and storage devices to make sure the storage devices is available.

However, in contrast to the invention of the '753 Patent, this methodology described in Spring does not limit access of particular workstations to specific assigned subsets of storage devices or portions thereof. Rather, any workstation can access any logical removable drive so long as that logical removable drive is not busy (i.e., is available). The use of the DISMOUNT command is to facilitate the coordination of operations of the multiple workstations that all have access to the same portions of the fixed disk drives, and *does not* prevent the access of particular workstations to specific portions of the fixed disk drives. There is simply no mechanism in Spring that prevents particular hosts from accessing particular storage. Spring thus teaches a system that *coordinates* access by multiple workstations to shared disk drives, not a system that permits or denies access by particular workstations to shared disk drives (i.e., Spring does not "limit a computer's access to specific subset of storage devices or sections of a single storage device"). Applicants respectfully submit that Spring as cited by Examiner Fleming does not teach access controls as defined by the '753 Patent. Accordingly, Applicants respectfully request allowance of Claim 4 and the respective dependent Claims.

Moreover, the Ethernet based system of Spring does not teach or suggest providing access controls for storage devices that are accessed by host computers using a NLLBP. As discussed above, the Ethernet based system of Spring relies on higher level protocols to achieve remote storage. In fact, Spring provides no discussion as to how to implement access controls in its Ethernet methodology (e.g., there is no discussion how emulating removable SCSI drives are presented over Ethernet to a host or how the DISMOUNT command is processed over Ethernet). Indeed, while there are no access controls as defined by the '753 Patent disclosed in Spring's SCSI-to-SCSI implementation, there is no discussion of any mechanism to limit access for the barely mentioned Ethernet based system of Spring. Thus, Spring fails to teach or suggest implementing access controls from remote storage devices that are accessed by a host computer using an NLLBP. Accordingly, Applicants respectfully request allowance of Claim 4.

3. Oeda Does Not Teach or Suggest Access Controls

Claim 4 of the '753 Patent recites "a method for providing virtual local storage through a storage router" that includes "maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices." The storage router of claim 4 is clearly configured to connect between the data transport medium to which the host devices are connected (e.g., Fibre Channel) and the data transport medium of the storage devices are connected (e.g., SCSI) to provide for centralized management of access controls, thus allowing the ability to centrally control and administer storage space. *See*, '753 Patent, col. 2, lines 33-38. Moreover, the mapping and implementing access controls, as discussed above, are tied together as access controls are implemented to "cause certain requests from FC Initiators to be directed to assigned virtual local storage." *See,* '753 Patent, col. 8, lines 61-64. Again, access controls are performed by a device (storage router) where mapping between devices on the first transport medium and the storage devices occurs, allowing for central control of storage space.

The SCSI-to-SCSI implementation of FIGURE 4 of Oeda does not provide for this type of access controls. In other words, there is no device in the system of FIGURE 4 of Oeda that manages storage space for hosts using mapping. Instead, in Oeda each host computer is set by the operating system to be assigned to a particular partition. Thus each host in Oeda contains flags, or other indications set beforehand, of the target SCSI bus lines corresponding to target SCSI IDs it can request so that each host can only request those target IDs (e.g., Host 1A is configured so that it can only send requests to SCSI ID 1 and SCSI ID 3). *See*, Oeda, col. 8, lines 9-14. Because Host 1A is configured not to request SCSI ID 2, it will not erroneously request partition 42. *See*, Oeda, col. 8, lines 14-16. The control of the SCSI IDs and therefore corresponding partitions that hosts can request thus occurs at *each of the hosts* and not at a supervisor unit/storage router or mapping as in Claim 4 of the '753 Patent.

In contrast to Oeda, Claim 4 of the '753 Patent requires a storage router that "implements access controls". In contrast, Oeda, has no supervisor unit or storage router connected between the hosts and remote storage devices that implements access controls. The disk controller 5 of Oeda as shown with reference to LSI 6 of FIGURE 7, simply forwards requests for a particular SCSI ID to the appropriate target. The disk controller does not process the host IDs, or perform any other mechanism to limit access of any particular host to any particular storage. The disk controller merely processes "pertinent ones of the device ID's (SCSI ID's=1, 2 and 3) of the respective partitions 41, 42, 43 selected by the host computer 1A and 1B." Oeda, col. 8, lines 20-30. Disk controller 5 is completely agnostic as to which host asserts a specific target ID as it is assumed in Oeda available target IDs are set beforehand at the hosts. Thus, disk controller 5 does not act as a storage router or supervisor unit that implements access controls for the storage space to limit a host's access to portions of the storage space.

Similarly, Oeda does not maintain "a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices "as recited in Claim 4. In the '753 Patent, the implementation of access controls is accomplished in conjunction with the map which maps the host devices to the remote storage devices. As discussed above, neither the disk controller 5 of Oeda nor any other component of Oeda utilize a map that maps between devices connected to the first transport medium and the storage devices. There is, consequently, no component of Oeda that uses a map to provide for management of storage space "that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices." In other words, there is no teaching in Oeda of implementing access controls by providing a mapping of what storage access is available and what partition is being addressed by a particular request such that "the storage space provided by [storage devices] can be allocated to [devices connected to the first transport medium] . . . ." *See* '753 Patent, col. 8, lines 67 – col. 9, line 5.

In Oeda, because the hosts are set to know which SCSI IDs they can request and <u>any</u> host (or other device) that asserts a particular SCSI target ID is granted access to the corresponding partition, there is simply no mechanism (e.g., supervisor unit, storage router or mapping) that limits each particular hosts' access to the storage device or particular partitions of the storage device. Therefore, Applicants respectfully request allowance of Claim 4.

4. The Ethernet Based Configuration of Oeda Does Not Teach or Suggest Any Form of Access Controls For Remote Storage

As discussed previously, the storage devices for which access controls are provided are "remote storage devices" that are remote from the host devices requesting access. The portions of Oeda cited by the Examiner, namely those associated with of FIGURE 4, as allegedly providing access controls are discussed entirely within the context of a local, SCSI-to-SCSI storage implementation. While this host-based mechanism of Oeda is not the claimed access controls mechanism of the '753 Patent (as discussed above), Oeda provides no teaching or suggestion as to how even that host-based mechanism could be implemented for remote storage and, indeed, discards entirely that host-based storage allocation mechanism of FIGURE 4 when moving to the remote storage implementation of FIGURE 6.

As discussed above, Oeda introduces Ethernet to achieve remoteness. As shown in FIGURE 6, portions of storage are assigned IP addresses based on the operating system that can access that IP address, not the specific hosts that can access the storage. *See*, Oeda, col. 10, lines 14-22. Thus, for example, partition 213 is assigned IP address 5002, which is accessible by MS-DOS based computers. *See*, Oeda, col. 10, lines 37-39. Any computer that supports MS-DOS can access partition 213. *See*, Oeda, col. 10, lines 46-54 (explaining how the network file server handles requests to a particular IP address). The network file server does not provide any security to prevent hosts using the same operating system from accessing each other's data but simply forwards requests to a particular IP address to the proper storage.

While Oeda discloses providing remote storage, this is done using a higher level network protocol (not using NLLBP) without any access controls as claimed in the '753 Patent. Any computer using the same operating system and higher level network protocols can access the same partitions of storage. Oeda does not teach or suggest providing access controls for remote storage that is accessed by a host using NLLBP and, consequently, does not remedy the deficiencies of Spring. Applicants therefore respectfully request allowance of Claim 4.

G. The Combination of Oeda and Spring Does Not Teach or Suggest the Present Invention

Even assuming *arguendo* that Spring and Oeda can be combined as suggested by Examiner Fleming, these references in combination do not teach or suggest the present invention. If combined in a SCSI-to-SCSI system, the combination of Spring and Oeda fails to teach or suggest mapping and implementing access controls for the storage space or mapping and implementing access controls at a storage gateway or a storage router. For remote storage, both Spring and Oeda teach the use of higher level network protocols and neither teaches mapping between devices connected to the Ethernet transport medium and the remote storage devices or implementing access controls for the storage space on the remote storage devices. Thus, the combination of Spring and Oeda fails to disclose allowing access to remote storage using a NLLBP in conjunction with providing a mapping between devices connected to a first transport medium and remote storage in conjunction with implementing access controls for the remote storage devices.

H. The Jibbe Reference Does Not Address the Deficiencies of Spring and Oeda

Jibbe discloses a SCSI interface that is used to connect a host computer to a SCSI disk array. The interface of Jibbe allows a host computer to transfer operations to a number of disk drives configured as a RAID 1, 2, 3, 4, or 5 disk array. *See*, Jibbe, Abstract. There is simply no teaching or suggestion in Jibbe that the disk array should be attached by anything other than a local SCSI bus and consequently does not teach or suggest remote storage devices. Moreover, Examiner Fleming did not cite the Jibbe reference as showing, nor does the Jibbe reference appear to show, mapping between devices connected to the first transport medium and the storage devices, implementing access controls or allowing access from hosts to storage devices using NLLBP.

I. The Cummings Reference Does Not Address the Deficiencies of Spring and Oeda

Similarly, the Cummings reference does not remedy the deficiencies of Spring and/or Oeda. Cummings is an article written near the inception of Fibre Channel that prophesizes potential uses for Fibre Channel without actually providing implementation details for any of these uses. Cummings provides no teaching or suggestion of a map or access controls, and more particularly, does not teach or suggest a map between Fibre Channel host devices and remote storage devices or implementation of access controls between a host and remote storage devices. Consequently, Cummings in combination with Spring, Oeda and Jibbe fails to teach or suggest the claimed invention.

J. Summary: There is No *Prima Facie* Case of Obviousness

The '753 Patent provides a system and method which allows a host computer to access **remote** storage devices using an NLLBP, while mapping between the host computers and remote storage devices (or portions thereof) and implementing access controls for storage space on the remote storage devices. Spring and Oeda teach either local SCSI-to-SCSI systems that do not provide remote storage or Ethernet-to-SCSI systems that rely on higher level protocols. While the Examiner has attempted to point to access controls in Spring and access controls and mapping in Oeda, these references show neither access controls nor mapping. Moreover, the portions in Spring and Oeda relied on for mapping and access controls (which do not, in fact, show mapping and access controls as discussed above) only apply to the SCSI-to-SCSI local storage implementations and do not apply to the Ethernet-to-SCSI implementations of these references that allow for remote storage. Consequently, Spring and Oeda do not show a system or method that provides access from host computers to remote storage using NLLBP, while applying access controls that limit a host computer's access to specified portions of the remote storage, nor do they teach mapping between the host computers and the remote storage devices. Moreover, none of the additional art cited by the Examiner makes up for the deficiencies in Spring and Oeda.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness for Claims 1-8 as the prior art references do not disclose, teach or suggest all of the claim limitations. Specifically, the prior art cited by Examiner Fleming does not teach or suggest: i) providing virtual local storage on remote storage devices and allowing access from devices connected to the first transport medium to the remote storage devices using a NLLBP; in conjunction with ii) mapping between devices on the first transport medium and the storage devices; in conjunction with iii) implementing access controls. While Examiner Fleming provided a thorough analysis of Spring and Oeda, these references simply fail to teach the claimed limitations. Furthermore, Jibbe and Cummings do not make up for the deficiencies of Spring and Oeda. Accordingly, Applicants respectfully request allowance of Claims 1-8.

II. Conclusion

Applicants appreciate Examiner Fleming's consideration of the previous response and Examiner's interview when drafting the May 24 Office Action. Moreover, Applicants further appreciate Examiner Fleming's careful and detailed review of all of the submitted prior art and the issuance of a non-final office action. Applicants respectfully submit, however, that Claims 1-14 are distinguishable from Spring, Oeda and Jibbe for the reasons stated herein. Therefore, Applicants respectfully request allowance of all claims subject to reexamination.

This Reply was served via First Class Mail on July 22, 2005 to Larry E. Severin, Wang, Hartmann & Gibbs, PC, 1301 Dove Street #1050, Newport Beach, CA 92660.

The Director of the U.S. Patent and Trademark Office is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-3183 of Sprinkle IP Law Group.

Respectfully submitted,

Sprinkle IP Law Group
Attorneys for Applicant

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March 8, 2004

EXHIBIT B

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

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CROSSROAD SYSTEMS (TEXAS), INC.,
Plaintiff,

-vs-

Case No. A-03-CA-754-SS

DOT HILL SYSTEMS CORPORATION,
Defendant.

REPORT AND RECOMMENDATION OF THE SPECIAL MASTER REGARDING UNITED STATES PATENT NOS. 5,941,972 and 6,425,035 B2

Attached hereto is the Special Master's Report and Recommendation to United States District Judge Sam Sparks regarding the construction of claims in United States Patent Nos. 5,941,972 ("the '972 patent") and 6,425,035 B2 ("the '035 patent").

The Special Master notes that during the course of the pre-hearing and post-hearing briefing as well as the *Markman* hearing itself, the parties reached agreement on certain terms initially identified as being in dispute. For instance, the parties' stipulated definition of the claim term "native low level, block protocol," which is the same in both patents, was incorporated into their Stipulated Definitions of Claim Terms [#131], filed with the Court on August 31, 2004. Also, although Crossroads initially identified the term "remote storage devices" in the '035 patent as one of the terms requiring the Court's construction, it has apparently abandoned that position since the parties' dispute over the meaning of "remote storage devices" may be resolved by the Court's construction of the word "remote" without the need for a separate construction of the entire phrase.

Additionally, in its post-hearing briefing, Crossroads stipulated to Dot Hill's definition of the term "allow access" in both patents based on the representations of Dot Hill's counsel at the hearing and in Dot Hill's briefing that the portion of Crossroads' proposed definition which was excluded by Dot Hill's definition—"preventing unauthorized communication"—is part of the definition of the phrase, "implementing access controls," which also appears in the patents. *See*

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Crossroads's Post-Hr'g *Markman* Br. at 8; Tr. of *Markman* Hr'g at 119:2–19; Dot Hill's Post-*Markman* Hr'g Claim Construction Br. at 22.

Proposed constructions for the remaining disputed terms are attached hereto. The parties may file written objections to the recommendations made in this report within ten (10) days from the date of their receipt of it pursuant to the Court's Order of February 23, 2004.

SIGNED this the 19th day of January 2005.

Karl Bayer

KARL BAYER
SPECIAL MASTER

Special Master's Proposed Construction of Disputed Terms

Actual Claims Language	Crossroads' Proposed Construction	Crossroads' Evidence	Dot Hill's Proposed Construction	Dot Hill's Evidence	Special Master's Construction
				computer through a network)." (DHS Brief Ex. 10)	
A storage router for providing virtual local storage on remote storage devices to devices, comprising: a buffer providing memory work space for the storage router; a first controller operable to connect to and interface with a first transport medium;	**Remote:** "Indirectly connected through at least one serial network transport medium that encapsulates the native low-level block protocol."	**Remote:** **Intrinsic:** '035 patent: col. 1, ll. 23-36; col. 2, ll. 1-34; col. 5, ll. 46-48; col. 5, ll. 52-57; col. 6, ll. 19-31; col. 9, ll. 26-31. **Extrinsic:** Tr. 102:14-20; Rhyne Cross, Tr. 159:17-18; Rhyne Cross, Tr. 161:7-8; Rhyne Cross, Tr. 174:14-24; Tr. 180:5-14; Mr. Erwine's Notes, Shelton Decl. ISO Crossroads' Reply, Ex. 4.	**Remote:** Indirectly connected and capable of physical separation. NOTE: This is the definition of *remote*, but since this phrase appears only in the preamble to explain the context in which the storage router is used, it is not a limitation of this claim.	**Remote:** **Intrinsic:** '035 Patent: Col. 1, lines 39-42 using the term "remote" to refer to storage which is not "local," and defining "local" as "a disk drive, tape drive, CD-ROM drive or other storage device contained within, or locally connected to the workstation." Col. 1, lines 63-67, describing storage capacity which is not local as "remote." Col. 2, line 32 "significantly remote" **Extrinsic:** *Webopedia* definition of "remote" (Last modified	**Remote:** Indirectly connected through at least one serial network transport medium.

Special Master's Proposed Construction of Disputed Terms

Actual Claims Language	Crossroads' Proposed Construction	Crossroads' Evidence	Dot Hill's Proposed Construction	Dot Hill's Evidence	Special Master's Construction
				September 1, 1996) as "In networks, remote refers to files, devices, and other resources that are not connected directly to your workstation. Resources at your workstation are considered local" (DHS Brief Ex. 6) *Webopedia* definition of "local" (Last modified September 1, 1996) as "In networks, local refers to files, devices, and other resources at your workstation. Resources located at other nodes on the network are remote." (DHS Brief Ex. 6) Deposition of inventor Hoese, pages 143, 146, 147, 154-155 confirming that "remote" is not a function of distance by stating "It appears to be that the intent was to describe the storage as	

Special Master's Proposed Construction of Disputed Terms

Actual Claims Language	Crossroads' Proposed Construction	Crossroads' Evidence	Dot Hill's Proposed Construction	Dot Hill's Evidence	Special Master's Construction
				not being directly connected as local storage would be, but to be connected remotely, as in across a network or other means." (DHS Brief Ex. 14) Deposition of inventor Russell pages 104-105 confirming that "remote" is not a function of distance by stating "And it might be right next to me or it could be, you know, across the country, but that would allow me to get at that remote storage." (DHS Brief Ex. 15) Declaration of Rhyne, paragraph 19, stating that "[T]he meaning of 'remote' in general and in the specific context of the Crossroads patents has nothing to do with the physical distance between a workstation	

Special Master's Proposed Construction of Disputed Terms

Actual Claims Language	Crossroads' Proposed Construction	Crossroads' Evidence	Dot Hill's Proposed Construction	Dot Hill's Evidence	Special Master's Construction
				and a storage device, but rather has to do with the topological nature of the interconnection between those devices." (DHS Responsive Brief Ex. 18) Declaration of Rhyne, paragraph 27, stating that "[T]he common meaning of 'remote' is the opposite of 'local,' and does not carry a distance characteristic." (DHS Responsive Brief Ex. 18) Declaration of Hodges in Support of Crossroads' Opening Markman Brief (7/27/04), paragraph 9, stating that "The term 'local storage' typically refers to storage devices which are directly connected to the computer (as opposed to storage devices connected to a computer through a network). Local storage also	

Special Master's Proposed Construction of Disputed Terms

Actual Claims Language	Crossroads' Proposed Construction	Crossroads' Evidence	Dot Hill's Proposed Construction	Dot Hill's Evidence	Special Master's Construction
				typically refers to storage devices which are located a very short distance from the computer, i.e. a few feet." (Crossroads' Brief) Markman hearing testimony of Rhyne at 15:3-15, showing that a definition of "remote" could be simply "indirectly connected." (Hearing Transcript)	
a second controller operable to connect to and interface with a second transport medium; and a **supervisor unit** coupled to the first controller, the second controller and the buffer, the **supervisor unit** operable to map between devices connected to the first transport medium and the storage devices,	**Supervisor Unit:** "A computer processing device programmed to process data in a buffer in order to map between device connected to a first transport medium and devices connected to a second transport medium which implements access controls."	**Supervisor Unit:** **Intrinsic:** '035 patent: col. 6, ll. 3-10; col. 9; ll. 22-31. **Extrinsic:** Hodges Direct, Tr. 36:3-37:9.	**Supervisor Unit:** A microprocessor programmed to process data in a buffer in order to map between devices connected to the first transport medium and storage devices and which implements access controls.	**Supervisor Unit:** **Intrinsic:** '035 Patent: Col. 5, lines 12-17, describing a Supervisor Unit that "comprises a microprocessor ..." Col. 1, lines 37-39 and col. 4, lines 39-40 equating a "computing device" with workstations. Compare '035 claims	**Supervisor Unit:** A device comprising at least: (1) a microprocessor, incorporating independent data and program memory spaces; and (2) associated logic required to implement a stand alone processing system and programmed to process data in a buffer in order to map between devices connected to a first transport medium and devices connected to a second transport medium and which implements access controls.

EXHIBIT C

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

FILED
JUL 27 2000
U.S. DISTRICT COURT
CLERK'S OFFICE
BY DEPUTY

CROSSROADS SYSTEMS, (TEXAS), INC.	§	
	§	
vs.	§	NO. A 00 CA 217 SS
	§	
CHAPARRAL NETWORK STORAGE, INC.	§	

CROSSROADS SYSTEMS, (TEXAS), INC.	§	
	§	
vs.	§	NO. A 00 CA 248 SS
	§	
PATHLIGHT TECHNOLOGY, INC.	§	

ORDER

BE IT REMEMBERED that on the 25th day of July 2000 the Court, in accordance with *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995), *aff'd*, 116 S. Ct. 1384 (1996), held a hearing at which the parties appeared by representation of counsel and made oral arguments on their proposed claims construction. At the hearing, the parties presented a Joint Stipulation of Claim Construction, indicating that the parties have agreed upon the definitions for seventeen terms and/or phrases in U.S. Patent No. 5,941,972 ("the '972 patent"), and that only ten terms and/or phrases in the '972 patent remain in dispute. After considering the briefs, the case file as a whole, and the applicable law, the Court enters the following opinion and order.

I. Standard for Claims Construction

The construction of claims, or the definition of the terms used in the claims, is a matter of law for the Court. When adopting a claim construction, the Court should first consider the intrinsic evidence, which includes the claims, the specification, and the prosecution history. *See Vitronics*

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Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996) (explaining that intrinsic evidence is "the most significant source of the legally operative meaning of disputed claim language"). Not surprisingly, the starting point is always "the words of the claims themselves." *Id.*; *see also Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998). The words of the claims are generally given their ordinary and customary meaning, unless the patentee intended to use a "special definition of the term clearly stated in the patent specification or file history." *Vitronics*, 90 F.3d at 1582. Thus, the Court must review the specification and file history to determine whether the patentee intended to use any such "special" definitions. *See id.* The specification and file history may also be consulted as general guides for claim interpretation. *See Comark*, 156 F.3d at 1186.

The specification and file history, however, are not substitutes for the plain language of the claims. The specification is not meant to describe the full scope of the patent – it includes only a written description of the invention, sufficient to enable a person skilled in the art to make and use it, as well as the invention's "best mode." *See* 35 U.S.C. § 112. Thus, the claims may be broader than the specification, and generally should not be confined to the examples of the invention set forth in the specification. *See Comark*, 156 F.3d at 1187 ("Although the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims."). Indeed, the Federal Circuit has repeatedly emphasized that "limitations from the specification are not to be read into the claims." *Id.* at 1186.

In addition to examining the intrinsic evidence the Court may, in its discretion, receive extrinsic evidence regarding the proper construction of the patent's terms. *See Key Pharmaceuticals* *v. Hercon Labs. Corp.*, 161 F.3d 709, 716 (Fed. Cir. 1998) ("[T]rial courts generally can hear expert testimony for background and education on the technology implicated by the presented claim construction issues, and trial courts have broad discretion in this regard."). The plaintiff has provided an expert affidavit and the defendant has provided excerpts from several dictionaries as extrinsic evidence concerning the construction of the terms of the '972 patent.

II. "implements access controls for storage space on the SCSI storage devices"

This phrase is used in claims 1, 10 and 11 of the '972 patent. The parties dispute whether the phrase refers to "access controls" only for certain subsections of a divided SCSI storage device, or whether it also includes limiting access to entire undivided SCSI storage devices. The plaintiff argues the phrase includes both kinds of access controls; the defendants say the phrase refers only to access controls for various subsections within a single divided SCSI storage device. The defendants also argue the plaintiff's construction is improper because, if adopted, it will result in the '972 patent being invalidated by prior art.

The plaintiff proposes the following definition: "provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device." *See* Plaintiff's Brief, at 20. The defendants propose the phrase should be defined as "partitions the storage space on each one of the SCSI storage devices and defines the accessibility of each resulting partition." *See* Defendants' Brief, Ex. 2. The Court agrees with the plaintiff.

The intrinsic evidence of the '972 patent shows the plaintiff's invention is intended to restrict access both to subsections of a SCSI storage device, as well as to entire, undivided SCSI devices. First, the plain language of this phrase refers only to "storage space" and does not limit the space only to subsections of a divided SCSI storage device. Second, Figure 3 of the '972 patent supports a broad reading of this phrase. Figure 3 shows three SCSI storage devices, two of which are undivided (60 and 64). The third device (62) is divided into four subsections of storage space. From the simple labeling on Figure 3, it is clear that the entire, undivided storage device (64) is meant to be accessed only by a single workstation (computer E). Thus, Figure 3 expressly shows that the plaintiff's invention contemplates using "access controls" for an entire, undivided storage device as well as for the divided subsections within a single storage device.[1] Third, the language of the specification expressly describes limiting access to an entire, undivided SCSI storage device. Specifically, in referring to Figure 3, the specification states "storage device 64 can be allocated as storage for the remaining workstation 58 (workstation E)." *See* '972 Patent, at 4:20 - 4:21. At the hearing, the defendants' counsel argued that, simply because Figure 3 describes this feature does not mean the feature was intended to be part of the claimed invention. The Court soundly rejects this argument. Figure 3 is meant to be an example of how the plaintiff's claimed invention can be implemented, and the specification clearly describes this figure as illustrating one implementation of the claimed invention. Adopting the defendants' argument would ignore a fundamental principle of claims construction, oft repeated in the defendants' brief and oral arguments, that the specification is "the single best guide to the meaning of a disputed term." *See Vitronics*, 90 F.3d at 1582. Finally, the defendants correctly point out that the specification also refers to the single, undivided storage device (64) as a "partition (i.e., logical storage definition)." *See* '972 Patent, at 4:44 - 4:47. Rather than compel the defendants' proposed construction, however, this language supports the plaintiff's

[1] Figure 3 also discloses – and the defendants do not dispute – that the plaintiff's invention contemplates limiting access to various subsections of the divided SCSI storage device (62).

argument at the hearing that a discrete unit of storage – whether an entire SCSI storage device or a subsection within that device – can be referred to as a "partition."[2]

The defendants also argue that, even if the intrinsic evidence supports the plaintiff's proposed definition, this definition is nonetheless improper because it would cause the '972 patent to read directly upon prior art (and therefore be invalid). It is true that "claims should be read in a way that avoids ensnaring prior art if it is possible to do so." *Harris Corp. v. IXYS Corp.*, 114 F.3d 1149, 1153 (Fed. Cir. 1997). However, the defendants have not shown that the prior art at issue – the Lui patent – would be "ensnared" by adopting the plaintiff's definition. Importantly, the Lui patent was part of the prior art expressly considered by the patent examiner before granting the '972 patent. The patent examiner apparently did not use the Lui patent to reject a single claim in the '972 patent. The patent examiner also did not issue an Office Action requiring the plaintiff to distinguish its invention from the Lui patent on access control (or any other) grounds. Although the Patent Office is not the model of efficiency or thoroughness, its failure to cite the Lui patent as potentially invalidating prior art creates a strong presumption that the Lui patent does not read upon the plaintiff's claimed invention. In addition, it does not appear to the Court that the Lui patent reads upon the '972 claimed invention. While the Lui patent does disclose a system of Fibre Channel computers and SCSI storage devices, *see* Defendants' Brief, Ex. 6, at 2:53 - 2:65, the similarities end there. The Lui patent concerns an invention of "bypass circuits" used to "prevent the failure of any device" in the system. *See id.*, at Abstract. The invention of the Lui patent is not concerned with the swift transfer of information across a router, and thus does not disclose techniques for mapping,

[2] The Court expressly notes, however, that it is not defining the term "partition" in this order, as that term is not used in the '972 claim language.

implementing access controls, or a memory buffer.[3] At the hearing, the defendants' counsel suggested that Figure 2 of the Lui patent discloses the claimed invention of the '972 patent. However, Figure 2 of the Lui patent is not a part of the Lui invention; rather it is an illustration of a "conventional" network system that the Lui invention allegedly improves upon. *See id.* at 3:66. The Court rejects the defendants' argument that "conventional" network systems also read directly upon the '972 claimed invention. The patent examiner may have let one piece of prior art slip by; he or she would not have missed a "conventional" network system directly applicable to the plaintiff's claimed invention.

In sum, the Court will adopt the plaintiff's proposed definition and construe the phrase "implements access controls" in the claims of the '972 patent to mean "provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device."

III. "allocation of subsets of storage space to associated Fibre Channel devices, wherein each subset is only accessible by the associated Fibre Chanel device"

The dispute here is essentially the same as in the preceding section. This phrase is used in claims 2, 8 and 12 of the '972 patent. As it did with the "implements access controls . . ." phrase, the plaintiff argues the "allocation . . ." phrase means that specific Fibre Channel devices can be allocated storage space on subsections of a single SCSI storage device and on entire, undivided SCSI storage devices. The defendants stick to their general argument on this issue, and contend the phrase

[3] The defendants argue these features are "implicitly" found in the Lui specification and in any event were disclosed in other prior art. *See* Defendants' Brief, at 12 and n.1. The Court is not persuaded that these features are "implicitly" disclosed by the Lui patent, and the other prior art briefly referenced by the defendants makes no mention of combining that prior art with the invention of the Lui patent, or vice-versa.

means storage space can only be allocated on subsections of a single divided SCSI storage device. Both parties agree this storage space, however it is defined, can only be accessed by the specified Fibre Channel device(s).

The plaintiff's proposed definition is "subsets of storage space are allocated to specific Fibre Channel devices." *See* Plaintiff's Brief, at 26. The defendants say the phrase should be defined to mean "one or more partitions that are only accessible by a single Fibre Channel device." *See* Defendants' Brief, Ex. 2. For the reasons discussed in the preceding section, the Court adopts the plaintiff's proposed construction.

IV. "supervisor unit"

This term is used in claims 1, 2 and 10 of the '972 patent. The plaintiff contends this term should be defined as "a microprocessor programmed to process data in a buffer in order to map between Fibre Channel devices and SCSI devices and which implements access controls." *See* Plaintiff's Brief, at 25. The defendants argue the term should be defined as "an Intel 80960RP processor" with several specific features. *See* Defendants' Brief, Ex. 2.

The defendants argue their construction is mandated by the means-plus-function analysis of § 112(6) of the Patent Act, because the claims of the '972 patent do not adequately describe the "supervisor unit" to be used. *See* Defendants' Brief, at 15-17. The plaintiff argues that § 112(6) does not apply because the term "means" is not used with the term "supervisor unit" and because the term "supervisor unit" is adequately described by other claim language in the '972 patent. *See* Plaintiff's *Markman* Exhibits, at 35-39.

Section 112(6) of the Patent Act provides that when a claim refers to the "means for" a specific act, but fails to adequately describe these means, the means then must be defined by reference to the specification. *See* 35 U.S.C. § 112(6).[4] If the claim language at issue does not include the term "means," there is a presumption that the § 112(6) means-plus-function analysis does not apply. *See Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1318 (Fed. Cir. 1999) ("[W]hen an element of a claim does not use the term 'means,' treatment as a means-plus-function claim element is generally not appropriate."). To overcome this presumption, the party seeking to apply § 112(6) must show the claim language at issue is purely functional and that other claim language does not adequately describe the disputed term. *See id.* ("[W]hen it is apparent that the element invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means-plus-function element despite the lack of express means-plus- function language."). From a review of the claim language as a whole, the Court agrees with the plaintiff that the term "supervisor unit" is not purely functional, but refers instead to a device that can perform the tasks specifically listed in the claim language of the '972 patent. Specifically, claims 1, 2 and 10 of the '972 patent describe a "supervisor unit" that can: (1) maintain and map the configuration of networked Fibre Channel and SCSI storage devices; (2) include in this configuration an allocation of specific storage space to specific Fibre Channel devices; (3) implement access controls for the SCSI storage devices; and (4) process data in the storage router's buffer to allow an exchange between the Fibre Channel and SCSI storage devices. *See* '972 Patent,

[4] Section 112(6) reads as follows: "An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112(6).

at Claims 1, 2 and 10. These are the same tasks described in the plaintiff's proposed definition. In addition, the specification expressly defines the "supervisor unit" as "a microprocessor" (a computer chip) and specifically as "a microprocessor for controlling operation of storage router 56 and to handle mapping and security access for requests between Fibre Channel 52 and SCSI bus 54." *See id.* at 5:7 - 5:10. However, neither the specification (nor the claim language) limits the '972 patent to the specific Intel computer chip referenced by the defendants. Although the defendants correctly point out that the Intel 80960 chip is the only computer chip expressly named in the '972 patent and the specification describes many features this chip, the defendants fail to note that the Intel 80960 chip is listed as only "one implementation" of the claimed invention's microprocessor. *See* '972 Patent, at 5:63. The defendants are attempting exactly what the Federal Circuit prohibits – to limit the claims to the preferred embodiment and examples of the specification. "This court has cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification." *Comark*, 156 F.3d at 1186 (quoting *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1563 (Fed. Cir. 1988)). The Court will not use an example of "one implementation" in the specification to limit the plain language of the claims. Accordingly, the Court adopts the plaintiff's definition of "supervisor unit" and will construe that term as used in the claims of the '972 patent to mean "a microprocessor programmed to process data in a buffer in order to map between Fibre Channel devices and SCSI devices and which implements access controls."

V. "SCSI storage devices"

This term is used in claims 1, 4, 7, 9-11 and 14 of the '972 patent. The plaintiff argues that this term essentially needs no further definition because the term SCSI is so well-known in the industry, but proposes that the term can be further defined as "any storage device including, for example, a tape drive, CD-ROM drive, or a hard disk drive that understands the SCSI protocol and can communicate using the SCSI protocol." *See* Plaintiff's Brief, at 18. The defendants argue the term should be defined as "any storage device that uses a SCSI standard and has a unique BUS:TARGET:LUN address." *See* Defendants' Brief, Ex. 2.

The Court agrees with the plaintiff. Essentially, the defendants contend their narrow definition should be used because it "comports with '972 specification" and its discussion of SCSI storage devices. *See* Defendant's Brief, at 14. However, the specification language referred to by the defendants is only one example of how the SCSI storage device addressing scheme "can" be represented. *See* '972 Patent, at 7:39. Again, the defendants are impermissibly trying to limit the claim language to an example given in the specification. *See Comark*, 156 F.3d at 1186-87. For the sake of extra clarity, the Court will adopt the plaintiff's proposed definition for this term.

VI. "process data in the buffer"

This phrase is used in claims 1 and 10 of the '972 patent. The plaintiff argues the phrase is adequately defined on its own and by the surrounding claim language. The defendants contend the phrase should be defined as "to manipulate data in the buffer in a manner to (a) achieve mapping between Fibre Channel and SCSI devices, and (b) apply access controls and routing functions." *See* Defendants' Brief, Ex. 2.

The plain language of claims 1 and 10 disclose that the supervisor unit (the microprocessor) processes data in the buffer "to interface between the Fibre Channel controller and the SCSI controller to allow access from Fibre Channel initiator devices to SCSI storage devices using the native low level, block protocol in accordance with the configuration." *See* '972 Patent, at Claims 1 and 10. This language adequately describes what it means to "process data in the buffer" for these claims. Simply because the specification may use slightly different language to describe this "processing," *see id.* at 5:18 - 5:20, does not entitle the defendants to adopt the specification language over the plain language of the claims. The Court will not further define this phrase.

VII. "storage router"

This term is used in claims 1-7 and 10 of the '972 patent. The plaintiff argues the term needs no further definition for claims 1-6, and for claim 7 it should be defined as "a device which provides virtual local storage, maps, implements access controls, and allows access using native low level block protocols." *See* Plaintiff's Brief, at 27. The defendants contend the term should mean "a bridge device that connects a Fibre Channel link directly to a SCSI bus and enables the exchange of SCSI command set information between application clients on SCSI bus devices and the Fibre Channel links." *See* Defendants' Brief, Ex. 2.

The defendants do not make any argument for their proposed definition in their brief, and did not discuss the term at the July 25 hearing. In their notebook of exhibits presented at the hearing, the defendants include one page which supports their definition with a quote from the specification. *See* Defendants' *Markman* Exhibits, "Markman Presentation" Tab, at 22. This argument is disingenuous. The specification language quoted by the defendants is immediately followed by several sentences further defining "storage router." Indeed, the next sentence begins "Further, the storage router applies access controls . . . ." *See* '972 Patent, at 5:30. The defendants' attempt to limit the term "storage router" to one of several descriptive sentences in the specification is not well-taken. In addition, the Court finds the term "storage router," as used in all claims of the '972 patent, is adequately described by the additional language of the claims, which discloses in detail the various functions and/or qualities of the storage router. The Court will not further define this term.

VIII. "map"

This term is used in claims 1, 7, 10 and 11 of the '972 patent. The plaintiff contends the term means "to create a path from a device on one side of the storage router to a device on the other side of the router, *i.e.* from a Fibre Channel device to a SCSI device (or vice-versa). A 'map' contains a representation of devices on each side of the storage router, so that when a device on one side of the storage router wants to communicate to a device on the other side of the storage router, the storage router can connect the devices." *See* Plaintiff's Brief, at 22. The defendants argue the term means "to translate addresses." *See* Defendants' Brief, Ex. 2.

In support of their definition, the defendants point only to a dictionary definition of "map." *See* Defendants' Brief, at 13 and Ex. 4. The plaintiff, on the other hand, cites to specific portions of the specification that support its definitions of map (both as a verb and a noun) as used in the claims of the '972 patent. *See* Plaintiff's Brief, at 22 (citing '972 Patent, at 1:66 - 2:5 and 6:65 - 7:6). Because intrinsic evidence is far more salient than a dictionary definition, and because the Court agrees that the specification language cited by the plaintiff supports its construction of the term "map," the Court will adopt the plaintiff's proposed definition of this term.

IX. "Fibre Channel protocol unit" and "SCSI protocol unit"

These terms are used in claims 5 and 6 of the '972 patent. The plaintiff contends these phrases should be defined as "a portion of the Fibre Channel controller which connects to the Fibre Channel transport medium" and "a portion of the SCSI controller which interfaces to the SCSI bus." *See* Plaintiff's Brief, at 27. The defendants say the terms mean "block and equivalents thereof that connects to the Fibre Channel transport medium" and "block and equivalents thereof that connects to the SCSI bus transport medium." *See* Defendants' Brief, Ex. 2.

The defendants argue the means-plus-function analysis of § 112(6) should apply here because the terms are well-known and are not defined in two dictionaries cited by the defendants. *See* Defendants' Brief, at 7-8, 14-15, Ex. 4 and Ex. 5. However, the defendants do not indicate how the term should be defined in reference to the specification, and in fact contend "the '972 specification fails to reveal any structure corresponding to the claimed function." *See id.* at 8 and 15. The defendants then propose the word "block" should be used to describe these terms because the "protocol units" are "simply depicted as a block within the diagram of Figure 5" of the '972 patent. *See id.* This reasoning is wholly unpersuasive. Simply because a figure in the patent physically depicts the protocol units in a block-like shape, it does not follow that the units should be defined as "blocks or equivalents thereof." Under that reasoning, the SCSI storage devices, which are physically depicted as cylinders in the '972 patent, could be defined simply as "cylinders, oil drums or monkey barrels, or equivalents thereof." As the plaintiff correctly points out, the language of claims 5 and 6 plainly states that the "protocol units" for both devices are part of the "controllers" for the devices, and are intended to "connect" the devices to various "transport media" (*i.e.*, to various cables). *See* '972 Patent, at Claims 5 and 6. Accordingly, the Court adopts the plaintiff's definitions for these terms, and will construe the terms to mean "a portion of the Fibre Channel controller which connects to the Fibre Channel transport medium" and "a portion of the SCSI controller which interfaces to the SCSI bus."

X. "interface"

In their Joint Stipulation of Claim Construction, the parties claim the meaning of the term "interface" is in dispute. However, this phrase is not discussed in any of the parties' briefs, and neither side presented an argument at the July 25 hearing as to why the term is disputed. This term has a standard and ordinary meaning—even to a federal judge—and the Court will not further define it.

XI. Undisputed Terms

Finally, in their Joint Stipulation of Claim Construction, the parties have stipulated to the construction of 17 other terms in the '972 patent. The Court will therefore adopt these stipulated constructions, solely for the purpose of this lawsuit.

Accordingly, the Court enters the following order:

IT IS ORDERED that the attached construction of the patent claims will be incorporated into any jury instructions given in this cause and will be applied by the Court in ruling on the issues raised in summary judgment.

SIGNED on this 26th day of July 2000.

Sam Sparks
UNITED STATES DISTRICT JUDGE

CONSTRUCTION OF CLAIMS
U.S. PATENT NO. 5,941,972

Disputed Terms

The phrase "implements access controls for storage space on the SCSI storage devices" means provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device.

The phrase "allocation of subsets of storage space to associated Fibre Channel devices, wherein each subset is only accessible by the associated Fibre Chanel device" means subsets of storage space are allocated to specific Fibre Channel devices.

A "supervisor unit" is a microprocessor programmed to process data in a buffer in order to map between Fibre Channel devices and SCSI devices and which implements access controls.

A "SCSI storage device" is any storage device including, for example, a tape drive, CD-ROM drive, or a hard disk drive that understands the SCSI protocol and can communicate using the SCSI protocol.

The term "map" means to create a path from a device on one side of the storage router to a device on the other side of the router, *i.e.* from a Fibre Channel device to a SCSI device (or vice-versa). A "map" contains a representation of devices on each side of the storage router, so that when a device on one side of the storage router wants to communicate with a device on the other side of the storage router, the storage router can connect the devices.

A "Fibre Channel protocol unit" is a portion of the Fibre Channel controller which connects to the Fibre Channel transport medium.

A "SCSI protocol unit" is a portion of the SCSI controller which interfaces to the SCSI bus.

Stipulated / Undisputed Terms

A "buffer" is a memory device that is utilized to temporarily hold data.

A "direct memory access (DMA) interface" is a device that acts under little or no microprocessor control to access memory for data transfer.

A "Fibre Channel" is a known high-speed serial interconnect, the structure and operation of which is described, for example, in Fibre Channel Physical and Signaling Interface (FC-PH), ANSI X3.230 Fibre Channel Arbitrated Loop (FC-AL), and ANSI X3.272 Fibre Channel Private Loop Direct Attach (FC-PLDA).

A "Fibre Channel controller" is a device that interfaces with a Fibre Channel transport medium.

A "Fibre Channel device" is any device, such as a computer, that understands Fibre Channel protocol and can communicate using Fibre Channel protocol.

"Fibre Channel protocol" is a set of rules that apply to Fibre Channel.

A "Fibre Channel transport medium" is a serial optical or electrical communications link that connects devices using Fibre Channel protocol.

A "first-in-first-out queue" is a multi-element data structure from which elements can be removed only in the same order in which they were inserted; that is, it follows a first in, first out (FIFO) constraint.

A "hard disk drive" is a well known magnetic storage media, and includes a SCSI hard disk drive.

An "initiator device" is a device that issues requests for data or storage.

"Maintain(ing) a configuration" means keep(ing) a modifiable setting of information.

A "native low level, block protocol" is a set of rules or standards that enable computers to exchange information and do not involve the overhead of high level protocols and file systems typically required by network servers.

A "SCSI" (Small Computer System Interface) is a high speed parallel interface that may be used to connect components of a computer system.

A "SCSI bus transport medium" is a cable consisting of a group of parallel wires (normally 68) that forms a communications path between a SCSI storage device and another device, such as a computer.

A "SCSI controller" is a device that interfaces with the SCSI bus transport medium.

"Virtual local storage" is a specific subset of overall data stored in storage devices that has the appearance and characteristics of local storage.

A "workstation" is a remote computing device that connects to the Fibre Channel, and may consist of a personal computer.

EXHIBIT D

55 RECEIVED

MAR 1 0 2003

CLERK, U.S. DISTRICT COURT
WESTERN DISTRICT OF TEXAS
BY ______
DEPUTY CLERK

NOTE: Pursuant to Fed. Cir. R. 47.6, this disposition is not citable as precedent. It is a public record. This disposition will appear in tables published periodically.

United States Court of Appeals for the Federal Circuit

FILED
MAR 1 0 2003
CLERK, U.S. DISTRICT COURT
WESTERN DISTRICT OF TEXAS
BY ______
DEPUTY CLERK

02-1158

CROSSROADS SYSTEMS, (TEXAS), INC.,

Plaintiff-Appellee,

v.

CHAPARRAL NETWORK STORAGE, INC.,

Defendant-Appellant.

FILED
U.S. COURT OF APPEALS FOR THE FEDERAL CIRCUIT
FEB 1 2 2003
JAN HORBALY
CLERK

JUDGMENT

CERTIFIED COPY
I HEREBY CERTIFY THIS DOCUMENT IS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE.
UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT
By: ______ Date: 3/5/03

ON APPEAL from the	United States District Court for the Western District of Texas
In CASE NO(S).	00-CV-217 and 00-CV-621

This CAUSE having been heard and considered, it is

ORDERED and ADJUDGED: AFFIRMED. See Fed. Cir. R. 36

Per Curiam (NEWMAN, SCHALL, and DYK, Circuit Judges).

ENTERED BY ORDER OF THE COURT

DATED: FEB 1 2 2003

______
Jan Horbaly, Clerk

ISSUED AS A MANDATE: MARCH 5, 2003

Costs Against Appellant:
Total $97.35

186

03/17/2003 MON 12:47 [TX/RX NO 6273]

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/007,124	07/19/2004	6421753	I006-8930	2295

44654 7590 05/24/2005

SPRINKLE IP LAW GROUP
1301 W. 25TH STREET
SUITE 408
AUSTIN, TX 78705

EXAMINER	
Fleming, Fritz	
ART UNIT	PAPER NUMBER
2182	

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
90/007,124	07/19/2004	6421753	I006-8930

Larry E. Severin
Wang, Hartman & Gibbs, PC
1301 Dove Street
Suite 1050
Newport Beach, CA 92660

EXAMINER
Fleming, Fritz

ART UNIT	PAPER
2182	

DATE MAILED: 05/24/05

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

CC: SPRINKLE IP LAW GROUP
1301 W. 25th Street
Suite 408
Austin, TX 78705

PTO-90C (Rev.3-98)

Office Action in Ex Parte Reexamination	Control No. 90/007,124	Patent Under Reexamination 6421753	
	Examiner Fritz M. Fleming	Art Unit 2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

a☒ Responsive to the communication(s) filed on *06 April 2005* . b☐ This action is made FINAL.
c☒ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☒ Information Disclosure Statement, PTO-1449.
3. ☐ Interview Summary, PTO-474.
4. ☐ _____.

Part II SUMMARY OF ACTION

1a. ☒ Claims *1-8* are subject to reexamination.

1b. ☐ Claims _____ are not subject to reexamination.

2. ☐ Claims _____ have been canceled in the present reexamination proceeding.

3. ☐ Claims _____ are patentable and/or confirmed.

4. ☒ Claims *1-8* are rejected.

5. ☐ Claims _____ are objected to.

6. ☒ The drawings, filed on *7/19/2004* are acceptable.

7. ☐ The proposed drawing correction, filed on _____ has been (7a)☐ approved (7b)☐ disapproved.

8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some* c)☐ None of the certified copies have

   1☐ been received.

   2☐ not been received.

   3☐ been filed in Application No. _____ .

   4☐ been filed in reexamination Control No. _____.

   5☐ been received by the International Bureau in PCT application No. _____.

   * See the attached detailed Office action for a list of the certified copies not received.

9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.

10. ☐ Other: _____

FRITZ FLEMING
PRIMARY EXAMINER
GROUP 2100

cc: Requester (if third party requester)

Reexamination

1. In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, which will be strictly enforced.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extension of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

A shortened statutory period for response to this action is set to expire **2 months from the mailing date of this letter.**

1. The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 6,421,753 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

2. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

It is to be noted that claim 4 has the phrase "using native low level, block protocols", which per the interview for 90/007127, distinguishes over the art of record used in the first office action. It is to be noted that claim 1 does not have this limitation. However, instead of being able to close out prosecution with this action, a new non-final action is being issued. This is due to the filing of the IDS after the mailing date of the first office action. Had this information, namely the Spring (UK GB 2297636), been filed prior to the first office action, these issues would have been taken into account in the first office action. Since there was no statement similar to that of 37 CFR 1.97(e), an action based solely upon art cited by the patent owner could have been made final, even when the claims are not amended (see below). Since the art cited by the patent owner led to the discovery of other references used in this rejection, this action cannot be made final, but does certainly delay a final action on the claimed subject matter.

MPEP 2171:

III. ART CITED BY PATENT OWNER DURING PROSECUTION

Where art is submitted in a prior art citation under 37 CFR 1.501 and/or 37 CFR 1.555 (an IDS filed in a reexamination is construed as a prior art citation) and the submission is not accompanied by a statement similar to that of 37 CFR 1.97(e), the examiner may use the art submitted and make the next Office action final whether or not the claims have been amended, provided that no other new ground of rejection is introduced by the examiner based on the new art not cited in the prior art citation. See MPEP § 706.07(g).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1,4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spring (UK GB 2297636—Spring) in view of Oeda et al. (Oeda) and Cummings.

Starting with the independent claim 7, one finds an apparatus per Figure 1 comprising a plurality of user workstations (USER 1-4 each having15-18), a corresponding plurality of first transport medium (un-numbered) connecting the USERS to the storage router (server 20), which in turn is connected to a plurality of storage devices in the form of drives 1-5 (21-25) via a corresponding set of second transport medium (again un-numbered). Thus the storage router (server 20) interfaces between the workstations and the storage devices, as shown in detail in Figure 2, wherein the processor 28 controls the USER interface circuits 26 and the disk drive interface circuits 27. The internal memory 29 provides programmed instructions for the processor 28. The storage router (server 20) is connected to each USER via a SCSI interface, and in turn to the emulated SCSI drive (drives 21-25). See for example, pages 5-7. Thus, an apparatus for providing virtual local storage (at drives 21-25) on remote storage devices (21-25 are remote from workstations 15/16) connected to one transport medium (the non-numbered connections from the shared file server 20 to the drives 21-25) to devices (workstations 15/16, of which 4 are shown) connected to another transport medium (the un-numbered connections between the workstations 15/16 and the file server 20) is shown in Figure 1. The method of providing virtual local storage is set forth at page 3, wherein it is disclosed that a method of storing data at a large storage volume which emulates (hence makes virtual) a plurality of removable disc drives (the local storage). See also page 10, lines 1-3, wherein step 34 describes a data transfer in which the local operating software **may read and write to logical drives as if they were local removable disc drives**, thereby anticipating the virtual local storage, as the drives themselves are remote to the users, but appear to the user's as the conventional local removable disc drives, and hence virtual local storage as logical drives emulate (i.e. virtual) the removable disc drives (the local storage). Thus the storage router (server 20) interfaces with the first and second transport medium and provides the virtual local storage to the USERS. There is a mention of a look up table (68) for each logical drive, but such is not the mapping between the workstations and storage devices as claimed, noting that USERS access logical drives. The implementing of access controls is clearly described throughout the disclosure, especially noting that each USER has access to a large number of removable disc drives (see page 7, lines 18-27), thereby teaching the implementation of some sort of access controls, with the storage router (server 20) determining if the requested drive is available, and if so, granting access to the requesting workstation (see page 8, lines 10-17). Thus the access is ultimately controlled and allowed by the storage router (server 20). All of this is done by native low level, block protocol (NLLBP), as the only protocol used from the USERs to the storage router and by the storage router (server 20) is that of the SCSI protocol, such being selected so that the storage router (server 20) will return data back to the USER via the SCSI protocol (page 8, lines 10-17), as the processor 15 (of a USER) issues commands over the SCSI interface (page 8 lines 4-9). Per page 12, lines 14-26, the local operating system of the USER (62) thinks it is accessing a conventional SCSI drive via communications over a conventional SCSI interface to the storage router SCSI interface (65), wherein the communication conforms to establish SCSI protocols without having to embed network software within the workstations. Furthermore, the server operating system (66) converts the SCSI sector definitions into physical data blocks for each logical drive, such that the server operating system (60) emulates an SCSI disc drive per Figure 5. Finally note that the storage router (server 20) grants access to an emulated logical disc drive (page 9, lines 17-19) via mount and dismount commands (pages 9 and 10) and that the storage router (server 20) has to keep track of user created blocks, such that the USER is presented with a user interface allowing existing logical drives to be selected **as well as new logical drives to be defined** (page 12, lines 9-13), all via the use of the SCSI NLLBP, which certainly represents the storage router (server 20) being capable of configuring the SCSI drives to contain at least a portion of the virtual storage. Communications between the USERS and the storage router (server 20) is implemented using established protocols, preferred to be SCSI, which is in turn, the claimed use of the NLLBP, as this is used from the USER to the storage router to the disc drives. While look up tables and keeping track of USER blocks is mentioned, this does not set forth a mapping between the workstations and the storage devices, noting that Spring is using logical drives for the USERs.

In the same field of endeavor, Oeda et al. (Oeda) teaches that it is old and well known per Figure 4 to have a plurality of HOSTs (i.e. 1A,B) connected to a SCSI bus (2), which is then in turn connected to a disk controller (5) and a disk drive unit (4). Per Figure 4, it is clearly shown that the disk drive (4) is divided into subsets mapped to the HOSTs, wherein HOST 1A is only allowed to access its partition (41), HOST 1B is only allowed to access its partition (42), and either HOST is granted a shared read only access to the shared partition (43). The partitions (41-43) are assigned to the HOSTs as is shown, with the purpose of the assigned partitions avoiding erroneous partition access and data destruction (column 7, line 53-column 8, line 30). Thus a mapping between workstations (in the form of HOSTs) and the assigned partitions (41-43) is clearly shown, such that a HOST 1A can only request partitions 41 and 43 (the implementing of storage area access controls), and is prevented from erroneously accessing the Host 1B partition 42 (see column 8, lines 13-16), which is the ultimate allowing of access to only those partitions of the storage area for which access control has been mapped. Furthermore, the disk controller (5 and functioning as a storage router) performs exclusive control between the HOSTs and the drive per Figure 2, wherein the SCSI CONTROL LSI has the ID REGISTERS (71-73) which contains the DEVICE IDs and thus compares the requested device ID by a HOST to the stored IDs and grants or denies access based upon the mapping of Figure 4. Since each partition has a SCSI ID, each partition is a seen as a logical drive (and can be assigned different logical unit numbers – LUNs – column 6, lines 34-37), as the HOST sees three separate disk storage devices.

The protocol used is that of the SCSI standard, with the 7 phases set forth at column 5, again showing that access from the HOSTs to the storage router (i.e. the disk controller 5 as it performs the mapping, access controls, and granting of access) to the disk drive unit (4) is exclusively SCSI, thus exhibiting the use of a NLLBP as claimed.

In the same field of endeavor, Cummings teaches the use of a fibre channel based system architecture to provide the transport mechanism for multiple user station access to the "Disk array and tape library" using the same protocols (i.e. SCSI) as if they were connected to the user's local workstation. See Figure 2 and pages 253-254. Thus virtual local storage is provided by a remote disk array and this array is accessed by the same SCSI protocol as though it were locally connected. Therefore, it is clear that SCSI, a NLLBP, is used from end to end, as fibre channel has SCSI protocol, as well as others, mapped to it (page 253). Advantages gained are the use of a single channel, a distance independent transport mechanism, and remote storage that is indistinguishable from the local disk storage (page 254). Since access is via SCSI protocol, it is thus obvious that the "Disk array with storage manager" of Figure 2 requires a fibre channel controller interface to interface with the fibre channel leading to it, as well as a SCSI interface for the array, as the array is accessed with the SCSI protocol. But at the top level, Cummings clearly shows a fibre channel transport medium that is used to interface the user workstations to the "disk array with storage manager" and that the "disk array with storage manager" is SCSI based as that is the protocol used to access it. Note also that the concept of private and shared storage are mentioned at page 255, thereby setting forth motivation to combine with references that teach SCSI based private and shared storage.

Therefore it would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify Spring 636 in view of Oeda and Cummings for the express purpose of providing a plurality of USERs/HOSTs mapped and controlled access to assigned partitions in order to avoid erroneous disk access and data destruction in a distance independent fibre channel based transport medium carrying the end to end SCSI protocol NLLBP. It is to be noted that this combination is expressly taught by Spring '636 at page 7, lines 3-17, in that more robust connections may be needed in order to provide for greater separation from the users to the disks. Thus the use of the fibre channel transport medium of Cummings teaches the use of the fibre channel to carry the SCSI based protocol functionality of Spring '636 and Oeda such that the virtual local storage can be separated from the users by a greater distance than achieved by SCSI alone, without changing the use of the SCSI protocol (end to end) and making the disk storage array appear exactly as if it were locally connected. In combination, each USER/HOST is granted access to only its subset partition (i.e. logical disk) to which it is mapped. The USERs are a plurality of workstations, and the storage devices are a plurality of disc drives, noting that Oeda supports an array of drives (17) divided into partitions (171-173) such that it performs as a RAID, as does SPRING '636, with each device seen by a HOST independent from one another (Oeda columns 6 and 7). Thus when combined, the plurality of disc drives are divided into partitions mapped to specific USERs/HOSTs, so that access is controlled and granted via the mapping, performed by the storage router (the combined server 20 and disk controller 5). The claims only require fibre channel and SCSI bus transport medium and interfacing thereto, which the combined references teach. The indicated claims require only the top-level interfacing and require no details of the fibre channel or SCSI controllers. Thus the SCSI storage devices are accessed in a mapped and access controlled manner via the SCSI that is carried over the fibre channel transport medium, and the interfacing will occur at the disk array with storage manner, which would be the server (20) of Spring '636 and the disk controller (5) of Oeda, such that the user devices (i.e. HOSTs) on the fibre channel will be mapped to the appropriate SCSI partitions on the disk array using the SCSI protocol carried over the fibre channel bus transport medium. The user workstations are the initiators on the fibre channel bus transport medium.

As far as claim 4 is concerned, the method limitations are rendered obvious by the combined teachings of Spring '636 in view of Oeda and Cummings. Combined, Spring '636 in view of Oeda and Cummings set forth the method by which the fibre channel USERs/HOSTs are interfaced with the SCSI disk drives (storage) such that the storage router (the combined teachings of the server 20 and the disk controller 5) provides the claimed mapping, implementing of the access controls, and the allowing access using only the SCSI protocol, which is a NLLBP, via the fibre channel transport medium, which requires an interfacing to the fibre channel and SCSI transport medium at the "disk array with storage manager."

7. Claims 2,3,5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spring '636 in view of Oeda and Cummings as applied to claims 7-9 and 11-14 above, and further in view of Jibbe et al. (Jibbe) and Crouse et al. (Crouse).

Spring '636 in view of Oeda and Cummings set forth the use of a storage router to provide mapping, access control and access granting of fibre channel USER/HOST requests to the SCSI storage disks. Per Spring '636, the server (20) has interfaces (26,27), a CPU (28) connected to the interfaces, and a memory for CPU instructions (29), using SCSI protocol (a

NLLBP) end to end. See Figure 2. Per Oeda, the disk controller (5) provides mapping and access control and granting based upon the SCSI CONTROL LSI (6) and the ID REGISTERS (71-73) from the HOSTs (1A,B) to the disk(s) (either 4 or the array17) using the SCSI protocol (a NLLBP) end to end. Per Cummings, it is taught to use the distance independent fibre channel transport medium to carry the end-to-end SCSI protocol user to remote storage requests as though the storage were locally connected. What is lacking is the specific detail of the fibre channel HOST to SCSI DISK controller and a buffer for providing memory work space for the storage router.

In the same field of endeavor, Jibbe teaches that it is old and well known to use a SCSI-SCSI controller for HOST to disk array access. See for example, Figure 1, which sets forth the use of a microprocessor (51) coupled to the HOST SCSI interface controller 14 and the SCSI disk drive interface controllers (31-35), such that the microprocessor controls the interfaces (column 4, lines 1-9). The SCSI Array Data Path Chip (ADP 10) interconnects the SCSI data bus (16) with the SCSI data busses (21-25), and is also under the control of the microprocessor controller (51). The DMA FIFO BLOCK 70 holds data received from the host until the array is ready to accept it and to hold data from the disk array until the host is ready to accept it (column 5, lines 14-21). The DMA interface (14) is coupled to the FIFO (70) as well as the first protocol unit (SCSI adapter 14), such that the HOST SCSI adapter (i.e. a first controller) is operable to pull data from and place data into the FIFO (70), with the second controllers (SCSI interfaces 31-35) operable to pull data from and place data into the FIFO (70), under the control of the supervisory unit (microprocessor 51) and its bus (53) that couples it to the interface controllers (14 and 31-35). The memory (36) is a 64kByte SRAM that provides memory workspace during read/modify/write operations of RAID 5 and is also coupled to the microprocessor/supervisor (51) via the ADP (10). Thus the memory (36) and the FIFO (70) provide memory work space for the array controller and allows the microprocessor/supervisor (51) to process data stored therein to allow a HOST to interface with the disk storage. In summary, Jibbe teaches a supervisor unit 51 coupled to first and second controllers (14 and 31-35), an ADP (10) and buffers (36 and 70), such that the supervisory unit controls the controllers and buffers and the ADP for the express purpose of configurability between RAID 1,3-5 levels, as well as the use of the FIFO buffers for holding data until the host/disk drives are ready. The Host DMA interface (14) is coupled to the SCSI controller (14) and the FIFO buffers/queues (70/101-105) and the buffer (36—internal to the Figure 1 disk array controller). . It is also expressly taught that the data path architecture can be constructed with ESDI, IPI or EISA devices rather than with SCSI devices (column 11, lines 40-43).

Building on Jibbe's express suggestion to construct the data path architecture with devices other than SCSI, one finds that Crouse teaches a data server that uses a fibre channel user node transport bus medium (12b) and SCSI storage devices (46 and 48) that encompass both online and removable. Note the use of DMA and buffers in Figure 4a/b. The goal is improved data transfer architecture (column 3, lines 23-41) via a pipelined data server, to include removable and online storage devices.

Therefore it would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify Spring '636 in view of Oeda and Cummings by the teachings of Jibbe and Crouse in order to provide for increased RAID functionality via the SCSI disk array controller details, which in turn provide for configurability between various RAID levels (certainly desirable as both Spring '636 and Oeda are concerned with various RAID levels), as well as the ability to buffer data until the host/disks are ready, with the requisite details of the fibre channel to SCSI interfacing required by Cummings and shown by Crouse. The combination is proper as Spring '636 and Oeda use SCSI controllers between the host and disk(s) and RAID configurations. Spring '636 even lays out the same basic functionality as Jibbe's array controller in the storage router (server 20), with the required ability to interface with the host and disks via the SCSI protocol. Oeda also provides host to disk interfacing with mapping, access control and access granting in a SCSI protocol environment. Thus Jibbe provides the details of a SCSI disk array controller needed by Spring '636 and Oeda, and the combined teachings of Spring '636 and Oeda and Cummings and Jibbe and Crouse render the claims obvious per the above analysis. Admissions made into the record of 90/007,127 by the patent owner bolster an obviousness rejection, as at page 10 of the response dated 4/6/2005, the record clearly states that various protocol (not even mentioned in the specification, but only appearing in the claims) represent protocols that **CAN** encapsulate SCSI commands, would be understood by those in the art. This statement is an attempt to provide support for claimed protocols not mentioned in the specification. Using the same rationale, then it would have been obvious to one of ordinary skill in the art to use any protocol capable of encapsulating SCSI, and any hardware associated with the use of these other protocols, as the patent owner has stated that one would recognize such. Thus this admission, coupled with Spring '636 desire to use a more robust protocol when extending the distance between the workstations and the disk drive storage, and Cummings' teaching that fibre channel is distance independent and Jibbe's express teaching that other devices than SCSI can be used and Crouse's teaching of a fibre channel to SCSI data server controller interfacing, then the claimed subject matter is rendered obvious and is certainly within the ordinary skill in the art, and the references themselves express a motivation for the combination of references, thereby avoiding the issue of impermissible hindsight.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz M. Fleming whose telephone number is 571-272-4145. The examiner can normally be reached on M-F, 0600-1500.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Any fax should be sent to the CRU at 571-273-0100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fritz M Fleming
Primary Examiner
Art Unit 2182

fmf

JEFFREY GAFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

PINCHUS M. LAUFER, PH.D.
SPECIAL PROGRAM EXAMINER
TECHNOLOGY CENTER 2100

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
INFORMATION DISCLOSURE STATEMENT BY APPLICANTS	Atty. Docket No. (Opt.) **CROSS1121-15**

Applicants **Geoffrey B. Hoese et al.**	
Application Number **90/007,124**	Filed **07/19/2004**
For **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **2182**	Examiner **Fleming, Fritz M.**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

Certification Under 37 C.F.R. §1.8

I hereby certify that this document is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313 on **March 24, 2005.**

Janice Pampell
Janice Pampell

Applicants respectfully request, pursuant to 37 C.F.R. §§ 1.555, 1.56, 1.97 and 1.98, that the art listed on the attached SBO8-A and SBO8-B forms be considered and cited in the examination of the above-identified reexamination application. Since the present Application was filed after June 30, 2003, a copy of any U.S. Patent and any U.S. Patent Application Publications cited on the attached SBO8-A form is not being submitted with this Information Disclosure Statement pursuant to the waiver of 37 C.F.R. § 1.98(a)(2)(i) by the U.S. Patent and Trademark Office. Several documents are included on the enclosed CD-Rom for the convenience of the Examiner. If the Examiner would like hard copies of these documents, we will gladly provide them.

Furthermore, pursuant to 37 C.F.R. §§ 1.97(g) and (h), no representation is made that a search has been made or that this art is material to patentability of the present application. Applicants respectfully submit that the claims of Applicants' above-referenced patent is patentably distinguishable from these references. Applicants respectfully request consideration of these references. The Commissioner is hereby authorized to charge any fees due, or refund any credit, to Deposit Account No. 50-3183 of Sprinkle IP Law Group for any fee under 37 C.F.R. §1.17.

Respectfully submitted,

Sprinkle IP Law Group
Attorneys for Applicants

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Dated: March 24, 2005

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PTO/SB/08A (04-03)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT				
			Application Number	90/007,124
			Filing Date	07/19/2004
			First Named Inventor	Hoese, Geoffrey
			Group Art Unit	2182
			Examiner Name	Fleming, Fritz M.
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number: Number	Document Number: Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines Where Relevant Passages or Figures Appear
FMF	A1	3,082,406		03/19/1963	L.D. Stevens	
	A2	4,092,732		05/30/1978	Ouchi	
	A3	4,695,948		09/22/1987	Blevins, et al.	
	A4	4,751,635		06/14/1988	Kret	
	A5	4,864,532		09/05/1989	Reeve, et al.	
	A6	4,947,367		08/07/1990	Chang, et al.	
	A7	5,072,378		12/10/1991	Manka	
	A8	5,163,131		11/10/1992	Row, et al.	
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	A16	5,530,845		06/25/1996	Hiatt, et al.	
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	A19	5,596,562		06/21/1997	Chen	
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	A22	5,680,556		10/21/1997	Begun, et al.	
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	A26	5,743,847		04/28/1998	Nakamura, et al.	
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	A28	5,774,683		06/30/1998	Gulick	
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FMF	A33	5,884,027		03/16/1999	Garbus, et al.	
	A34	5,913,045		06/15/1999	Gillespie, et al.	
	A35	5,923,557		07/13/1999	Eidson	
	A36	5,941,969		08/24/1999	Ram, et al.	
	A37	5,953,511		09/14/1999	Sescilia, et al.	
	A38	5,974,530		10/26/1999	Young	
	A39	5,978,379		11/02/1999	Chan, et al.	
	A40	5,991,797		11/23/1999	Futral, et al.	
	A41	6,000,020		12/07/1999	Chin, et al.	
	A42	6,021,451		02/01/2000	Bell, et al.	
	A43	6,065,087		05/16/2000	Keaveny, et al.	
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	A45	6,131,119		10/10/2000	Fukui	
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	A47	6,141,737		10/31/2000	Krantz, et al.	
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	A49	6,209,023		03/27/2001	Dimitroff, et al.	
	A50	6,223,266		04/24/2001	Sartore	
	A51	6,260,120		07/10/2001	Blumenau, et al.	
	A52	6,330,629		12/11/2001	Kondo et al.	
	A53	6,341,315		01/22/2002	Arroyo, et al.	
	A54	6,343,324		01/29/2002	Hubis et al.	
	A55	6,363,462		03/26/2002	Bergsten	
	A56	6,421,753		07/16/2002	Hoese, et al.	
	A57	6,425,035		07/23/2002	Hoese, et al.	
	A58	6,425,036		07/23/2002	Hoese, et al.	
	A59	6,484,245		11/19/2002	Sanada, et al.	
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Examiner Initials		FOREIGN PATENT DOCUMENTS Country Code Number	Kind Code (if known)	Publication Date MM-DD-YYYY (Number 43)	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines Where Relevant Passages or Figures Appear
FMF	B1	GB 2296798	A	07/10/1996	Spring Consultants Limited	
	B2	GB 2297636	A	08/07/1996	Spring Consultants Limited	
	B3	JP 8-230895		09/10/1996	Kikuchi, et al.	
	B4	EP 0810530	A2	12/03/1997	Sun Microsystems, Inc.	
	B5	EP 0827059	A2	03/04/1998	NEC Corporation	
	B6	WO 99/34297	A1	07/08/1999	Crossroads Systems, Inc.	
	B7	GB 2341715				
FMF	B8	JP 6301607				
Examiner Signature		Fritz M. Fleming		Date Considered	5/23/2005	

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Examiner Initials	Cite No.	OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS	Date
FMF	C1	CRD-5500 SCSI RAID Contr4oller User's Manual CMD Technology, Inc. pp. 1-1 to 6-25, revised November 21, 1996	11/21/1996
	C2	Black Box, SCSI Fiberoptic Extender, Single-Ended, Product Insert, 2 pages, 1996.	6/18/1905
	C3	CRD-5500, RAID DISK ARRAY CONTROLLER Product Insert, pp. 1-5	
	C4	CRD-5500, SCSI RAID CONTROLLER OEM Manual, Rev. 1.3, February 26, 1996, pp. 1-54.	02/26/1996
	C5	Raidtec FibreArray and Raidtec FlexArray UltraRAID Systems", Windows IT PRO Article, October 1997.	
	C6	DIGITAL Storage Works, HSZ70 Array Controller, HSOF Version 7.0 EK-HSZ70-CG. A01, Digital Equipment Corporation, Maynard, Massachusetts.	
	C7	DIGITAL StorageWorks HSZ270 Array Controller HSOF Version 7.0 EK-HSZ270-RM. A01. CLI Reference Manual	
	C8	DIGITAL StorageWorks, Using Your HSZ70 Array Controller in a SCSI Controller Shelf (DS-BA356-M Series), User's Guide, pp. 1-1 through A-5 with index, January 1998.	
	C9	DIGITAL Storageworks HSG80 Array Controller ACS Version 8.0 (User's Guide) 1/98	
	C10	DIGITAL StorageWorks HSZ70 Array Controller HSOF Version 7.0 EK-HSZ70-SV. A01	
	C11	Emerson, "Ancor Communications: Performance evaluation of switched fibre channel I/O system using--FCP for SCSI" February 1995, IEEE, pp. 479-484.	02/01/1995
	C12	IBM Technical Publication: Magstar and IBM 3590 High Performance Tape Subsystem Technical Guide, November 1996, pp. 1-269.	
	C13	Guide to Sharing and Partitioning IBM Tape Library Dataservers, November 1996, IBM, International Technical Support Organization, San Jose Center	
	C14	Misc. Reference Manual Pages, SunOS 5.09.	
	C15	Block-Based Distributed File Systems, Anthony J. McGregor, July 1997.	
	C16	Infoserver 100 System Operations Guide, First Edition Digital Equipment Corporation, 1990	
	C17	S.P. Joshi, "Ethernet controller chip interfaces with variety of 16-bit processors," electronic Design, Hayden Publishing Co., Inc., Rochelle Park, NJ, October 14, 1982, pp 193-200	10/14/1982
	C18	DP5380 Asynchronous SCSI Interface, National Semiconductor Corporation, Arlington, TX, May 1989, pp. 1-32	
FMF	C19	Johnson, D.B., et al., The Peregrine High Performance RPC System", Software-Practice and Experience, 23(2):201-21, Feb. 1993	

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FMF	C20	InfoSrver 150—Installation and Owner's Guide", EK-INFSV-0M-001, Digital Equipment Corporatino, Maynard, Massachusetts 1991, Chapters 1 and 2	
	C21	InfoServer 150VXT Photograph	
	C22	Pictures of internal components of the InfoServer 150, taken from http://bindarydinosaurs.couk/Museum/Digital/infoserver/infoserver.php in Nov. 2004.	
	C23	Simplest Migration to Fibre Channel Technology, Article, Digital Equipment Corporation, November 10, 1997, published on PR Newswire	11/10/1997
	C24	Compaq Storageworks HSG80 Array Controller ACS Version 8.3 (Maintenance and Service Guide) 11/98	
	C25	Compaq Storageworks HSG80 Array Controller ACS Version 8.3 (Configuration and CLI Refeence Guide) 11/98	
	C26	Office Action dated 01/21/03 for 10/174,720 (CROSS1120-8).	01/21/2003
	C27	Office Action dated 02/27/01 for 09/354,682 (CROSS1120-1).	02/27/2001
	C28	Office Action dated 08/11/00 for 09/354,682 (CROSS1120-1).	08/11/2000
	C29	Office Action dated 12/16/99 for 09/354,682 (CROSS1120-1).	12/16/1999
	C30	Office Action dated 11/06/02 for 10/023,786 (CROSS1120-4).	11/06/2002
	C31	Office Action dated 01/21/03 for 10/081,110 (CROSS1120-5).	01/21/2003
	C32	Office Action dated 1/27/2005 in 10/658,163 (CROSS1120-13)	02/27/2005
	C33	Office Action in Ex Parte Reexamination 90/007,127, mailed 0207/05.	02/07/2005
	C34	Office Action in Ex Parte Reexamination 90/007,126, mailed 0207/05.	02/07/2005
	C35	Office Action in Ex Parte Reexamination 90/007,125, mailed 02/07/05.	02/07/2005
	C36	Office Action in Ex Parte Reexamination 90/007,124 mailed 02/07/05	02/07/2005
	C37	Office Action in Ex Parte Reexamination 90/007,123, mailed 0207/05.	02/07/2005
	C38	European Office Action issued April 1, 2004 in Application No. 98966104.6-2413	04/01/2004
		Copies of the following are on the attached CD-Rom	
	C39	Defendant's First Supplemental Trial Exhibit List, Crossroads Systems, Inc., v. Chaparral Network Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001). **(CD-Rom)**.	
	C40	Defendant's Third Supplemental Trial Exhibit List, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001) **(CD-Rom)**.	
	C41	Defendant's Trial Exhibits, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001). **(CD-Rom)**.	
FMF	C42	Defendants' Trial Exhibits, Crossroads Systems, Inc., v. Chaparral Network Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001). **(CD-Rom)**.	

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Examiner Initials	Cite No.	OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS	Date
FMF	C43	Defendant Chaparral Network Storage, Inc.'s First Supplemental Trial Exhibit List (D1 through D271) (**CD-ROM** Chaparral Exhibits ExList_Def).	9/2/2001
	C44	Defendant Pathlight Technology Inc.'s Third Supplemental Trial Exhibit List (CD-ROM Pathlight Exhibits ExList_Def).	
	C45	Plaintiff's Fourth Amended Trial Exhibit List, Crossroads Systems, Inc. v. Chaparral Network Storage, Inc, C.A. No. A-00CA-217-SS (W.D. Tex. 2001) (**CD-Rom**).	9/11/2001
	C46	Plaintiff's Revised Trial Exhibit List, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001). (**CD-Rom**).	
	C47	Plaintiff's Trial Exhibits, Crossroads Systems, Inc. v. Chaparral Networks Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001). (**CD-Rom**).	
	C48	Plaintiff's Fourth Amended Trial Exhibit List (**CD-ROM** Chaparral Exhibits ExList_Plaintiff).	9/11/2001
	C49	Plaintiff's Revised Trial Exhibit List (**CD-ROM** Pathlight Exhibits ExList_Plaintiff).	
	C50	Trial Transcripts, Crossroads Systems, Inc. v. Chaparral Network Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001) (**CD-Rom**).	
	C51	Trial Transcripts, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001). (**CD-Rom**).	
	C52	Trial Exhibits and Transcripts, Crossroads v. Chaparral, Civil Action No. A-00CA-21755, W.D. Tex. 2000 (**CD-Rom** and hard copy printouts).	
	C53	Snively, "Sun Microsystem Computer Corporation: Implementing a fibre optic channel SCSI transport" 1994 IEEE, February 28, 1994, pp. 78-82.	
	C54	Datasheet for CrossPoint 4100 Fibre Channel to SCSI Router (Dedek Ex 41 (ANCT 117-120)) (**CD-ROM** Chaparral Exhibits D012).	
	C55	Symbios Logic- Software Interface Specification Series 3 SCSI RAID Controller Software Release 02.xx (Engelbrecht Ex 2 (LSI 1421-1658)) (**CD-ROM** Chaparral Exhibits D013).	12/3/1997
	C56	Press Release- Symbios Logic to Demonstrate Strong Support for Fibre Channel at Fall Comdex (Engelbrecht 12 (LSI 2785-86)) (**CD-ROM** Chaparral Exhibits D016).	11/13/1996
	C57	OEM Datasheet on the 3701 Controller (Engelbrecht 13 (LSI 01837-38)) (**CD-ROM** Chaparral Exhibits D017).	6/17/1905
FMF	C58	Nondisclosure Agreement Between Adaptec and Crossroads Dated 10/17/96 (Quisenberry Ex 25 (CRDS 8196)) (**CD-ROM** Chaparral Exhibits D020).	10/17/1996

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Examiner Initials	Cite No.	OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS	Date
FMF	C59	Organizational Presentation on the External Storage Group (Lavan Ex 1 (CNS 182242-255)) (**CD-ROM** Chaparral Exhibits D021).	4/11/1996
	C60	Bridge. C, Bridge Between SCSI-2 and SCSI-3 FCP (Fibre Channel Protocol) (**CD-ROM** Chaparral Exhibits P214).	
	C61	Bridge Phase II Architecture Presentation (Lavan Ex 2 (CNS 182287-295)) (**CD-ROM** Chaparral Exhibits D022).	4/12/1996
	C62	Attendees/Action Items from 4/12/96 Meeting at BTC (Lavan Ex 3 (CNS 182241)) (**CD-ROM** Chaparral Exhibits D023).	4/12/1996
	C63	Brooklyn Hardware Engineering Requirements Documents, Revision 1.4 (Lavan Ex 4 (CNS 178188-211)) (**CD-ROM** Chaparral Exhibits D024) by Pecone.	5/26/1996
	C64	Brooklyn Single-Ended SCSI RAID Bridge Controller Hardware OEM Manual, Revision 2.1 (Lavan EX 5 (CNS 177169-191)) (**CD-ROM** Chaparral Exhibits D025).	3/21/1996
	C65	Coronado Hardware Engineering Requirements Document, Revision 0.0 (Lavan Ex 7 (CNS 176917-932)) (**CD-ROM** Chaparral Exhibits D027) by O'Dell.	9/30/1996
	C66	ESS/FPG Organization (Lavan Ex 8 (CNS 178639-652)) (**CD-ROM** Chaparral Exhibits D028).	12/6/1996
	C67	Adaptec MCS ESS Presents: Intelligent External I/O Raid Controllers "Bridge" Strategy (Lavan Ex 9 (CNS 178606-638)). (**CD-ROM** Chaparral Exhibits D029).	2/6/1996
	C68	AEC-7313 Fibre Channel Daughter Board (for Brooklyn) Engineering Specification, Revision 1.0 (Lavan Ex 10 (CNS 176830-850)) (**CD-ROM** Chaparral Exhibits D030).	2/27/1997
	C69	Bill of Material (Lavan Ex 14 (CNS 177211-214)) (**CD-ROM** Chaparral Exhibits D034).	7/24/1997
	C70	AEC-. 4412B, AEC-7412/B2 External RAID Controller Hardware 0EM Manual, Revision 2.0 (Lavan Ex 15 (CNS 177082-123)) (**CD-ROM** Chaparral Exhibits D035).	6/27/1997
	C71	Coronado II, AEC-7312A Fibre Channel Daughter (for Brooklyn) Hardware Specification, Revision 1.2 (Lavan Ex 16 (CNS 177192-210)) (**CD-ROM** Chaparral Exhibits D037) by Tom Yang.	7/18/1997
	C72	AEC-4412B, AEC7412/3B External RAID Controller Hardware OEM Manual, Revision 3.0. (Lavan Ex 17 (CNS 177124-165)) (**CD-ROM** Chaparral Exhibits D036).	8/25/1997
	C73	Memo Dated 8/15/97 to AEC-7312A Evaluation Unit Customers re: B001 Release Notes (Lavan Ex 18 (CNS 182878-879)) (**CD-ROM** Chaparral Exhibits D038),	8/15/1997
	C74	Brooklyn Main Board (AES-0302) MES Schedule (Lavan Ex I9 (CNS 177759-763)) (**CD-ROM** Chaparral Exhibits D039).	2/11/1997
	C75	News Release-Adaptec Adds Fibre Channel Option to its External RAID Controller Family (Lavan Ex 20 (CNS 182932-934)) (**CD-ROM** Chaparral Exhibits D040).	5/6/1997
FMF	C76	AEC-4412B/7412B User's Guide, Rev. A (Lavan Ex 21) (**CD-ROM** Chaparral Exhibits D041).	6/19/1905

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	C77	Data Book- AIC-7895 PCI Bus Master Single Chip SCSI Host Adapter (Davies Ex 1 (CNS 182944-64)) (**CD-ROM** Chaparral Exhibits D046).	5/21/1996
	C78	Data Book- AIC-1160 Fibre Channel Host Adapter ASIC (Davies Ex 2 (CNS 181800-825)) (**CD-ROM** Chaparral Exhibits D047).	6/18/1905
	C79	Viking RAID Software (Davies Ex 3 (CNS 180969-181026)) (**CD-ROM** Chaparral Exhibits D048).	6/18/1905
	C80	Header File with Structure Definitions (Davies Ex 4 (CNS 180009-018)) (**CD-ROM** Chaparral Exhibits D049).	8/8/1996
	C81	C++ SourceCode for the SCSI Command Handler (Davies Ex 5 (CNS 179136-168)) (**CD-ROM** Chaparral Exhibits D050).	8/8/1996
	C82	Header File Data Structure (Davies Ex 6 (CNS 179997-180008)) (**CD-ROM** Chaparral Exhibits D051).	1/2/1997
	C83	SCSI Command Handler (Davies Ex 7 (CNS 179676-719)) (**CD-ROM** Chaparral Exhibits D052).	1/2/1997
	C84	Coronado: Fibre Channel to SCSI Intelligent RAID Controller Product Brief (Kalwitz Ex I (CNS 182804-805)) (**CD-ROM** Chaparral Exhibits D053).	
	C85	Bill of Material (Kalwitz Ex 2 (CNS 181632-633)) (**CD-ROM** Chaparral Exhibits D054).	3/17/1997
	C86	Emails Dated 1/13-3/31/97 from P. Collins to Mo re: Status Reports (Kalwitz Ex 3 (CNS 182501-511)) (**CD-ROM** Chaparral Exhibits D055).	
	C87	Hardware Schematics for the Fibre Channel Daughtercard Coronado (Kalwitz Ex 4 (CNS 181639-648)) (**CD-ROM** Chaparral Exhibits D056).	
	C88	Adaptec Schematics re AAC-340 (Kalwitz Ex 14 CNS 177215-251)) (**CD-ROM** Chaparral Exhibits D057).	
	C89	Bridge Product Line Review (Manzanares Ex 3 (CNS 177307-336)) (**CD-ROM** Chaparral Exhibits D058).	
	C90	AEC Bridge Series Products-Adaptec External Controller RAID Products Pre-Release Draft, v.6 (Manzanares Ex 4 (CNS 174632-653)). (**CD-ROM** Chaparral Exhibits D059).	10/28/1997
	C91	Hewlett-Packard Roseville Site Property Pass for Brian Smith (Dunning Ex 14 (HP 489) (**CD-ROM** Chaparral Exhibits D078).	11/7/1996
	C92	Distribution Agreement Between Hewlett-Packard and Crossroads (Dunning Ex 15 (HP 326-33) (**CD-ROM** Chaparral Exhibits D079).	
	C93	HPFC-5000 Tachyon User's Manuel, First Edition (PTI 172419-839) (**CD-ROM** Chaparral Exhibits D084).	5/1/1996
	C94	X3T10 994D - (Draft) Information Technology: SCSI-3 Architecture Model, Rev. 1.8 (PTI 165977) (**CD-ROM** Chaparral Exhibits D087).	
	C95	X3T10 Project 1047D: Information Technology- SCSI-3 Controller Commands (SCC), Rev, 6c (PTI 166400-546) (**CD-ROM** Chaparral Exhibits D088).	9/3/1996
	C96	X3T10 995D- (Draft) SCSI-3 Primary Commands, Rev. 11 (Wanamaker Ex 5 (PTI 166050-229)) (**CD-ROM** Chaparral Exhibits D089).	11/13/1996

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FMF	C97	VBAR Volume Backup and Restore (CRDS 12200-202) (**CD-ROM** Chaparral Exhibits D099).	
	C98	Preliminary Product Literature for Infinity Commstor's Fibre Channel to SCSI Protocol Bridge (Smith Ex 11; Quisenberry Ex 31 (SPLO 428-30) (**CD-ROM** Chaparral Exhibits D143).	8/19/1996
	C99	Letter dated 7/12/96 from J. Boykin to B. Smith re: Purchase Order for Evaluation Units from Crossroads (Smith Ex 24) CRDS 8556-57) (**CD-ROM** Chaparral Exhibits D144).	7/12/1996
	C100	CrossPoint 4100 Fibre Channel to SCSI Router Preliminary Datasheet (Hulsey Ex 9 (CRDS 16129-130)) (**CD-ROM** Chaparral Exhibits D145).	11/1/1996
	C101	CrossPoint 4400 Fibre Channel to SCSI Router Preliminary Datasheet (Bardach Ex. 9, Quisenberry Ex 33 (CRDS 25606-607)) (**CD-ROM** Chaparral Exhibits D153).	11/1/1996
	C102	Fax Dated 07/22/96 from L. Petti to B. Smith re: Purchase Order from Data General for FC2S Fibre to Channel SCSI Protocol Bridge Model 11 (Smith Ex 25; Quisenberry Ex 23; Bardach Ex 11 (CRDS 8552-55; 8558) (**CD-ROM** Chaparral Exhibits D155).	
	C103	Email Dated 12/20/96 from J. Boykin to B. Smith re: Purchase Order for Betas in February and March (Hoese Ex 16, Quisenberry Ex 25; Bardach Ex 12 (CRDS 13644-650) (**CD-ROM** Chaparral Exhibits D156).	
	C104	Infinity Commstor Fibre Channel Demo for Fall Comdex, 1996 (Hoese Ex 15, Bardach Ex 13 (CRDS 27415) (**CD-ROM** Chaparral Exhibits D157).	
	C105	Fax Dated 12/19/96 from B. Bardach to T. Rarich re: Purchase Order Information (Bardach Ex. 14; Smith Ex 16 (CRDS 4460)) (**CD-ROM** Chaparral Exhibits D158).	
	C106	Miscellaneous Documents Regarding Comdex (Quisenberry Ex 2 (CRDS 27415-465)) (**CD-ROM** Chaparral Exhibits D165).	
	C107	CrossPoint 4100 Fibre Channel to SCSI Router Preliminary Datasheet (Quisenberry) Ex 3 (CRDS 4933-34) (**CD-ROM** Chaparral Exhibits D166) (CD-ROM Chaparral Exhibits D166).	
	C108	CrossPoint 4400 Fibre to Channel to SCSI Router Preliminary Datasheet; Crossroads Company and Product Overview (Quisenberry Ex 4 (CRDS 25606; 16136)) (**CD-ROM** Chaparral Exhibits D167).	
	C109	Crossroads Purchase Order Log (Quisenberry Ex 9 (CRDS 14061-062)) (**CD-ROM** Chaparral Exhibits D172).	
	C110	RAID Manager 5 with RDAC 5 for UNIX V.4 User's Guide (LSI-01854) (**CD-ROM** Chaparral Exhibits P062).	9/1/1996
	C111	Letter dated May 12, 1997 from Alan G. Leal to Barbara Bardach enclosing the original OEM License and Purchase Agreement between Hewlett-Package Company and Crossroads Systems, Inc. (CRDS 02057) (**CD-ROM** Chaparral Exhibits P130).	
FMF	C112	CR4x00 Product Specification (CRDS 43929) (**CD-ROM** Chaparral Exhibits P267).	6/1/1998

FORM PTO 1449 US Department of Commerce Patent and Trademark Office	Application Number	90/007,124
	Filing Date	July 19, 2004
	First Named Inventor	Hoese, Geoffrey
	Group Art Unit	2182
	Examiner Name	Fleming, Fritz M.
Sheet 7 of 7	Atty Docket Number	CROSS1121-15

Examiner Initials	Cite No.	OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS	Date
FMF	C113	Symbios Logic – Hardware Functional Specification for the Symbios Logic Series 3 Fibre Channel Disk Array Controller Model 3701 (Engelbrecht Ex 3 (LSI-1659-1733) (**CD-ROM** Pathlight Exhibits D074).	
	C114	Report of the Working Group on Storage I/O for Large Scale Computing; Department of Computer Science Duke University: CS-1996-21 (PTI 173330-347). (**CD-ROM** Pathlight Exhibits D098).	
	C115	Brian Allison's 1999 Third Quarter Sales Plan (PDX 38)CNS 022120-132)) (**CD-ROM** Pathlight Exhibits D201).	6/5/2001
FMF	C116	Brooklyn SCSI-SCSI Intelligent External RAID Bridge Definition Phase External Documentation (**CD-ROM** Pathlight Exhibits D129).	
Examiner Signature		Fritz M Fleming — Date Considered	5/23/2005

Notice of References Cited	Application/Control No. 90/007,124	Applicant(s)/Patent Under Reexamination 6421753	
	Examiner Fritz M. Fleming	Art Unit 2182	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,345,565 A	09-1994	Jibbe et al.	710/316
	B	US-5,634,111	05-1997	Oeda et al.	711/153
	C	US-			
	D	US-			
	E	US-			
	F	US-			
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	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
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FOREIGN PATENT DOCUMENTS

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	N					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	**Application No.** 90/007,124	**Applicant(s)** 6421753
	Examiner Fritz M Fleming	**Art Unit** 2182

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
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Claim Final	Claim Original	Date [illegible] 05	Date 5 23 05	Date	Date	Date	Date	Date	Date	Date
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Search Notes	Application No.	Applicant(s)
	90/007,124	6421753
	Examiner	Art Unit
	Fritz M Fleming	2182

SEARCHED			
Class	Subclass	Date	Examiner
710	129, 1-5, 8-13, 36-38, 100-101, 105, 126-131	1/21/05	RMF
714	42		
711	100, 112, 113		
710	305-316		
updated	above	5/20/05	RMF

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)	DATE	EXMR
EAST NOTES ENCLOSED	1/21/05	RMF
NPL search: SCSI, FC, Fibre Channel, storage, block level, native, ATM		
EAST SCSI, ARRAY, DMA FIFO	5/20/05	RMF

U.S. Patent and Trademark Office

Part of Paper No. 20050124

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
CERTIFICATE OF SERVICE UNDER 37 C.F.R. 1.248	Atty. Docket No. **CROSS1121-15**

Applicant **Geoffrey B. Hoese, et al.**	
Reexamination Control No. **90/007,124**	Date Filed **07/19/2004**
Title **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **2182**	Examiner **Fleming, Fritz**

Applicant hereby serves the Reply to Office Action Under *Ex Parte* Reexamination Dated 02/07/05 in the above referenced case to:

Larry E. Severin
Wang, Hartmann & Gibbs, PC
1301 Dove Street, #1050
Newport Beach, CA 92660

As per 35 U.S.C. §1.248 service is made via first class mail on April 6, 2005.

Respectfully submitted,

Sprinkle IP Law Group

John L. Adair
Reg. No. 48,828

Dated: April 6, 2005

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Enclosures

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
REPLY TO OFFICE ACTION UNDER *EX PARTE* REEXAMINATION DATED 02/07/05	Atty. Docket No. **CROSS1121-15**

6548 U.S. PTO
04/06/05

Applicants **Geoffrey B. Hoese, et al.**	
Reexamination Control No. **90/007,124**	Date Filed **07/19/2004**
Title **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **2182**	Examiner **Fleming, Fritz**
Confirmation Number: **2295**	Patent No. **6,421,753**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate of Mailing Under 37 C.F.R. §1.10

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail No. **EV616964349US** in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22312-1450 on 4-6-05.

Julie H. Blackard
Signature

Julie A Blackard
Printed Name

Dear Sir:

In response to the Official Action mailed February 7, 2005 in the reexamination of United States Patent No. 6,421,753 (the "'753 Patent"), Applicant respectfully requests the Examiner reconsider the rejections of the Claims in view of the this reply.

IN THE CLAIMS:

1. A data storage gateway capable of interfacing with and providing connectivity and mapping between a Fiber Channel and SCSI channel interface, the data storage gateway comprising:

a virtual storage;

a storage router in communication with and providing mapping to the virtual storage such that a fiber channel device remote from the virtual storage can communicate data to and from the virtual storage; and

wherein the storage router is capable of configuring a SCSI device to contain at least a portion of the virtual storage.

2. The data storage gateway according to Claim 1, further including a memory work space for the storage router using a buffer.

3. The data storage gateway according to Claim 2 wherein a Fibre Channel transport medium connects to the storage router and interfaces with a Fibre Channel controller and wherein a SCSI bus transport medium connects to the storage router and interfaces with a SCSI controller.

4. A method for providing, through a storage router, virtual local storage on remote SCSI storage devices to Fibre Channel devices, comprising:

interfacing with a Fibre Channel transport medium;

interfacing with a SCSI bus transport medium;

maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices; and

allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration.

5. The method of Claim 4, further comprising the step of providing memory work space for the storage router using a buffer.

6. The method of Claim 5, wherein the Fibre Channel transport medium connects to and interfaces with a Fibre Channel controller and wherein said SCSI bus transport medium connects to and interfaces with a SCSI controller.

7. The method of Claim 4, wherein the maintaining step and the allowing step are performed by a supervisor unit.

8. The method of Claim 6, wherein the supervisor unit is coupled to the Fibre Channel controller, the SCSI controller, and the buffer.

TABLE OF CONTENTS FOR RESPONSE TO REJECTIONS

I. Rejections Under 35 U.S.C. §103

A. Introduction

Claims 1-8 and are variously rejected under 35 U.S.C. §103(a) as being unpatentable over Petal in view of Quam, Cummings, and Crouse.

In order to establish a *prima facie* case of obviousness, the Examiner must show: that (1) the prior art references teach or suggest all of the claim limitations, (2) that there is some suggestion or motivation in the references (or within the knowledge of one of ordinary skill in the art) to modify or combine the references and (3) that there is a reasonable expectation of success. M.P.E.P. 2142, 2143; In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). The Examiner must explain with reasonable specificity at least one rejection – otherwise, the Examiner has failed procedurally to establish a *prima facie* case of obviousness. M.P.E.P. 2142; Ex parte Blanc, 13 U.S.P.Q.2d 1383 (Bd. Pat Application. & Inter. 1989). When the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the Examiner to explain why the combination of the teachings is proper. Ex parte Skinner, 2 U.S.P.Q.2d 1788, 1790 (Bd. Pat. App. & Inter. 1986).

B. Claim 4

The Examiner rejected Claim 4 as being unpatentable over Petal in View of Quam and Cummings and devoted a significant portion of the Office Action to analyzing what Applicants believe should be Claim 4 in light of Petal. Accordingly, Applicants will first show how Claim 4 differs from the cited references and then address the other Claims.

1. Overview of Claim 4

Claim 4 recites:

> A method for providing, through a storage router, virtual local storage on remote SCSI storage devices to Fibre Channel devices, comprising:
> interfacing with a Fibre Channel transport medium;
> interfacing with a SCSI bus transport medium;
> maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices; and
> allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration. [emphasis added].

Claim 4 includes the limitations of a configuration that (i) maps between Fibre Channel devices and SCSI storage devices, (ii) and implements access controls. Additionally, Claim 4 includes the limitation of "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level block protocol in accordance with the configuration". These features of the present invention allow a Fibre Channel initiator device (e.g., workstation) to access only that portion (or portions) of the storage devices associated with that particular host. These features also allow a host (or hosts) to communicate with storage devices using only native low level block protocols ("NLLBPs").

2. Petal Does Not Disclose "Allowing Access" From a Fibre Channel Initiator Device to SCSI Storage Devices Using NLLBP

Claim 4, as discussed above, recites "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level block protocol . . ." A NLLBP is a protocol that enables workstations and network servers to exchange information with storage devices without the overhead of high-level protocols and file systems typically required by network servers. As explained below, this definition for NLLBP is supported by both the Specification of the '753 Patent, and the judicial interpretation of a similar limitation by Judge Sparks of the U.S. District Court for the Western District of Texas (an interpretation upheld on appeal by the Court of Appeals for the Federal Circuit).

In systems prior to the present invention, when a computer workstation would make a storage request to a storage device (e.g., disk drive) through a network server, the workstation first had to translate the request from its file system protocols to higher level network protocols to communicate with the network server. The network server then would translate these high level protocols into low level requests to the storage device(s). *See* '753 Patent Specification, col. 1, lines 50-60 and col. 3, lines 14-15 (distinguishing an NLLBP from higher-level protocols by contrasting the present invention to prior art solutions). This high level to low level translation wastes valuable time and makes the access of information occur at a much slower rate. *See* '753 Patent Specification, col. 1, lines 48-57.

Further, in *Crossroads v. Chaparral Network Storage, Inc.*, Western District of Texas, Civil Action No. A-00-CA-217-SS and *Crossroads Systems (Texas), Inc., v. Pathlight Technology, Inc.*, Western District of Texas, Civil Action No. A-00CA-248-JN (collectively, the "Chaparral Litigation"), the U.S. District Court for the Western District of Texas issued a Joint Markman Order (the "Markman Order") interpreting the term NLLBP for the purposes of United States Patent No. 5,941,972 (the "'972 Patent") as follows:

> a set of rules or standards that enable computers to exchange information and do not involve the overhead of high level protocols and file systems typically required by network servers.

A copy of the Markman Order is attached hereto as Exhibit A. This construction, and the validity of the '972 Patent, was upheld by the Federal Circuit on appeal. A copy of the Federal Circuit decision affirming the decision of the lower court is attached hereto as Exhibit B. Thus, based on the Markman Order, an NLLBP is a protocol that enables computers to exchange information without the overhead of high-level protocols and file systems typically required by network servers.

As discussed in the '753 Patent, allowing access from host devices (e.g., workstations) to storage devices is done using NLLBPs in the present invention. Using the example of a first of Fibre Channel ("FC") and second transport medium of Small Computer System Interface ("SCSI"), a FC-connected workstation can communicate low level SCSI commands directly to a storage device using NLLBPs. For this example, the present invention accomplishes this by encapsulating the low level SCSI commands in an FC 'wrapper' or 'layer.' The specification of the '753 Patent discusses such an exemplary embodiment where a Fibre Channel-attached initiator (e.g., workstation) issues SCSI-3 FCP commands, and an associated SCSI-target storage device operates on a SCSI-2 protocol (See, '753 Patent, col. 6, lines 33-45). In this case, a storage router connected between the host device and the storage device receives the FC-encapsulated low level SCSI commands, removes the FC encapsulation, and forwards the low level SCSI commands to the storage devices (provided the workstation is allowed to have such access, as will be discussed more fully below). In this example, there is no translation of the commands from a higher level protocol to a low level protocol. In other words, the storage router is not required to translate some high level command from the workstation (e.g., a file system command, or function call with arguments) into a low level SCSI command. Rather, the storage router simply strips the FC 'layer' off of the existing SCSI command, and forwards the SCSI command to the storage device without any high-to-low level translation (because no such high level to low level translation is needed). Thus, when a host workstation is allowed to have access to a storage device, that access is accomplished using only NLLBPs.

Petal, on the other hand, discloses a system in which Petal clients (i.e., workstations) send higher-level protocol commands to the Petal Server that, in turn, transforms these higher–level, higher overhead commands into low-level SCSI commands that are forwarded to the storage devices (i.e., at least one high level to low level translation takes place between the workstation and the storage device). Petal clients are configured with a Petal device driver in the kernel layer of the Petal client. *See*, *Petal* page 88, col. 2, section 3. Higher level applications (i.e., user space applications) see virtual disks (representations of the storage devices) through the Unix File System. *See* Petal, page 90, col. 1, section 3.2. When a Petal client wishes to access a storage device behind the Petal server, the client issues a file system command to the virtual disk which is passed through the class layer to the Petal device driver (i.e., the kernel layer process for accessing the virtual disk). The Petal device driver then issues a remote procedure call ("RPC") using the User Datagram Protocol ("UDP") to the Petal server to read or write data. *See, Id* at page 88, col. 2, section 3 (describing the RPC interface) and page 89, col. 1, section 3.1 (describing handling read and write requests). The Petal device driver acts as a filter driver to translate the command to the virtual disk seen by the user space application into an RPC that is sent out in UDP packets.

An RPC is a well known mechanism in networked operating systems and is essentially a function call to the Petal Server. In issuing an RPC, a client will provide a server with the appropriate arguments in a UDP packet so that the server can perform some process. The Petal Server performs a transformation when receiving the RPC in the UDP packet by processing the RPC in the UDP packet to execute the called process and generate the appropriate low level SCSI READ and WRITE commands. Thus, the Petal client uses the traditional network mechanism of issuing a higher level command (e.g., an RPC in a UDP packet) to the network server that the network server processes to call a function. The Petal server must execute the appropriate function to transform the information in the UDP packets to the appropriate low level SCSI command.

Thus, the Petal system <u>does not</u> allow the client (i.e., workstation) to access the storage devices using an NLLBP. Instead, the Petal client uses a scheme in which high level file system commands to virtual disks are translated into RPCs which are packaged in UDP packets and transported to the Petal server for transformation into low level commands. Unlike the NLLBP commands described and claimed in the '753 Patent, these RPC in UDP packets contain additional higher level overhead and require transformation to low level SCSI commands at the Petal Server. As noted above, the Petal server executes the called procedure to transform the RPC in UDP to the appropriate low level SCSI command.

The process of Petal therefore requires first creating an RPC, and then encapsulating the RPC in UDP at the Petal client, and further executing a procedure to transform the RPC in UDP to a low level SCSI command. Consequently, while the Examiner has pointed out various portions of Petal that discuss using block-level (i.e., low level) storage protocols (e.g., SCSI commands), it is only in the context of the time period after high level RPCs have been transformed to low level SCSI commands. The system of Petal is the type of system that the present invention was designed to overcome, because the system of Petal **does** involve the overhead of high level protocols typically required by network servers(i.e., RPCs), and requires a transformation of the high level protocols into low level SCSI commands at the Petal server.

Therefore, Petal does not disclose, teach or suggest a system for "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level block protocol," as recited in independent Claim 4.

3. Petal Does Not Disclose Mapping Between Fibre Channel Devices and SCSI Storage Devices

Claim 4 also recites a configuration that "maps between Fibre Channel devices and the SCSI storage devices." Mapping between Fibre Channel device and SCSI storage devices in the present invention refers to a mapping between the Fibre Channel devices and SCSI storage devices such that a particular Fibre Channel device on the Fibre Channel transport medium is associated with a storage device, storage devices, or portions thereof, on the SCSI bus transport medium. As discussed in the '753 Patent Specification, the mapping provides a correlation between devices on the first data transport medium (e.g., workstations) and the storage devices. *See*, '753 Patent col. 1, lines 6 through col. 2, line 5 and col. 8, lines 67 – col. 9, line 5.

In the Chaparral Litigation, the U.S. District Court for the Western District of Texas adopted the definition that a "map" contains a representation of a device on one side of the storage router to a storage device on the other side (e.g., from a Fibre Channel host device to a SCSI storage device). *See*, Markman Order, Exhibit A, page 12. The mapping of the '753 Patent associates the Fibre Channel devices (e.g., workstations) with SCSI storage devices on the SCSI bus transport medium. Thus, the mapping can include mapping from a host workstation identifier (e.g., address or other identifier) to a virtual representation of a storage device (e.g., a virtual Logical Unit Number (LUN)), and potentially even further from the virtual representation of the storage device to a physical representation of the storage device (e.g., a physical LUN).

It should be expressly understood that the 'mapping' of the present invention is not identical to the concept of "virtualization." In virtualization, a storage device (or portion thereof) is presented with a particular logical address to the hosts or workstations. While it is clear that the present invention can include virtualization as part of the mapping (e.g., the map can include the mapping from a virtual representation of the storage (virtual LUN) to a physical representation of the storage (physical LUN)), such virtualization is not, in and of itself, a mapping between devices as defined in the '753 Patent. *See*, '753 Patent, col. 8, line 65-67. In fact, this type of virtualization was available in a number of RAID systems at the time Petal was written. Virtualization does not require that representations of workstations on one side of the storage router be mapped to a storage device(s) on the other side of the storage router.

Petal does not disclose, teach or suggest a map that maps between Fibre Channel devices and SCSI storage devices connected to the SCSI bus transport medium as recited in Claim 4 of the '753 Patent. In Petal there is simply no map that associates host devices (i.e., the Petal clients) with the storage devices or representations of the storage devices. At best, Petal teaches "virtualization" of storage devices. In other words, Petal discusses a virtual to physical mapping of the storage devices rather than a mapping from the device making a request (e.g., workstation) to the storage device for which the request is intended. Petal states:

> The basic problem is to translate virtual addresses of the form <virtual-disk-identifier, offset> to physical addresses of the form <server-identifier, disk-identifier, disk-offset>.

See Petal, page 85-86, sections 2.1-2.3 and Figure 4 (entitled "Virtual to Physical Mapping").

In Petal, a virtual disk directory of virtual disks is mapped to a global directory which is mapped to physical disks. *Id.* A client workstation provides a virtual disk identity which is translated into a global map identifier. *Id.* The global map determines the server responsible for translating the given offset. *Id.* The physical map of the specified server translates the global map identifier and offset to a physical disk and an offset within that disk. *See Id.*, page 86, col. 1, section 2.1. Thus, the mapping of Petal only represents the virtualization mapping of storage devices and does not correlate or associate the storage devices (either virtual or physical) to particular Petal clients (e.g., workstations) on the other side of the Petal server. In fact, the virtualization-type mapping described in Petal is simply a description of the virtualization technique generally used in RAID systems at the time of Petal.

The Examiner correctly points out that, in Petal, a disk identifier used by clients to reference a particular virtual disk is "mapped" to a physical identifier. However, this is simply virtualization-type mapping. There is no correspondence (or map) made from the Petal clients to the storage devices (or portions thereof) behind the Petal Server. Put another way, there is no mechanism disclosed in Petal to perform the function of mapping a particular client workstation to a particular storage device (or portion). Consequently, Petal teaches a virtualization scheme, <u>not</u> a configuration that "maps between Fibre Channel devices and SCSI storage devices" as recited in Claim 4 of the '753 Patent.

4. Petal Does Not Disclose Implementing "Access Controls"

a. Implementing Access Controls Requires Allowing Access Using NLLBPs

Claim 4 recites "implementing access controls" which requires allowing access using NLLBPs. As described in the '753 Patent, "access controls" are a particular form of security measure designed to prevent unauthorized access to particular storage devices or portions of storage devices by certain workstations. When "access controls" are implemented, particular Fibre Channel devices may be permitted access to particular storage devices or subsets of storage devices. *See, e.g.,* FIGURE 3 of the '753 Patent (permitting access from particular workstations to undivided storage devices as well as divided subsections within a single storage device). According to the previously mentioned Markman Order, "access controls" means "providing controls which limit a computer's access to specific subset of storage devices or sections of a single storage device." *See,* Markman Order, Exhibit A, page 6.

The "access controls" of the '753 Patent allow access using a NLLBP such that requests from devices connected to the first transport medium (e.g., workstations) are directed to assigned virtual local storage on the storage devices. *See*, '753 Patent, col. 8, lines 61-65. The '753 Patent recites:

> The storage router can...map, for each initiator, what storage access is available and what partition is being addressed by a particular request. In this manner, the storage space provided by [storage devices] can be allocated to [devices connected to the first transport medium] to provide virtual local storage...

See '753 Patent, col. 8, lines 67 – col. 9, line 5.

Thus, the "access controls" described in the '753 Patent are device-centric in that they permit or deny access from particular devices connected to the first data transport medium (e.g., workstations) to particular storage devices (or subsets thereof) according to the configuration. The access controls are thus part of the configuration for routing commands from a device connected to the first transport medium to *defined* storage location(s) using NLLBPs (i.e., without requiring the overhead of high level protocols typically required by network servers) according to the map.

b. Petal Does Not Render The Access Controls Limitation Of Claim 4 Obvious

In rejecting the limitation of "implementing access controls" the Examiner points to Petal, page 90, col. 2, section 4, which states in pertinent part:

> ...currently we do not provide any special support for protecting a client's data from other clients; however, it would not be difficult to provide security on a per virtual disk basis.

Applicants submit, however, that the statement "it would not be difficult to provide security on a per virtual disk basis," without more, does not enable security on per virtual disk basis in the UDP environment of Petal. UDP is primarily a broadcast protocol in which the computer issuing a UDP communication typically places UDP packets on a network without regard to the device that receives the packets.

Petal provides no support as to how to implement its "security on a per virtual disk basis" for UDP broadcast packets communicated over an ATM transport medium. For example, a common security method in packet based networks is the use of access control lists ("ACLs"). While ACLs may be used to entirely block UDP communications (e.g., as in a firewall), Petal provides no suggestions on how to implement ACLs in a UDP environment to limit access to a portion of a server file system (e.g., a particular virtual disk). As Petal provides no support for providing security in the UDP/ATM environment, Applicants respectfully submit that Petal, at best, only makes it 'obvious to try' some unspecified form of security.

"An 'obvious-to-try' situation exists when a general disclosure may pique the scientist's curiosity, such that further investigation might be done as the result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain direction were followed." *In re Eli Lilly & Company*, 902 F.2d 943, 945, 14 USPQ.2d 1741 (Fed Cir. 1990). "Obvious-to-try", however, is not the standard for obviousness under §103. *See, In Re O'Farrell*, 853 F.2d 894, 902, 7 USPQ.2d 1673 (Fed. Cir. 1988). For example, the statement in a patent that "the user of the external field canceling method . . .. can allow for gradient fields to be produced with greatly reduced problems" provided only general guidance as to the form of the claimed invention and how to achieve it but did not provide sufficient guidance to render the claimed invention obvious. *See, In Re Roemer*, 258 F.3d, 1303, 1309-10, 59 USPQ.2d 1527 (Fed. Cir. 2001). Similarly, the Petal reference does not provide sufficient guidance as to what is meant by "security" or how to implement such a "security" feature; and certainly does not provide any guidance on how to implement "access controls" as recited in Claim 4 of the '753 Patent.

At best, the statement in Petal that "currently we do not provide any special support for protecting a client's data from other clients; however, it would not be difficult to provide security on a per virtual disk basis" is an invitation-to-try to implement some unspecified security feature on a per virtual disk basis. The statement does not provide any teaching or suggestion as to how the security feature would be achieved, much less how "access controls" that allow access using NLLBPs would be achieved. Thus, while it may be 'obvious-to-try' some unspecified security feature based on the above-cited statement, one is left completely in the dark as to how such security would be achieved.

Moreover, the Examiner has not pointed to any art or other evidence in the record such that one of ordinary skill in the art would have a reasonable expectation of success in implementing the claimed "access controls" to allow access using an NLLBP in a UDP/ATM environment to limit access to a particular virtual disk. If the Examiner is relying on his own knowledge that one of skill in the art would know how to implement "access controls" that allow access using an NLLBP on a per virtual disk basis in the Petal environment, then Applicants respectfully request that the Examiner provide an affidavit detailing the data on which the Examiner relies for this position, or alternatively allow Claim 4. See 37 CFR 1.107(b) and MPEP 707.05.

c. There Is No Disclosure or Teaching In Petal That The 'Security' Referenced Therein Would Allow Access Using NLLBP

Even though the Petal article states that "it would not be difficult to provide security on a per virtual disk basis" there is no teaching or suggestion as to how such security would be provided. Certainly, there is no teaching or suggestion in Petal that a 'security' feature could be implemented to allow access using an NLLBP. It simply is unclear what type or manner of 'security' Petal references. For example, security can be a simple password-based security scheme, or something much more complex.

Moreover, even if security were implemented in Petal, there is no teaching or suggestion that such security would be implemented to allow access using a NLLBP. It would appear that any security implemented would be on top of the high level RPC over UDP scheme of Petal. Again, this would appear to require the high-level protocols and would not provide access using an NLLBP. Thus, even if security were applied to the system of Petal, this does not suggest access controls that allow access using an NLLBP.

5. Quam and Cummings

The Examiner relies on Quam and Cummings for the proposition that "it would have been obvious to change from ATM to Fibre Channel in the system of Petal. Regardless of this, neither Quam nor Cummings makes up for the deficiencies of Petal and the Examiner has not pointed out where Quam or Cummings teach or suggest (i) mapping between devices connected to a Fibre Channel transport medium and SCSI storage devices, (ii) "implementing access controls" and (iii) "allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level block protocol". Even if Quam and Cummings are combined with Petal, the combination would lack these features of Claim 4. Accordingly, Applicants respectfully request allowance of Claim 4.

6. Summary

In sum, the cited references fail to teach: (1)"allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level block protocols," (2) maintaining a configuration that "maps between Fibre Channel devices and SCSI storage devices" and (3) maintaining a configuration that "implements access controls."

Instead, Petal teaches a system in which high level RPC calls in UDP packets must be transformed into low-level SCSI commands by the Petal server. Further, there is no disclosure, teaching or suggestion in Petal that clients on one side of the Petal server should be mapped to storage devices on the other side of the Petal server. Moreover, access controls that allow access using NLLBPs are not disclosed, taught or suggested in Petal nor is any other security method. At most, Petal suggests that it would be 'obvious-to-try' adding an undefined security measure, without providing any direction as to how to do so with a reasonable expectation of success. Moreover, the Examiner has not pointed out where these features can be found in Quam and Cummings. Therefore, Applicants submit that Petal, Quam and Cummings (alone or in combination) do not render obvious the present invention as recited in Claim 4, and respectfully requests allowance of such claim. Applicants also respectfully request allowance of Claims 4-8.

C. Claim 1

1. Overview of Claim 1
Claim 1 recites:

> A data storage gateway capable of interfacing with and providing connectivity and mapping between a Fiber Channel and SCSI channel interface, the data storage gateway comprising:
> a virtual storage;
> a storage router in communication with and providing mapping to the virtual storage such that a fiber channel device remote from the virtual storage can communicate data to and from the virtual storage; and
> wherein the storage router is capable of configuring a SCSI device to contain at least a portion of the virtual storage.

Claim 1 includes the limitation that the storage router provides a "mapping to the virtual storage such that a fibre channel device . . . can communicate data to and from the virtual storage." The mapping thus maps a fibre channel device to the virtual storage with which it can communicate data.

2. Petal Does Not Disclose a "Map" to the Virtual Storage

The storage router of Claim 1 maps from a Fibre Channel device to the virtual storage to allow the Fibre Channel device to communicate with the virtual storage. This mapping is more than mere virtualization as the storage router associates the Fibre Channel device with the virtual storage to allow the Fibre Channel to communicate data to and from the virtual storage.

Petal does not disclose, teach or suggest a map that associates particular devices connected to the first transport medium with virtual storage (i.e., particular storage devices or subsets thereof). Rather, Petal teaches that a virtual to physical mapping (i.e., virtualization of the storage device) takes place. There is, however, no correspondence made between the clients and storage devices (or portions thereof) in the mapping of Petal; i.e., there is no mechanism disclosed to say "this client maps to that virtual storage" on the other side of the Petal server. Consequently, Petal teaches a virtualization scheme <u>not</u> a "mapping" to the virtual storage to allow a Fibre Channel device to communicate data to and from the virtual storage.

3. Additional Cited References

Applicants respectfully submit that the Examiner has not pointed out where Quam, Cummings or Crouse make up for this deficiency in Petal. Therefore, Applicants respectfully submit that the Examiner has not made out a *prima facie* case of obviousness with respect to

Claim 1. Applicants therefore respectfully request allowance of Claim 1. Additionally, Applicants request allowance of Claims 2-3 as representing further limitations on Claim 1.

D. Summary: There is No *Prima Facie* Showing of Obviousness

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness for Claims 4-8 as the prior art references do not disclose, teach or suggest all of the claim limitations. Specifically, the prior art cited by the Examiner does not appear to teach or suggest i) maintaining a configuration that maps between Fibre Channel devices and SCSI storage devices," ii) maintaining a configuration that "implements access controls for the storage space on the SCSI storage devices" and iii) "allowing access from Fibre Channel initiator devices to SCSI storage devices using a NLLBP." Additionally, with respect to Claim 1, the prior art does not appear to teach or suggest "mapping to the virtual storage such that a fibre channel device . . . can communicate data to and from the virtual storage." While the Examiner has provided a detailed discussion of Petal to attempt to show where these features are found, Applicants respectfully submit that Petal does not disclose, teach or suggest the claimed limitations. Furthermore, the remaining cited references (Quam, Cummings and Crouse) alone or in combination, do not make up for the deficiencies in Petal. Accordingly, Applicants respectfully request allowance of Claims 1-8.

II. Conclusion

Applicants appreciate the Examiner's diligence in issuing thorough office actions in multiple reexamination cases so quickly. Applicants respectfully submit, however, that Claims 1-8 are distinguishable from the Petal, Quam, Cummings and Crouse references. Therefore, Applicants respectfully request allowance of all claims subject to reexamination.

Applicant has now made an earnest attempt to place this case in condition for allowance. Other than as explicitly set forth above, this reply does not include an acquiescence to statements, assertions, assumptions, conclusions, or any combination thereof in the Office Action.

This Reply was served via First Class Mail on April 6, 2005 to Larry E. Severin, Wang, Hartmann & Gibbs, PC, 1301 Dove Street #1050, Newport Beach, CA 92660.

The Director of the U.S. Patent and Trademark Office is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-3183 of Sprinkle IP Law Group.

Respectfully submitted,

Sprinkle IP Law Group
Attorneys for Applicant

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CLERK, U.S. DISTRICT COURT
WESTERN DISTRICT OF TEXAS
BY ________ DEPUTY CLERK

NOTE: Pursuant to Fed. Cir. R. 47.6, this disposition is not citable as precedent. It is a public record. This disposition will appear in tables published periodically.

United States Court of Appeals for the Federal Circuit

FILED

MAR 1 0 2003

CLERK, U.S. DISTRICT COURT
WESTERN DISTRICT OF TEXAS
BY ________ DEPUTY CLERK

02-1158

CROSSROADS SYSTEMS, (TEXAS), INC.,

Plaintiff-Appellee,

v.

CHAPARRAL NETWORK STORAGE, INC.,

Defendant-Appellant.

FILED
U.S. COURT OF APPEALS FOR THE FEDERAL CIRCUIT

FEB 1 2 2003

JAN HORBALY
CLERK

JUDGMENT

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I HEREBY CERTIFY THIS DOCUMENT IS A TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE.
UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT
By: A. Tomlinson Date: 3/5/03

ON APPEAL from the United States District Court for the Western District of Texas

In CASE NO(S). 00-CV-217 and 00-CV-621

This CAUSE having been heard and considered, it is

ORDERED and ADJUDGED: AFFIRMED. See Fed. Cir. R. 36

Per Curiam (NEWMAN, SCHALL, and DYK, Circuit Judges).

ENTERED BY ORDER OF THE COURT

DATED: FEB 1 2 2003

Jan Horbaly, Clerk

ISSUED AS A MANDATE: MARCH 5, 2003

Costs Against Appellant:
Total $97.35

186

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

FILED
JUL 27 2000
U.S. DISTRICT COURT
CLERK'S OFFICE
BY DEPUTY

CROSSROADS SYSTEMS, (TEXAS), INC.	§	
	§	
vs.	§	NO. A 00 CA 217 SS
	§	
CHAPARRAL NETWORK STORAGE, INC.	§	

CROSSROADS SYSTEMS, (TEXAS), INC.	§	
	§	
vs.	§	NO. A 00 CA 248 SS
	§	
PATHLIGHT TECHNOLOGY, INC.	§	

ORDER

BE IT REMEMBERED that on the 25th day of July 2000 the Court, in accordance with *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995), *aff'd*, 116 S. Ct. 1384 (1996), held a hearing at which the parties appeared by representation of counsel and made oral arguments on their proposed claims construction. At the hearing, the parties presented a Joint Stipulation of Claim Construction, indicating that the parties have agreed upon the definitions for seventeen terms and/or phrases in U.S. Patent No. 5,941,972 ("the '972 patent"), and that only ten terms and/or phrases in the '972 patent remain in dispute. After considering the briefs, the case file as a whole, and the applicable law, the Court enters the following opinion and order.

I. Standard for Claims Construction

The construction of claims, or the definition of the terms used in the claims, is a matter of law for the Court. When adopting a claim construction, the Court should first consider the intrinsic evidence, which includes the claims, the specification, and the prosecution history. *See Vitronics*

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Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996) (explaining that intrinsic evidence is "the most significant source of the legally operative meaning of disputed claim language"). Not surprisingly, the starting point is always "the words of the claims themselves." *Id.; see also Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998). The words of the claims are generally given their ordinary and customary meaning, unless the patentee intended to use a "special definition of the term clearly stated in the patent specification or file history." *Vitronics*, 90 F.3d at 1582. Thus, the Court must review the specification and file history to determine whether the patentee intended to use any such "special" definitions. *See id.* The specification and file history may also be consulted as general guides for claim interpretation. *See Comark*, 156 F.3d at 1186.

The specification and file history, however, are not substitutes for the plain language of the claims. The specification is not meant to describe the full scope of the patent – it includes only a written description of the invention, sufficient to enable a person skilled in the art to make and use it, as well as the invention's "best mode." *See* 35 U.S.C. § 112. Thus, the claims may be broader than the specification, and generally should not be confined to the examples of the invention set forth in the specification. *See Comark*, 156 F.3d at 1187 ("Although the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims."). Indeed, the Federal Circuit has repeatedly emphasized that "limitations from the specification are not to be read into the claims." *Id.* at 1186.

In addition to examining the intrinsic evidence the Court may, in its discretion, receive extrinsic evidence regarding the proper construction of the patent's terms. *See Key Pharmaceuticals* *v. Hercon Labs. Corp.*, 161 F.3d 709, 716 (Fed. Cir. 1998) ("[T]rial courts generally can hear expert testimony for background and education on the technology implicated by the presented claim construction issues, and trial courts have broad discretion in this regard."). The plaintiff has provided an expert affidavit and the defendant has provided excerpts from several dictionaries as extrinsic evidence concerning the construction of the terms of the '972 patent.

II. "implements access controls for storage space on the SCSI storage devices"

This phrase is used in claims 1, 10 and 11 of the '972 patent. The parties dispute whether the phrase refers to "access controls" only for certain subsections of a divided SCSI storage device, or whether it also includes limiting access to entire undivided SCSI storage devices. The plaintiff argues the phrase includes both kinds of access controls; the defendants say the phrase refers only to access controls for various subsections within a single divided SCSI storage device. The defendants also argue the plaintiff's construction is improper because, if adopted, it will result in the '972 patent being invalidated by prior art.

The plaintiff proposes the following definition: "provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device." *See* Plaintiff's Brief, at 20. The defendants propose the phrase should be defined as "partitions the storage space on each one of the SCSI storage devices and defines the accessibility of each resulting partition." *See* Defendants' Brief, Ex. 2. The Court agrees with the plaintiff.

The intrinsic evidence of the '972 patent shows the plaintiff's invention is intended to restrict access both to subsections of a SCSI storage device, as well as to entire, undivided SCSI devices. First, the plain language of this phrase refers only to "storage space" and does not limit the space only to subsections of a divided SCSI storage device. Second, Figure 3 of the '972 patent supports a broad reading of this phrase. Figure 3 shows three SCSI storage devices, two of which are undivided (60 and 64). The third device (62) is divided into four subsections of storage space. From the simple labeling on Figure 3, it is clear that the entire, undivided storage device (64) is meant to be accessed only by a single workstation (computer E). Thus, Figure 3 expressly shows that the plaintiff's invention contemplates using "access controls" for an entire, undivided storage device as well as for the divided subsections within a single storage device.[1] Third, the language of the specification expressly describes limiting access to an entire, undivided SCSI storage device. Specifically, in referring to Figure 3, the specification states "storage device 64 can be allocated as storage for the remaining workstation 58 (workstation E)." *See* '972 Patent, at 4:20 - 4:21. At the hearing, the defendants' counsel argued that, simply because Figure 3 describes this feature does not mean the feature was intended to be part of the claimed invention. The Court soundly rejects this argument. Figure 3 is meant to be an example of how the plaintiff's claimed invention can be implemented, and the specification clearly describes this figure as illustrating one implementation of the claimed invention. Adopting the defendants' argument would ignore a fundamental principle of claims construction, oft repeated in the defendants' brief and oral arguments, that the specification is "the single best guide to the meaning of a disputed term." *See Vitronics*, 90 F.3d at 1582. Finally, the defendants correctly point out that the specification also refers to the single, undivided storage device (64) as a "partition (i.e., logical storage definition)." *See* '972 Patent, at 4:44 - 4:47. Rather than compel the defendants' proposed construction, however, this language supports the plaintiff's

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[1] Figure 3 also discloses – and the defendants do not dispute – that the plaintiff's invention contemplates limiting access to various subsections of the divided SCSI storage device (62).

argument at the hearing that a discrete unit of storage – whether an entire SCSI storage device or a subsection within that device – can be referred to as a "partition."[2]

The defendants also argue that, even if the intrinsic evidence supports the plaintiff's proposed definition, this definition is nonetheless improper because it would cause the '972 patent to read directly upon prior art (and therefore be invalid). It is true that "claims should be read in a way that avoids ensnaring prior art if it is possible to do so." *Harris Corp. v. IXYS Corp.*, 114 F.3d 1149, 1153 (Fed. Cir. 1997). However, the defendants have not shown that the prior art at issue – the Lui patent – would be "ensnared" by adopting the plaintiff's definition. Importantly, the Lui patent was part of the prior art expressly considered by the patent examiner before granting the '972 patent. The patent examiner apparently did not use the Lui patent to reject a single claim in the '972 patent. The patent examiner also did not issue an Office Action requiring the plaintiff to distinguish its invention from the Lui patent on access control (or any other) grounds. Although the Patent Office is not the model of efficiency or thoroughness, its failure to cite the Lui patent as potentially invalidating prior art creates a strong presumption that the Lui patent does not read upon the plaintiff's claimed invention. In addition, it does not appear to the Court that the Lui patent reads upon the '972 claimed invention. While the Lui patent does disclose a system of Fibre Channel computers and SCSI storage devices, *see* Defendants' Brief, Ex. 6, at 2:53 - 2:65, the similarities end there. The Lui patent concerns an invention of "bypass circuits" used to "prevent the failure of any device" in the system. *See id.*, at Abstract. The invention of the Lui patent is not concerned with the swift transfer of information across a router, and thus does not disclose techniques for mapping,

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[2] The Court expressly notes, however, that it is not defining the term "partition" in this order, as that term is not used in the '972 claim language.

implementing access controls, or a memory buffer.[3] At the hearing, the defendants' counsel suggested that Figure 2 of the Lui patent discloses the claimed invention of the '972 patent. However, Figure 2 of the Lui patent is not a part of the Lui invention; rather it is an illustration of a "conventional" network system that the Lui invention allegedly improves upon. *See id.* at 3:66. The Court rejects the defendants' argument that "conventional" network systems also read directly upon the '972 claimed invention. The patent examiner may have let one piece of prior art slip by; he or she would not have missed a "conventional" network system directly applicable to the plaintiff's claimed invention.

In sum, the Court will adopt the plaintiff's proposed definition and construe the phrase "implements access controls" in the claims of the '972 patent to mean "provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device."

III. "allocation of subsets of storage space to associated Fibre Channel devices, wherein each subset is only accessible by the associated Fibre Chanel device"

The dispute here is essentially the same as in the preceding section. This phrase is used in claims 2, 8 and 12 of the '972 patent. As it did with the "implements access controls . . ." phrase, the plaintiff argues the "allocation . . ." phrase means that specific Fibre Channel devices can be allocated storage space on subsections of a single SCSI storage device and on entire, undivided SCSI storage devices. The defendants stick to their general argument on this issue, and contend the phrase

[3] The defendants argue these features are "implicitly" found in the Lui specification and in any event were disclosed in other prior art. *See* Defendants' Brief, at 12 and n.1. The Court is not persuaded that these features are "implicitly" disclosed by the Lui patent, and the other prior art briefly referenced by the defendants makes no mention of combining that prior art with the invention of the Lui patent, or vice-versa.

means storage space can only be allocated on subsections of a single divided SCSI storage device. Both parties agree this storage space, however it is defined, can only be accessed by the specified Fibre Channel device(s).

The plaintiff's proposed definition is "subsets of storage space are allocated to specific Fibre Channel devices." *See* Plaintiff's Brief, at 26. The defendants say the phrase should be defined to mean "one or more partitions that are only accessible by a single Fibre Channel device." *See* Defendants' Brief, Ex. 2. For the reasons discussed in the preceding section, the Court adopts the plaintiff's proposed construction.

IV. "supervisor unit"

This term is used in claims 1, 2 and 10 of the '972 patent. The plaintiff contends this term should be defined as "a microprocessor programmed to process data in a buffer in order to map between Fibre Channel devices and SCSI devices and which implements access controls." *See* Plaintiff's Brief, at 25. The defendants argue the term should be defined as "an Intel 80960RP processor" with several specific features. *See* Defendants' Brief, Ex. 2.

The defendants argue their construction is mandated by the means-plus-function analysis of § 112(6) of the Patent Act, because the claims of the '972 patent do not adequately describe the "supervisor unit" to be used. *See* Defendants' Brief, at 15-17. The plaintiff argues that § 112(6) does not apply because the term "means" is not used with the term "supervisor unit" and because the term "supervisor unit" is adequately described by other claim language in the '972 patent. *See* Plaintiff's *Markman* Exhibits, at 35-39.

Section 112(6) of the Patent Act provides that when a claim refers to the "means for" a specific act, but fails to adequately describe these means, the means then must be defined by reference to the specification. *See* 35 U.S.C. § 112(6).[4] If the claim language at issue does not include the term "means," there is a presumption that the § 112(6) means-plus-function analysis does not apply. *See Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1318 (Fed. Cir. 1999) ("[W]hen an element of a claim does not use the term 'means,' treatment as a means-plus-function claim element is generally not appropriate."). To overcome this presumption, the party seeking to apply § 112(6) must show the claim language at issue is purely functional and that other claim language does not adequately describe the disputed term. *See id.* ("[W]hen it is apparent that the element invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means-plus-function element despite the lack of express means-plus- function language."). From a review of the claim language as a whole, the Court agrees with the plaintiff that the term "supervisor unit" is not purely functional, but refers instead to a device that can perform the tasks specifically listed in the claim language of the '972 patent. Specifically, claims 1, 2 and 10 of the '972 patent describe a "supervisor unit" that can: (1) maintain and map the configuration of networked Fibre Channel and SCSI storage devices; (2) include in this configuration an allocation of specific storage space to specific Fibre Channel devices; (3) implement access controls for the SCSI storage devices; and (4) process data in the storage router's buffer to allow an exchange between the Fibre Channel and SCSI storage devices. *See* '972 Patent,

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[4] Section 112(6) reads as follows: "An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112(6).

at Claims 1, 2 and 10. These are the same tasks described in the plaintiff's propposed definition. In addition, the specification expressly defines the "supervisor unit" as "a microprocessor" (a computer chip) and specifically as "a microprocessor for controlling operation of storage router 56 and to handle mapping and security access for requests between Fibre Channel 52 and SCSI bus 54." *See id.* at 5:7 - 5:10. However, neither the specification (nor the claim language) limits the '972 patent to the specific Intel computer chip referenced by the defendants. Although the defendants correctly point out that the Intel 80960 chip is the only computer chip expressly named in the '972 patent and the specification describes many features this chip, the defendants fail to note that the Intel 80960 chip is listed as only "one implementation" of the claimed invention's microprocessor. *See* '972 Patent, at 5:63. The defendants are attempting exactly what the Federal Circuit prohibits – to limit the claims to the preferred embodiment and examples of the specification. "This court has cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification." *Comark*, 156 F.3d at 1186 (quoting *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1563 (Fed. Cir. 1988)). The Court will not use an example of "one implementation" in the specification to limit the plain language of the claims. Accordingly, the Court adopts the plaintiff's definition of "supervisor unit" and will construe that term as used in the claims of the '972 patent to mean "a microprocessor programmed to process data in a buffer in order to map between Fibre Channel devices and SCSI devices and which implements access controls."

V. "SCSI storage devices"

This term is used in claims 1, 4, 7, 9-11 and 14 of the '972 patent. The plaintiff argues that this term essentially needs no further definition because the term SCSI is so well-known in the industry, but proposes that the term can be further defined as "any storage device including, for example, a tape drive, CD-ROM drive, or a hard disk drive that understands the SCSI protocol and can communicate using the SCSI protocol." *See* Plaintiff's Brief, at 18. The defendants argue the term should be defined as "any storage device that uses a SCSI standard and has a unique BUS:TARGET:LUN address." *See* Defendants' Brief, Ex. 2.

The Court agrees with the plaintiff. Essentially, the defendants contend their narrow definition should be used because it "comports with '972 specification" and its discussion of SCSI storage devices. *See* Defendant's Brief, at 14. However, the specification language referred to by the defendants is only one example of how the SCSI storage device addressing scheme "can" be represented. *See* '972 Patent, at 7:39. Again, the defendants are impermissibly trying to limit the claim language to an example given in the specification. *See Comark*, 156 F.3d at 1186-87. For the sake of extra clarity, the Court will adopt the plaintiff's proposed definition for this term.

VI. "process data in the buffer"

This phrase is used in claims 1 and 10 of the '972 patent. The plaintiff argues the phrase is adequately defined on its own and by the surrounding claim language. The defendants contend the phrase should be defined as "to manipulate data in the buffer in a manner to (a) achieve mapping between Fibre Channel and SCSI devices, and (b) apply access controls and routing functions." *See* Defendants' Brief, Ex. 2.

The plain language of claims 1 and 10 disclose that the supervisor unit (the microprocessor) processes data in the buffer "to interface between the Fibre Channel controller and the SCSI controller to allow access from Fibre Channel initiator devices to SCSI storage devices using the native low level, block protocol in accordance with the configuration." *See* '972 Patent, at Claims 1 and 10. This language adequately describes what it means to "process data in the buffer" for these claims. Simply because the specification may use slightly different language to describe this "processing," *see id.* at 5:18 - 5:20, does not entitle the defendants to adopt the specification language over the plain language of the claims. The Court will not further define this phrase.

VII. "storage router"

This term is used in claims 1-7 and 10 of the '972 patent. The plaintiff argues the term needs no further definition for claims 1-6, and for claim 7 it should be defined as "a device which provides virtual local storage, maps, implements access controls, and allows access using native low level block protocols." *See* Plaintiff's Brief, at 27. The defendants contend the term should mean "a bridge device that connects a Fibre Channel link directly to a SCSI bus and enables the exchange of SCSI command set information between application clients on SCSI bus devices and the Fibre Channel links." *See* Defendants' Brief, Ex. 2.

The defendants do not make any argument for their proposed definition in their brief, and did not discuss the term at the July 25 hearing. In their notebook of exhibits presented at the hearing, the defendants include one page which supports their definition with a quote from the specification. *See* Defendants' *Markman* Exhibits, "Markman Presentation" Tab, at 22. This argument is disingenuous. The specification language quoted by the defendants is immediately followed by several sentences further defining "storage router." Indeed, the next sentence begins "Further, the storage router applies access controls . . . ." *See* '972 Patent, at 5:30. The defendants' attempt to limit the term "storage router" to one of several descriptive sentences in the specification is not well-taken. In addition, the Court finds the term "storage router," as used in all claims of the '972 patent, is adequately described by the additional language of the claims, which discloses in detail the various functions and/or qualities of the storage router. The Court will not further define this term.

VIII. "map"

This term is used in claims 1, 7, 10 and 11 of the '972 patent. The plaintiff contends the term means "to create a path from a device on one side of the storage router to a device on the other side of the router, *i.e.* from a Fibre Channel device to a SCSI device (or vice-versa). A 'map' contains a representation of devices on each side of the storage router, so that when a device on one side of the storage router wants to communicate to a device on the other side of the storage router, the storage router can connect the devices." *See* Plaintiff's Brief, at 22. The defendants argue the term means "to translate addresses." *See* Defendants' Brief, Ex. 2.

In support of their definition, the defendants point only to a dictionary definition of "map." *See* Defendants' Brief, at 13 and Ex. 4. The plaintiff, on the other hand, cites to specific portions of the specification that support its definitions of map (both as a verb and a noun) as used in the claims of the '972 patent. *See* Plaintiff's Brief, at 22 (citing '972 Patent, at 1:66 - 2:5 and 6:65 - 7:6). Because intrinsic evidence is far more salient than a dictionary definition, and because the Court agrees that the specification language cited by the plaintiff supports its construction of the term "map," the Court will adopt the plaintiff's proposed definition of this term.

IX. "Fibre Channel protocol unit" and "SCSI protocol unit"

These terms are used in claims 5 and 6 of the '972 patent. The plaintiff contends these phrases should be defined as "a portion of the Fibre Channel controller which connects to the Fibre Channel transport medium" and "a portion of the SCSI controller which interfaces to the SCSI bus." *See* Plaintiff's Brief, at 27. The defendants say the terms mean "block and equivalents thereof that connects to the Fibre Channel transport medium" and "block and equivalents thereof that connects to the SCSI bus transport medium." *See* Defendants' Brief, Ex. 2.

The defendants argue the means-plus-function analysis of § 112(6) should apply here because the terms are well-known and are not defined in two dictionaries cited by the defendants. *See* Defendants' Brief, at 7-8, 14-15, Ex. 4 and Ex. 5. However, the defendants do not indicate how the term should be defined in reference to the specification, and in fact contend "the '972 specification fails to reveal any structure corresponding to the claimed function." *See id.* at 8 and 15. The defendants then propose the word "block" should be used to describe these terms because the "protocol units" are "simply depicted as a block within the diagram of Figure 5" of the '972 patent. *See id.* This reasoning is wholly unpersuasive. Simply because a figure in the patent physically depicts the protocol units in a block-like shape, it does not follow that the units should be defined as "blocks or equivalents thereof." Under that reasoning, the SCSI storage devices, which are physically depicted as cylinders in the '972 patent, could be defined simply as "cylinders, oil drums or monkey barrels, or equivalents thereof." As the plaintiff correctly points out, the language of claims 5 and 6 plainly states that the "protocol units" for both devices are part of the "controllers" for the devices, and are intended to "connect" the devices to various "transport media" (*i.e.*, to various cables). *See* '972 Patent, at Claims 5 and 6. Accordingly, the Court adopts the plaintiff's definitions for these terms, and will construe the terms to mean "a portion of the Fibre Channel controller which connects to the Fibre Channel transport medium" and "a portion of the SCSI controller which interfaces to the SCSI bus."

X. "interface"

In their Joint Stipulation of Claim Construction, the parties claim the meaning of the term "interface" is in dispute. However, this phrase is not discussed in any of the parties' briefs, and neither side presented an argument at the July 25 hearing as to why the term is disputed. This term has a standard and ordinary meaning – even to a federal judge – and the Court will not further define it.

XI. Undisputed Terms

Finally, in their Joint Stipulation of Claim Construction, the parties have stipulated to the construction of 17 other terms in the '972 patent. The Court will therefore adopt these stipulated constructions, solely for the purpose of this lawsuit.

Accordingly, the Court enters the following order:

IT IS ORDERED that the attached construction of the patent claims will be incorporated into any jury instructions given in this cause and will be applied by the Court in ruling on the issues raised in summary judgment.

SIGNED on this 26th day of July 2000.

Sam Sparks
UNITED STATES DISTRICT JUDGE

CONSTRUCTION OF CLAIMS
U.S. PATENT NO. 5,941,972

Disputed Terms

The phrase "implements access controls for storage space on the SCSI storage devices" means provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device.

The phrase "allocation of subsets of storage space to associated Fibre Channel devices, wherein each subset is only accessible by the associated Fibre Chanel device" means subsets of storage space are allocated to specific Fibre Channel devices.

A "supervisor unit" is a microprocessor programmed to process data in a buffer in order to map between Fibre Channel devices and SCSI devices and which implements access controls.

A "SCSI storage device" is any storage device including, for example, a tape drive, CD-ROM drive, or a hard disk drive that understands the SCSI protocol and can communicate using the SCSI protocol.

The term "map" means to create a path from a device on one side of the storage router to a device on the other side of the router, *i.e.* from a Fibre Channel device to a SCSI device (or vice-versa). A "map" contains a representation of devices on each side of the storage router, so that when a device on one side of the storage router wants to communicate with a device on the other side of the storage router, the storage router can connect the devices.

A "Fibre Channel protocol unit" is a portion of the Fibre Channel controller which connects to the Fibre Channel transport medium.

A "SCSI protocol unit" is a portion of the SCSI controller which interfaces to the SCSI bus.

Stipulated / Undisputed Terms

A "buffer" is a memory device that is utilized to temporarily hold data.

A "direct memory access (DMA) interface" is a device that acts under little or no microprocessor control to access memory for data transfer.

A "Fibre Channel" is a known high-speed serial interconnect, the structure and operation of which is described, for example, in Fibre Channel Physical and Signaling Interface (FC-PH), ANSI X3.230 Fibre Channel Arbitrated Loop (FC-AL), and ANSI X3.272 Fibre Channel Private Loop Direct Attach (FC-PLDA).

A "Fibre Channel controller" is a device that interfaces with a Fibre Channel transport medium.

A "Fibre Channel device" is any device, such as a computer, that understands Fibre Channel protocol and can communicate using Fibre Channel protocol.

"Fibre Channel protocol" is a set of rules that apply to Fibre Channel.

A "Fibre Channel transport medium" is a serial optical or electrical communications link that connects devices using Fibre Channel protocol.

A "first-in-first-out queue" is a multi-element data structure from which elements can be removed only in the same order in which they were inserted; that is, it follows a first in, first out (FIFO) constraint.

A "hard disk drive" is a well known magnetic storage media, and includes a SCSI hard disk drive.

An "initiator device" is a device that issues requests for data or storage.

"Maintain(ing) a configuration" means keep(ing) a modifiable setting of information.

A "native low level, block protocol" is a set of rules or standards that enable computers to exchange information and do not involve the overhead of high level protocols and file systems typically required by network servers.

A "SCSI" (Small Computer System Interface) is a high speed parallel interface that may be used to connect components of a computer system.

A "SCSI bus transport medium" is a cable consisting of a group of parallel wires (normally 68) that forms a communications path between a SCSI storage device and another device, such as a computer.

A "SCSI controller" is a device that interfaces with the SCSI bus transport medium.

"Virtual local storage" is a specific subset of overall data stored in storage devices that has the appearance and characteristics of local storage.

A "workstation" is a remote computing device that connects to the Fibre Channel, and may consist of a personal computer.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
CERTIFICATE OF SERVICE UNDER 37 C.F.R. 1.248	Atty. Docket No. **CROSS1121-15**

OIPE JC163
MAR 2 8 2005
PATENT & TRADEMARK OFFICE

Applicant **Geoffrey B. Hoese, et al.**	
Application Number **90/007,124**	Date Filed **07/19/2004**
Title **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **2182**	Examiner **Fleming, Fritz**

Applicant hereby serves the Information Disclosure Statement, SBO8A and SBO8B forms, copies of references A1-A60, B1-B8 and C1-C38 and copies of References C39-C116, which are located on the attached CD-Rom, in the above referenced case to:

Larry E. Severin
Wang, Hartmann & Gibbs, PC
1301 Dove Street, #1050
Newport Beach, CA 92660

As per 35 U.S.C. §1.248 service is made via first class mail on March 24, 2005.

Respectfully submitted,

Sprinkle IP Law Group

John L. Adair
Reg. No. 48,828

Dated: March 24, 2005

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Enclosures

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
INFORMATION DISCLOSURE STATEMENT BY APPLICANTS	Atty. Docket No. (Opt.) **CROSS1121-15**

Applicants **Geoffrey B. Hoese et al.**	
Application Number **90/007,124**	Filed **07/19/2004**
For **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **2182**	Examiner **Fleming, Fritz M.**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

Certification Under 37 C.F.R. §1.8

I hereby certify that this document is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313 on **March 24, 2005.**

Janice Pampell
Janice Pampell

Applicants respectfully request, pursuant to 37 C.F.R. §§ 1.555, 1.56, 1.97 and 1.98, that the art listed on the attached SBO8-A and SBO8-B forms be considered and cited in the examination of the above-identified reexamination application. Since the present Application was filed after June 30, 2003, a copy of any U.S. Patent and any U.S. Patent Application Publications cited on the attached SBO8-A form is not being submitted with this Information Disclosure Statement pursuant to the waiver of 37 C.F.R. § 1.98(a)(2)(i) by the U.S. Patent and Trademark Office. Several documents are included on the enclosed CD-Rom for the convenience of the Examiner. If the Examiner would like hard copies of these documents, we will gladly provide them.

Furthermore, pursuant to 37 C.F.R. §§ 1.97(g) and (h), no representation is made that a search has been made or that this art is material to patentability of the present application. Applicants respectfully submit that the claims of Applicants' above-referenced patent is patentably distinguishable from these references. Applicants respectfully request consideration of these references. The Commissioner is hereby authorized to charge any fees due, or refund any credit, to Deposit Account No. 50-3183 of Sprinkle IP Law Group for any fee under 37 C.F.R. §1.17.

Respectfully submitted,

Sprinkle IP Law Group
Attorneys for Applicants

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Reg. No. 48,828

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PTO/SB/08A (04-03)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT			Application Number	90/007,124
			Filing Date	07/19/2004
			First Named Inventor	Hoese, Geoffrey
			Group Art Unit	2182
			Examiner Name	Fleming, Fritz M.
Sheet	1	OF 3	Attorney Docket Number	CROSS1121-15

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number: Number	Document Number: Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines Where Relevant Passages or Figures Appear
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	Filing Date	07/19/2004
	First Named Inventor	Hoese, Geoffrey
	Group Art Unit	2182
	Examiner Name	Fleming, Fritz M.
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			Filing Date	07/19/2004
			First Named Inventor	Hoese, Geoffrey
			Group Art Unit	2182
			Examiner Name	Fleming, Fritz M.
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Examiner Initials		FOREIGN PATENT DOCUMENTS Country Code Number	Kind Code *(if known)*	Publication Date MM-DD-YYYY (Number 43)	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines Where Relevant Passages or Figures Appear
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	B2	**GB 2297636**	**A**	**08/07/1996**	**Spring Consultants Limited**	
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	B5	**EP 0827059**	**A2**	**03/04/1998**	**NEC Corporation**	
	B6	**WO 99/34297**	**A1**	**07/08/1999**	**Crossroads Systems, Inc.**	
	B7	**GB 2341715**				
	B8	**JP 6301607**				

Examiner Signature		Date Considered	

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	Filing Date	July 19, 2004
	First Named Inventor	Hoese, Geoffrey
	Group Art Unit	2182
	Examiner Name	Fleming, Fritz M.
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	C2	Black Box, SCSI Fiberoptic Extender, Single-Ended, Product Insert, 2 pages, 1996.	6/18/1905
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				First Named Inventor	Hoese, Geoffrey
				Group Art Unit	2182
				Examiner Name	Fleming, Fritz M.
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	C21	InfoServer 150VXT Photograph	
	C22	Pictures of internal components of the InfoServer 150, taken from http://bindarydinosaurs.couk/Museum/Digital/infoserver/infoserver.php in Nov. 2004.	
	C23	Simplest Migration to Fibre Channel Technology, Article, Digital Equipment Corporation, November 10, 1997, published on PR Newswire	11/10/1997
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	C25	Compaq Storageworks HSG80 Array Controller ACS Version 8.3 (Configuration and CLI Refeence Guide) 11/98	
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	C27	Office Action dated 02/27/01 for 09/354,682 (CROSS1120-1).	02/27/2001
	C28	Office Action dated 08/11/00 for 09/354,682 (CROSS1120-1).	08/11/2000
	C29	Office Action dated 12/16/99 for 09/354,682 (CROSS1120-1).	12/16/1999
	C30	Office Action dated 11/06/02 for 10/023,786 (CROSS1120-4).	11/06/2002
	C31	Office Action dated 01/21/03 for 10/081,110 (CROSS1120-5).	01/21/2003
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	C38	European Office Action issued April 1, 2004 in Application No. 98966104.6-2413	04/01/2004
		Copies of the following are on the attached CD-Rom	
	C39	Defendant's First Supplemental Trial Exhibit List, Crossroads Systems, Inc., v. Chaparral Network Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001). **(CD-Rom)**.	
	C40	Defendant's Third Supplemental Trial Exhibit List, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001) **(CD-Rom)**.	
	C41	Defendant's Trial Exhibits, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001). **(CD-Rom)**.	
	C42	Defendants' Trial Exhibits, Crossroads Systems, Inc., v. Chaparral Network Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001). **(CD-Rom)**.	

FORM PTO 1449 US Department of Commerce Patent and Trademark Office			Application Number	90/007,124
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			First Named Inventor	Hoese, Geoffrey
			Group Art Unit	2182
			Examiner Name	Fleming, Fritz M.
Sheet	3	of 7	Atty Docket Number	CROSS1121-15

Examiner Initials	Cite No.	OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS	Date
	C43	Defendant Chaparral Network Storage, Inc.'s First Supplemental Trial Exhibit List (D1 through D271) (**CD-ROM** Chaparral Exhibits ExList_Def).	9/2/2001
	C44	Defendant Pathlight Technology Inc.'s Third Supplemental Trial Exhibit List (CD-ROM Pathlight Exhibits ExList_Def).	
	C45	Plaintiff's Fourth Amended Trial Exhibit List, Crossroads Systems, Inc. v. Chaparral Network Storage, Inc, C.A. No. A-00CA-217-SS (W.D. Tex. 2001) **(CD-Rom)**.	9/11/2001
	C46	Plaintiff's Revised Trial Exhibit List, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001). **(CD-Rom)**.	
	C47	Plaintiff's Trial Exhibits, Crossroads Systems, Inc. v. Chaparral Networks Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001). **(CD-Rom)**.	
	C48	Plaintiff's Fourth Amended Trial Exhibit List (**CD-ROM** Chaparral Exhibits ExList_Plaintiff).	9/11/2001
	C49	Plaintiff's Revised Trial Exhibit List (**CD-ROM** Pathlight Exhibits ExList_Plaintiff).	
	C50	Trial Transcripts, Crossroads Systems, Inc. v. Chaparral Network Storage, Inc., C.A. No. A-00CA-217-SS (W.D. Tex. 2001) **(CD-Rom)**.	
	C51	Trial Transcripts, Crossroads Systems, Inc. v. Pathlight Technology, Inc., C.A. No. A-00CA-248-SS (W.D. Tex. 2001). **(CD-Rom)**.	
	C52	Trial Exhibits and Transcripts, Crossroads v. Chaparral, Civil Action No. A-00CA-21755, W.D. Tex. 2000 (**CD-Rom** and hard copy printouts).	
	C53	Snively, "Sun Microsystem Computer Corporation: Implementing a fibre optic channel SCSI transport" 1994 IEEE, February 28, 1994, pp. 78-82.	
	C54	Datasheet for CrossPoint 4100 Fibre Channel to SCSI Router (Dedek Ex 41 (ANCT 117-120)) (**CD-ROM** Chaparral Exhibits D012).	
	C55	Symbios Logic- Software Interface Specification Series 3 SCSI RAID Controller Software Release 02.xx (Engelbrecht Ex 2 (LSI 1421-1658)) (**CD-ROM** Chaparral Exhibits D013).	12/3/1997
	C56	Press Release- Symbios Logic to Demonstrate Strong Support for Fibre Channel at Fall Comdex (Engelbrecht 12 (LSI 2785-86)) (**CD-ROM** Chaparral Exhibits D016).	11/13/1996
	C57	OEM Datasheet on the 3701 Controller (Engelbrecht 13 (LSI 01837-38)) (**CD-ROM** Chaparral Exhibits D017).	6/17/1905
	C58	Nondisclosure Agreement Between Adaptec and Crossroads Dated 10/17/96 (Quisenberry Ex 25 (CRDS 8196)) (**CD-ROM** Chaparral Exhibits D020).	10/17/1996

FORM PTO 1449 US Department of Commerce Patent and Trademark Office				Application Number	90/007,124
				Filing Date	July 19, 2004
				First Named Inventor	Hoese, Geoffrey
				Group Art Unit	2182
				Examiner Name	Fleming, Fritz M.
Sheet	4	of	7	Atty Docket Number	CROSS1121-15

Examiner Initials	Cite No.	OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS	Date
	C59	Organizational Presentation on the External Storage Group (Lavan Ex 1 (CNS 182242-255)) (**CD-ROM** Chaparral Exhibits D021).	4/11/1996
	C60	Bridge. C, Bridge Between SCSI-2 and SCSI-3 FCP (Fibre Channel Protocol) (**CD-ROM** Chaparral Exhibits P214).	
	C61	Bridge Phase II Architecture Presentation (Lavan Ex 2 (CNS 182287-295)) (**CD-ROM** Chaparral Exhibits D022).	4/12/1996
	C62	Attendees/Action Items from 4/12/96 Meeting at BTC (Lavan Ex 3 (CNS 182241)) (**CD-ROM** Chaparral Exhibits D023).	4/12/1996
	C63	Brooklyn Hardware Engineering Requirements Documents, Revision 1.4 (Lavan Ex 4 (CNS 178188-211)) (**CD-ROM** Chaparral Exhibits D024) by Pecone.	5/26/1996
	C64	Brooklyn Single-Ended SCSI RAID Bridge Controller Hardware OEM Manual, Revision 2.1 (Lavan EX 5 (CNS 177169-191)) (**CD-ROM** Chaparral Exhibits D025).	3/21/1996
	C65	Coronado Hardware Engineering Requirements Document, Revision 0.0 (Lavan Ex 7 (CNS 176917-932)) (**CD-ROM** Chaparral Exhibits D027) by O'Dell.	9/30/1996
	C66	ESS/FPG Organization (Lavan Ex 8 (CNS 178639-652)) (**CD-ROM** Chaparral Exhibits D028).	12/6/1996
	C67	Adaptec MCS ESS Presents: Intelligent External I/O Raid Controllers "Bridge" Strategy (Lavan Ex 9 (CNS 178606-638)). (**CD-ROM** Chaparral Exhibits D029).	2/6/1996
	C68	AEC-7313 Fibre Channel Daughter Board (for Brooklyn) Engineering Specification, Revision 1.0 (Lavan Ex 10 (CNS 176830-850)) (**CD-ROM** Chaparral Exhibits D030).	2/27/1997
	C69	Bill of Material (Lavan Ex 14 (CNS 177211-214)) (**CD-ROM** Chaparral Exhibits D034).	7/24/1997
	C70	AEC-. 4412B, AEC-7412/B2 External RAID Controller Hardware 0EM Manual, Revision 2.0 (Lavan Ex 15 (CNS 177082-123)) (**CD-ROM** Chaparral Exhibits D035).	6/27/1997
	C71	Coronado II, AEC-7312A Fibre Channel Daughter (for Brooklyn) Hardware Specification, Revision 1.2 (Lavan Ex 16 (CNS 177192-210)) (**CD-ROM** Chaparral Exhibits D037) by Tom Yang.	7/18/1997
	C72	AEC-4412B, AEC7412/3B External RAID Controller Hardware OEM Manual, Revision 3.0. (Lavan Ex 17 (CNS 177124-165)) (**CD-ROM** Chaparral Exhibits D036).	8/25/1997
	C73	Memo Dated 8/15/97 to AEC-7312A Evaluation Unit Customers re: B001 Release Notes (Lavan Ex 18 (CNS 182878-879)) (**CD-ROM** Chaparral Exhibits D038),	8/15/1997
	C74	Brooklyn Main Board (AES-0302) MES Schedule (Lavan Ex I9 (CNS 177759-763)) (**CD-ROM** Chaparral Exhibits D039).	2/11/1997
	C75	News Release-Adaptec Adds Fibre Channel Option to its External RAID Controller Family (Lavan Ex 20 (CNS 182932-934)) (**CD-ROM** Chaparral Exhibits D040).	5/6/1997
	C76	AEC-4412B/7412B User's Guide, Rev. A (Lavan Ex 21) (**CD-ROM** Chaparral Exhibits D041).	6/19/1905

FORM PTO 1449 US Department of Commerce Patent and Trademark Office			
		Application Number	90/007,124
		Filing Date	July 19, 2004
		First Named Inventor	Hoese, Geoffrey
		Group Art Unit	2182
		Examiner Name	Fleming, Fritz M.
Sheet 5	of 7	Atty Docket Number	CROSS1121-15

Examiner Initials	Cite No.	OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS	Date
	C77	Data Book- AIC-7895 PCI Bus Master Single Chip SCSI Host Adapter (Davies Ex 1 (CNS 182944-64)) (**CD-ROM** Chaparral Exhibits D046).	5/21/1996
	C78	Data Book- AIC-1160 Fibre Channel Host Adapter ASIC (Davies Ex 2 (CNS 181800-825)) (**CD-ROM** Chaparral Exhibits D047).	6/18/1905
	C79	Viking RAID Software (Davies Ex 3 (CNS 180969-181026)) (**CD-ROM** Chaparral Exhibits D048).	6/18/1905
	C80	Header File with Structure Definitions (Davies Ex 4 (CNS 180009-018)) (**CD-ROM** Chaparral Exhibits D049).	8/8/1996
	C81	C++ SourceCode for the SCSI Command Handler (Davies Ex 5 (CNS 179136-168)) (**CD-ROM** Chaparral Exhibits D050).	8/8/1996
	C82	Header File Data Structure (Davies Ex 6 (CNS 179997-180008)) (**CD-ROM** Chaparral Exhibits D051).	1/2/1997
	C83	SCSI Command Handler (Davies Ex 7 (CNS 179676-719)) (**CD-ROM** Chaparral Exhibits D052).	1/2/1997
	C84	Coronado: Fibre Channel to SCSI Intelligent RAID Controller Product Brief (Kalwitz Ex I (CNS 182804-805)) (**CD-ROM** Chaparral Exhibits D053).	
	C85	Bill of Material (Kalwitz Ex 2 (CNS 181632-633)) (**CD-ROM** Chaparral Exhibits D054).	3/17/1997
	C86	Emails Dated 1/13-3/31/97 from P. Collins to Mo re: Status Reports (Kalwitz Ex 3 (CNS 182501-511)) (**CD-ROM** Chaparral Exhibits D055).	
	C87	Hardware Schematics for the Fibre Channel Daughtercard Coronado (Kalwitz Ex 4 (CNS 181639-648)) (**CD-ROM** Chaparral Exhibits D056).	
	C88	Adaptec Schematics re AAC-340 (Kalwitz Ex 14 CNS 177215-251)) (**CD-ROM** Chaparral Exhibits D057).	
	C89	Bridge Product Line Review (Manzanares Ex 3 (CNS 177307-336)) (**CD-ROM** Chaparral Exhibits D058).	
	C90	AEC Bridge Series Products-Adaptec External Controller RAID Products Pre-Release Draft, v.6 (Manzanares Ex 4 (CNS 174632-653)). (**CD-ROM** Chaparral Exhibits D059).	10/28/1997
	C91	Hewlett-Packard Roseville Site Property Pass for Brian Smith (Dunning Ex 14 (HP 489) (**CD-ROM** Chaparral Exhibits D078).	11/7/1996
	C92	Distribution Agreement Between Hewlett-Packard and Crossroads (Dunning Ex 15 (HP 326-33) (**CD-ROM** Chaparral Exhibits D079).	
	C93	HPFC-5000 Tachyon User's Manuel, First Edition (PTI 172419-839) (**CD-ROM** Chaparral Exhibits D084).	5/1/1996
	C94	X3T10 994D - (Draft) Information Technology: SCSI-3 Architecture Model, Rev. 1.8 (PTI 165977) (**CD-ROM** Chaparral Exhibits D087).	
	C95	X3T10 Project 1047D: Information Technology- SCSI-3 Controller Commands (SCC), Rev, 6c (PTI 166400-546) (**CD-ROM** Chaparral Exhibits D088).	9/3/1996
	C96	X3T10 995D- (Draft) SCSI-3 Primary Commands, Rev. 11 (Wanamaker Ex 5 (PTI 166050-229)) (**CD-ROM** Chaparral Exhibits D089).	11/13/1996

FORM PTO 1449 US Department of Commerce Patent and Trademark Office	Application Number	90/007,124
	Filing Date	July 19, 2004
	First Named Inventor	Hoese, Geoffrey
	Group Art Unit	2182
	Examiner Name	Fleming, Fritz M.
Sheet 6 of 7	Atty Docket Number	CROSS1121-15

Examiner Initials	Cite No.	OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS	Date
	C97	VBAR Volume Backup and Restore (CRDS 12200-202) (**CD-ROM** Chaparral Exhibits D099).	
	C98	Preliminary Product Literature for Infinity Commstor's Fibre Channel to SCSI Protocol Bridge (Smith Ex 11; Quisenberry Ex 31 (SPLO 428-30) (**CD-ROM** Chaparral Exhibits D143).	8/19/1996
	C99	Letter dated 7/12/96 from J. Boykin to B. Smith re: Purchase Order for Evaluation Units from Crossroads (Smith Ex 24) CRDS 8556-57) (**CD-ROM** Chaparral Exhibits D144).	7/12/1996
	C100	CrossPoint 4100 Fibre Channel to SCSI Router Preliminary Datasheet (Hulsey Ex 9 (CRDS 16129-130)) (**CD-ROM** Chaparral Exhibits D145).	11/1/1996
	C101	CrossPoint 4400 Fibre Channel to SCSI Router Preliminary Datasheet (Bardach Ex. 9, Quisenberry Ex 33 (CRDS 25606-607)) (**CD-ROM** Chaparral Exhibits D153).	11/1/1996
	C102	Fax Dated 07/22/96 from L. Petti to B. Smith re: Purchase Order from Data General for FC2S Fibre to Channel SCSI Protocol Bridge Model 11 (Smith Ex 25; Quisenberry Ex 23; Bardach Ex 11 (CRDS 8552-55; 8558) (**CD-ROM** Chaparral Exhibits D155).	
	C103	Email Dated 12/20/96 from J. Boykin to B. Smith re: Purchase Order for Betas in February and March (Hoese Ex 16, Quisenberry Ex 25; Bardach Ex 12 (CRDS 13644-650) (**CD-ROM** Chaparral Exhibits D156).	
	C104	Infinity Commstor Fibre Channel Demo for Fall Comdex, 1996 (Hoese Ex 15, Bardach Ex 13 (CRDS 27415) (**CD-ROM** Chaparral Exhibits D157).	
	C105	Fax Dated 12/19/96 from B. Bardach to T. Rarich re: Purchase Order Information (Bardach Ex. 14; Smith Ex 16 (CRDS 4460)) (**CD-ROM** Chaparral Exhibits D158).	
	C106	Miscellaneous Documents Regarding Comdex (Quisenberry Ex 2 (CRDS 27415-465)) (**CD-ROM** Chaparral Exhibits D165).	
	C107	CrossPoint 4100 Fibre Channel to SCSI Router Preliminary Datasheet (Quisenberry) Ex 3 (CRDS 4933-34) (**CD-ROM** Chaparral Exhibits D166) (CD-ROM Chaparral Exhibits D166).	
	C108	CrossPoint 4400 Fibre to Channel to SCSI Router Preliminary Datasheet; Crossroads Company and Product Overview (Quisenberry Ex 4 (CRDS 25606; 16136)) (**CD-ROM** Chaparral Exhibits D167).	
	C109	Crossroads Purchase Order Log (Quisenberry Ex 9 (CRDS 14061-062)) (**CD-ROM** Chaparral Exhibits D172).	
	C110	RAID Manager 5 with RDAC 5 for UNIX V.4 User's Guide (LSI-01854) (**CD-ROM** Chaparral Exhibits P062).	9/1/1996
	C111	Letter dated May 12, 1997 from Alan G. Leal to Barbara Bardach enclosing the original OEM License and Purchase Agreement between Hewlett-Package Company and Crossroads Systems, Inc. (CRDS 02057) (**CD-ROM** Chaparral Exhibits P130).	
	C112	CR4x00 Product Specification (CRDS 43929) (**CD-ROM** Chaparral Exhibits P267).	6/1/1998

FORM PTO 1449 US Department of Commerce Patent and Trademark Office				Application Number	90/007,124
				Filing Date	July 19, 2004
				First Named Inventor	Hoese, Geoffrey
				Group Art Unit	2182
				Examiner Name	Fleming, Fritz M.
Sheet	7	of	7	Atty Docket Number	CROSS1121-15

Examiner Initials	Cite No.	OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS	Date
	C113	Symbios Logic – Hardware Functional Specification for the Symbios Logic Series 3 Fibre Channel Disk Array Controller Model 3701 (Engelbrecht Ex 3 (LSI-1659-1733) (**CD-ROM** Pathlight Exhibits D074).	
	C114	Report of the Working Group on Storage I/O for Large Scale Computing; Department of Computer Science Duke University: CS-1996-21 (PTI 173330-347). (**CD-ROM** Pathlight Exhibits D098).	
	C115	Brian Allison's 1999 Third Quarter Sales Plan (PDX 38)CNS 022120-132)) (**CD-ROM** Pathlight Exhibits D201).	6/5/2001
	C116	Brooklyn SCSI-SCSI Intelligent External RAID Bridge Definition Phase External Documentation (**CD-ROM** Pathlight Exhibits D129).	
Examiner Signature		Date Considered	

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C ...). The first artifact folder for an artifact type receives the letter A, the second B, etc.. Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

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Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

- [ ] CD(s) containing:
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    Doc Code: Artifact — Artifact Type Code: S
  - [ ] content unspecified or combined
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- [x] Stapled Set(s) Color Documents or B/W Photographs
  Doc Code: Artifact — Artifact Type Code: C
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- [ ] Video tape(s)
  Doc Code: Artifact — Artifact Type Code: V
- [ ] Model(s)
  Doc Code: Artifact — Artifact Type Code: M
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  Doc Code: Artifact — Artifact Type Code X
- [ ] Other, description: ____________________
  Doc Code: Artifact — Artifact Type Code: Z

March 8, 2004

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C ...). The first artifact folder for an artifact type receives the letter A, the second B, etc.. Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

(90/007,124UA)

Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

☑ CD(s) containing:

- ☐ computer program listing
  Doc Code: Computer — Artifact Type Code: P
- ☐ pages of specification and/or sequence listing and/or table
  Doc Code: Artifact — Artifact Type Code: S
- ☑ content unspecified or combined
  Doc Code: Artifact — Artifact Type Code: U

☐ Stapled Set(s) Color Documents or B/W Photographs
Doc Code: Artifact — Artifact Type Code: C

☐ Microfilm(s)
Doc Code: Artifact — Artifact Type Code: F

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☐ Model(s)
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Doc Code: Artifact — Artifact Type Code X

☐ Other, description: ____________________
Doc Code: Artifact — Artifact Type Code: Z

March 8, 2004

Reexam

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
CHANGE OF POWER OF ATTORNEY AND CORRESPONDENCE ADDRESS	Atty. Docket No. **CROSS1121-15**

Applicant **Geoffrey B. Hoese, et al.**	
Application Number **90/007,124**	Date Filed **07/19/2004**
Title **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **7590**	Examiner **Fleming, Fritz**
Confirmation Number: **2295**	

Applicant hereby served the attached Revocation and Power of Attorney and Change of Mailing Address on Third Party Requester at the address listed below:

Wang and Patel, PC
1301 Dove Street, Suite 1050
Newport Beach, CA 92660

As per 35 U.S.C. §1.248 service was made via first class mail on February 18, 2005.

Respectfully submitted,

Sprinkle IP Law Group

John L. Adair
Reg. No. 48,828

Dated: February 23 2005

1301 W. 25th Street, Suite 408
Austin, Texas 78705
Tel. (512) 637-9220
Fax. (512) 371-9088

Enclosures

sprinkle IP LAW GROUP

February 18, 2005

Natu J. Patel, Esq.
Wang & Patel PC
1303 Dove Street
Suite 1050
Newport Beach, CA 92660

Re: U.S. Reexam No. 90/007,123 filed 07/19/2004 (Our No. CROSS1120-14)
U.S. Reexam No. 90/007,124 filed 07/19/2004 (Our No. CROSS1121-15)
U.S. Reexam No. 90/007,126 filed 07/19/2004 (Our No. CROSS1122-16)
U.S. Reexam No. 90/007,125 filed 07/19/2004 (Our No. CROSS1123-17)
U.S. Reexam No. 90/007,127 filed 07/19/2004 (Our No. CROSS1128-18)

Dear Mr. Patel:

Applicant hereby serves the Revocation and Powers of Attorney in the above-referenced cases on:

Wang & Patel PC
1303 Dove Street
Suite 1050
Newport Beach, CA 92660

As per U.S.C. § 1.248, service is made via first class mail on February 18, 2005. These documents give Sprinkle IP Law Group the authority to transact all business with the U.S. Patent Office in connection with the above matters.

Sincerely,

Sprinkle IP Law Group

John L. Adair
jadair@sprinklelaw.com

JLA/jp
Enclosure

1301 W. 25th STREET, SUITE 408, AUSTIN, TX 78705
[o] 512.637.9220 [f] 512.371.9088

OIPE
FEB 2 8 2005
PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

REVOCATION AND POWER OF ATTORNEY AND CHANGE OF MAILING ADDRESS	Atty. Docket No. **CROSS1121-15**
Applicants **Geoffrey B. Hoese, et al.**	
Application No. **90/007,124**	Filing Date **07/19/2004**
For **Storage Router and Method for Providing Virtual Local Storage**	
Group Art Unit **7590**	Examiner **Fleming, Fritz**
Confirmation No. **2295**	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certification Under 37 C.F.R. §1.8

I hereby certify that this document is being transmitted to the COMMISSIONER FOR PATENTS via facsimile on 12/8/, 2004.

Janice Pampell
Janice Pampell

Dear Sir:

Crossroads Systems, Inc., 100% owner of the above-identified patent application, as evidenced by the Assignment recorded in the parent application on December 31, 1997 on Reel/Frame: 8929/0290, hereby revokes all previous Powers of Attorney and appoints the following attorneys under Customer No. 44654, all of the firm of SPRINKLE IP LAW GROUP, to prosecute the above-identified Patent and to transact all business in the Patent and Trademark Office connected therewith.

STEVEN R. SPRINKLE	Registration No. 40,825
JOHN ADAIR	Registration No. 48,828
ARI AKMAL	Registration No. 51,388

Direct all telephone calls and correspondence to:

Customer No. 44654
SPRINKLE IP LAW GROUP
1301 W. 25th Street, Suite 408
Austin, Texas 78705
Attn: Steven Sprinkle
Tel. (512) 637.9220 / Fax (512) 371.9088

I hereby state I am authorized to act on behalf of Crossroads Systems, Inc.

Respectfully submitted,

Crossroads Systems, Inc.

Dated: Dec 7, 2004

By: Robert Sims, President & CEO

02/24/05 14660 U.S. PTO

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Reexamination Appl. No.:	**90/007,124**	**CHANGE OF CORRESPONDENCE ADDRESS OF THIRD-PARTY REQUESTER FOR EX PARTE REEXAMINATION**
Reexam. Request Filed:	**July 19, 2004**	
Patent No.:	**6,421,753**	
Issued:	**July 16, 2002**	
Inventor:	**Hoese, et al.**	
Group Art Unit:	**2182**	
Examiner:	**Fleming, Fritz M.**	
Attorney Docket No.:	**I006-8930**	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CHANGE OF CORRESPONDENCE ADDRESS OF THIRD-PARTY REQUESTER FOR EX PARTE REEXAMINATION

Dear Sir:

Please change the correspondence address for notifications sent to the third-party requester in the above-referenced patent reexamination proceeding to:

Larry E. Severin
Wang, Hartmann & Gibbs, PC
1301 Dove Street, #1050
Newport Beach CA 92660
Telephone: (949) 833-8483
Fax: (949) 833-2281

The individual who originally requested this ex parte reexamination, Natu J. Patel, is no longer with our firm. Our firm does, however, continue to represent the parties upon whose behalf this request was made. Accordingly, our firm retains the right to receive copies of Office Actions or other correspondence from the Patent and Trademark Office that is sent to the third party requester in an ex parte reexamination proceeding under 37 C.F.R. §1.550.

A copy of this letter, including the certification of service, has been sent to the attorney of record of the patent owner, per 37 C.F.R. §1.33(c). Certification of service is enclosed.

February 18, 2005

Respectfully submitted,
Wang, Hartmann & Gibbs, PC
1301 Dove Street, #1050
Newport Beach CA 92660
(949) 833-8483

Larry E. Severin
Reg. No. 54606

Enclosures:

- Certificate of Service to Patent Owner

I hereby certify that this is being deposited with the United States Postal Service with sufficient postage as first class mail on the date indicated above in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450..

Dated: 2/18/05 Signed ____________
Print Name: Faiza Anwar

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the attached **Change Of Correspondence Address Of Third-Party Requester For Ex Parte Reexamination** was served upon counsel of record at each of the addresses below via U.S. Postal Service first class mail on February 18, 2005:

DLA PIPER RUDNICK GRAY CARY US, LLP
Atn: Mark Berrier
2000 University Avenue
E. Palo Alto CA 94303-2248

SPRINKLE IP LAW GROUP
1301 W. 25TH Street
Suite 408
Austin TX 78705

Date: February 18, 2004

Faiza Anwar

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/007,124	07/19/2004	6421753	I006-8930	2295

44654 7590 02/07/2005

SPRINKLE IP LAW GROUP
1301 W. 25TH STREET
SUITE 408
AUSTIN, TX 78705

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

UNITED STATES PATENT AND TRADEMARK OFFICE

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(THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS)

Natu J. Patel
WANG & PATEL, PC
1301 Dove Street, Suite 1050
Newport Beach, CA 92660

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. 90/007,124.

PATENT NO. 6,421,753.

ART UNIT 2182.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Office Action in Ex Parte Reexamination	Control No. 90/007,124	Patent Under Reexamination 6421753	
	Examiner Fritz M Fleming	Art Unit 2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

a☐ Responsive to the communication(s) filed on _____ . b☐ This action is made FINAL.
c☒ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter.
Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**
If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☒ Information Disclosure Statement, PTO-1449.
3. ☐ Interview Summary, PTO-474.
4. ☐ _____.

Part II SUMMARY OF ACTION

1a. ☒ Claims 1-8 are subject to reexamination.
1b. ☐ Claims _____ are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☐ Claims _____ are patentable and/or confirmed.
4. ☒ Claims 1-8 are rejected.
5. ☐ Claims _____ are objected to.
6. ☒ The drawings, filed on 7/19/2004 are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a)☐ approved (7b)☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All b)☐ Some* c)☐ None of the certified copies have
   1☐ been received.
   2☐ not been received.
   3☐ been filed in Application No. _____ .
   4☐ been filed in reexamination Control No. _____.
   5☐ been received by the International Bureau in PCT application No. _____.
   * See the attached detailed Office action for a list of the certified copies not received.
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. ☐ Other: _____

cc: Requester (if third party requester)

Reexamination

1. The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 6,421,753 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petal in view of Quam and Cummings.

Petal is competent art under 102(b) as its publication date is September 1996, more than one year prior to effective filing date (12/31/1997) of the instant patent.

Addressing claim 12 (the broadest independent claim), Petal provides virtual local storage (page 5, section 3, "This allows clients to access Petal virtual disks just like local disks." And page 7, section 3.2 "Petal provides clients with a large virtual disk that is available to all clients on the network.") in the form of the Figure 1 virtual disks in the form of Figure 6 SCSI disks (connected to one transport medium—SCSI) to devices connected to another transport medium in the form of the Petal clients connected to the Digital ATM Network. The method is shown to interface to the first transport medium (Digital ATM Network for the clients) and the second transport medium (SCSI for the disks) per Figure 6 via the overall Petal Virtual Disk storage servers of the Figure 2 physical view, which provides the actual interface between the two media. A mapping is shown per Figure 4 and the virtual to physical mapping and the section 2 discussion. Page 3 shows the 3 step mapping process to translate a client supplied virtual disk identifier into a global map identifier, to a given offset, to the physical mapping at the actual disk. Thus there is a mapping of the client devices to the storage devices in order to use the storage space. As far as "implements access controls for storage space on the storage devices" is concerned, this limitation is very broad in that it provides no specifics as to exactly what these controls are to be. Given this, page 7, column 2 sets forth "We currently do not provide any special support for protecting a client's data from other clients; however, it would not be difficult to provide security on a per virtual disk basis.", which is anticipatory, as this teaches an implementation of security access controls on a per virtual disk basis, if and when desired. Thus there is a clear teaching of an implementation of a security access control per virtual disk basis by protecting a client's data from other clients. Given a plain reading of this passage, it clearly teaches that a client is only able to access its own virtual disk. Finally, this access is allowed from the client devices to the storage devices "using native, low level, block protocols", as page 7, section 4, column 2 provides "Petal provides a disk-like interface that allows clients to read and write blocks of data." Section 3.2 provides "In all cases but one, the file system level performance of the Petal virtual disk is comparable to locally attached disks." Section 3, column 2, page 5 sets forth that access to the disks is provided using the UNIX raw disk interface. Page 1, column 2+, sets forth the concept of a "lower level service" and "block level storage system" and "An additional benefit is that the block-level interface is useful for supporting heterogeneous clients and client applications". Section 2, column 1, page 2 explicitly sets forth "As shown in Figure 2, Petal consists of a pool of distributed storage servers that cooperatively implement a single, block level storage system. Clients view the storage system as a collection of virtual disks " which anticipates the breadth of the claim language, as it only requires the use of "native, low level, block protocols." Also note page 8, column 2, which clearly states "Petal provides block level rather than a file level interface." Finally, page 1, column 1, sets forth specifically "To a Petal client, this collection appears as a highly available block-level storage system that provides large abstract containers called virtual disks. A virtual disk is globally accessible to all Petal clients on the network. A client can create a virtual disk on demand to tap the entire capacity and performance of the underlying physical resources." Thus the reference anticipates the native, low level, block protocols, as the clients view the storage as block level and hence access it using such protocols accordingly. The mapping between the workstations and the SCSI drives and access controls is maintained by the mapping of Figure 4, in order to maintain the configuration of the created virtual disks. Note the previously mentioned "for protecting a client's data from other clients...to provide security on a per virtual disk basis." As a client creates a virtual disk, and such can be kept private from other clients, then each virtual disk, which is a subset of the entire storage, is only accessible by that client to which it is mapped. Note also workstations are the clients, and SCSI hard disk drives are the storage devices.

When viewed per the Figures, Petal provides a storage router via the mapping of Figure 4. Figure 4 provides for the mapping and thus the storage routing of the translation of the client supplied virtual disk identifier to the actual physical disk. Per column 2, section 2, clients maintain minimal high level mapping information so as to properly route read and write requests to the "most appropriate" server. Thus "routing" is used to get the mapping from the client to the actual disk, and the mapping of Figure 4, which is the Petal servers taken as a whole, thus meeting the claimed "storage router" limitation. It is to be noted that the "storage router" is not further defined in any sort of a structural manner, therefore the Petal servers acting per Figure 4, anticipate what is claimed. Also note the "storage router" of the Petal system, interpreted to be all of the Petal system of Figure 6, absent the disks. Thus the access is allowed via block level protocols in accordance with the mapping and access controls. Thus the storage router is capable of configuring the SCSI devices to contain the virtual disks as requested by the client workstations. This configuration is maintained by the mapping of Figure 4.

Note that the "allowing" limitations of claims 4 are very broad. Claim 4 only requires that the "storage router"..."allowing access...using ..." without further specifying how or what "uses" these protocols. As the Petal system uses a block-level interface and blocks of data are read and written (i.e. section 3.1), the native, low-level block protocols are used, at least to the extent claimed. The same applies to the limitations of claim 12. Note also that per section 3, that both the Petal servers and clients run Digital Unix, so that the client is able to access Petal virtual disks just like local disks, which per section 4, page 7, column 2 results in "Petal provides a disk-like interface that allows clients to read and write blocks of data", and per section 6, column 2, page 8 has "Petal provides a block level rather than a file level interface.", thereby teaching the use of native, low level, block protocol. Finally, not section 1, which reads "A Petal virtual disk is a container that provides a sparse 64-bit byte storage space. AS with ordinary magnetic disks, data are read and written to Petal virtual disks in blocks", thereby providing for clear anticipation of what is claimed.

Petal, as discussed in detail above, teaches and anticipates a storage router for providing local storage on remote storage devices, but does not specify the Fibre Channel to connect the workstations to the SCSI disk arrays. Note that the network used to connect the clients to the virtual local storage is an ATM protocol based network.

Quam, as a whole, compares and contrasts ATM to Fibre Channel. Per pages 651-2, "Fibre Channel vs. ATM", it is clearly taught that Fibre-channel is better suited is better suited for a channel where large blocks of data are transferred between users, while ATM is suited for high speed switching with low latency.

Cummings, as a whole, teaches the use of Fibre-Channel so that the Disk Array and Tape Library are accessed using the same protocols (e.g. SCSI) as if they were connected to the user's local workstation, such that remote disk storage is regarded as private and can be accessed at the same level of performance and with comparable latency as any local disk, per pages 253-254 and Figure 2.

Therefore it would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify the teachings of Petal per those of Quam and Cummings so as to change from the ATM to a Fibre Channel network interconnecting the workstations to the SCSI drives, so as to be able to use Fibre Channel as the network to transfer large blocks of data (better suited for Fibre Channel vs. ATM) and to be able to access a disk array using the same SCSI protocol as if they were connected to the user's local workstation with the same latency and level of performance as a local disk with the Fibre Channel, the same as is done by Petal. Thus the references are properly combinable and provide express motivation to switch from an ATM to Fibre Channel network.

6. Claims 2,3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petal in view of Quam and Cummings, as applied to claims 8-10 and 12-16, further in view of Crouse et al.

Petal, as discussed in detail above, teaches a storage router for providing local storage on remote storage devices, but does not detail a buffer or supervisor connected to the two controllers. Note that the network used to connect the clients to the virtual local storage is an ATM protocol based network.

Finally, Crouse et al. show the specifics of a UNIX running network data server 14, that provides an interface between a Fibre Channel network 12b and the SCSI storage 46. Thus, per Figures 3 and 4, note a first controller 54 operable to connect to the Fibre Channel medium 12b, a second controller 68 connected to the SCSI bus and storage, with a buffer 64 providing memory work space to facilitate block transfers. A supervisor unit is seen as 60, to include the device microprocessor of Figure 4, and is thus operably coupled to both controllers 54 and 68, so that block oriented I/O operations can be carried out at maximum transfer rates to and from the storage 16, the controller 68, the buffer 64, the processor 54, and network 12.

Therefore it would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify Petal per the teachings of Quam, Cummings and Crouse et al. for the express purpose of using Fibre-Channel in place of ATM to take advantage of Fibre-Channel's ability to better transfer large blocks of data, to then use the Fibre Channel to obtain the same advantages of Petal in the form of Fibre Channel's ability to access a disk array using a SCSI protocol as if they were attached to the local workstation with access and latency comparable to local disk access per Cummings, with the specifics of controllers and buffer and supervisor running on a UNIX based network data server in order to carry out block transfers at maximum transfer rates per Crouse et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz M Fleming whose telephone number is 571-272-4145. The examiner can normally be reached on M-F, 0600-1500.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fritz M Fleming
Primary Examiner
Art Unit 2182

fmf

Notice of References Cited	Application/Control No. 90/007,124	Applicant(s)/Patent Under Reexamination 6421753	
	Examiner Fritz M Fleming	Art Unit 2182	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,394,526	02-1995	Crouse et al.	709/219
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Petal: Distributed Virtual Disks, Edward K. Lee and Chandramohan A. Thekkath, ACM SIGPLAN Notices, Volume 31, Issue 9, September 1996, pages 84-92.
	V	Systems Architecture Using Fibre Channel, Roger Cummings, Twelfth IEE Symposium on Mass Storage Systems, copyright 1993, IEEE. pages 251-256.
	W	Fibre Channel and ATM: The Physical Layers, Jerry Quam, WESCON/94, published 27-29 September 1994. Pages 648-652.
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application No.	Applicant(s)
	90/007,124	6421753
	Examiner	**Art Unit**
	Fritz M Fleming	2182

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
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Claim		Date								
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Search Notes	**Application No.** 90/007,124	**Applicant(s)** 6421753
	Examiner Fritz M Fleming	**Art Unit** 2182

SEARCHED			
Class	Subclass	Date	Examiner
710	129, 1-5, 8-13, 36-38, 100-101, 105, ~~126-131~~	1/21/05	FMF
714	42		
711	100, 112, 113		
710	305-316		

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)	DATE	EXMR
EAST NOTES ENCLOSED	1/21/05	FMF
NPL search: SCSI, FC, Fibre Channel, Storage, block level, native, ATM		

all considered 1/24/2005

FRITZ FL[illegible]
PRIMARY EXAMINER
GROUP 2100

Listing of Every Patent and Printed Publication Relied Upon

Printed Publication	Author	Publication Date	Where Found
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DIGITAL StorageWorks HSZ70 Array Controller HSOF Version 7.0 EK–HSZ70–SV. A01 Service Manual.	Digital Equipment Corporation	July, 1997	Exh. 5, MSJ Exh. 6
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High Performance Data Transfers Using Network-Attached Peripherals at the National Storage Laboratory	Hyer, et al.	February 26, 1993	Exh. 1
IFT-3000 SCSI to SCSI Disk Array Controller Instruction Manual Revision 2.0	Infortrend Technologies, Inc.	1995	Exh. 16
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Copies of all U.S. Patents are found in Exhibit 1

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4,603,380	Easton, et al.	July 29, 1986
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4,533,996	Hartung, et al.	August 6, 1985
4,504,927	Callan	March 12, 1985
4,455,605	Cormier, et al.	June 19, 1984
4,415,970	Swenson, et al.	November 15, 1983

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	19	scsi same (fibre adj channel) same interface same dma	USPAT	OR	OFF	2005/01/19 14:08
S1	71	storage adj2 router	USPAT	OR	OFF	2005/01/19 14:08
S2	24	scsi near5 ((fibre or fiber) adj channel) near storage	USPAT	OR	OFF	2005/01/13 07:22
S3	117	scsi near5 ((fibre or fiber) adj channel) near5 storage	USPAT	OR	OFF	2005/01/13 07:40
S4	49	scsi same ((fibre or fiber) adj channel) same storage	EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/01/13 10:27
S5	4	scsi same ((fibre or fiber) adj channel) same bridge	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/01/13 08:15
S6	97	scsi same ((fibre or fiber) adj channel) same bridge	USPAT	OR	ON	2005/01/13 07:58
S7	36	scsi same ((fibre or fiber) adj channel) same router	USPAT	OR	ON	2005/01/13 07:59
S8	197	scsi same ((fibre or fiber) adj channel) same adapter	USPAT	OR	ON	2005/01/13 07:59
S9	32	scsi same ((fibre or fiber) adj channel) same network same storage	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/01/13 08:17
S10	664	scsi same ((fibre or fiber) adj channel) same network same storage	US-PGPUB	OR	ON	2005/01/13 08:18
S11	302	scsi same ((fibre or fiber) adj channel) same network same storage	USPAT	OR	ON	2005/01/13 09:06
S12	76	scsi same ((fibre or fiber) adj channel) same (map or mapping)	USPAT	OR	ON	2005/01/13 09:20
S13	10	scsi same ((fibre or fiber) adj channel) same (map or mapping)	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/01/13 09:33
S14	0	scsi same ((fibre or fiber) adj channel) same (block adj level)	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/01/13 09:33
S15	3	scsi same ((fibre or fiber) adj channel) same (block adj level)	USPAT	OR	ON	2005/01/13 09:34
S16	10	scsi same ((fibre or fiber) adj channel) same native same block	USPAT	OR	ON	2005/01/13 09:37
S17	141	scsi same ((fibre or fiber) adj channel) same block same (storage or disk or disc or tape)	USPAT	OR	ON	2005/01/13 10:12
S18	10	scsi same ((fibre or fiber) adj channel) same (network adj attached adj storage)	USPAT	OR	ON	2005/01/13 10:13

S19	70	scsi same ((fibre or fiber) adj channel) and (network adj attached adj storage)	USPAT	OR	ON	2005/01/13 10:14
S20	1	(block adj level) same (network adj attached adj storage)	USPAT	OR	ON	2005/01/13 10:15
S21	74	scsi same ((fibre or fiber) adj channel) same shared same storage	USPAT	OR	ON	2005/01/13 10:17
S22	2944	(peer adj2 peer)	USPAT	OR	ON	2005/01/13 10:17
S23	23	(peer adj2 peer) same shared same storage	USPAT	OR	ON	2005/01/13 10:20
S24	42	(shared adj storage) same scsi	USPAT	OR	ON	2005/01/13 10:23
S25	200	network adj attached adj storage	USPAT	OR	ON	2005/01/13 10:52
S26	622	scsi same ((fibre or fiber) adj channel) same storage	USPAT	OR	OFF	2005/01/13 10:36
S27	738	scsi same ((fibre or fiber) adj channel) same interface	USPAT	OR	OFF	2005/01/13 10:43
S28	54	scsi same ((fibre or fiber) adj channel) same mapping	USPAT	OR	OFF	2005/01/13 10:43
S29	161	network adj attached adj storage	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/01/13 11:34
S30	51	block adj server	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/01/13 11:38
S31	163	block adj server	USPAT	OR	ON	2005/01/13 12:21
S32	28	network adj attached adj peripheral	USPAT	OR	ON	2005/01/13 13:15
S33	292	(710/74).CCLS.	USPAT	OR	OFF	2005/01/13 13:35
S34	84	(710/74).CCLS.	US-PGPUB	OR	OFF	2005/01/13 13:37
S36	2528	(711/111-114).CCLS.	USPAT	OR	OFF	2005/01/19 06:51
S37	332	((fibre or fiber) adj channel) same scsi same (storage or disk or disc) same controller	USPAT	OR	ON	2005/01/13 13:48
S38	592	network$ near5 storage near5 controller	USPAT	OR	ON	2005/01/14 08:27
S39	221	network$ near5 storage near5 controller	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/01/14 08:04
S40	1025	(711/111-114).CCLS.	US-PGPUB	OR	OFF	2005/01/19 06:35
S41	1337	(711/111,112).CCLS.	USPAT	OR	OFF	2005/01/19 07:39
S42	1495	(711/113,114).CCLS.	USPAT	OR	OFF	2005/01/19 08:25
S43	100	atm same scsi same ((fiber or fibre) adj channel)	USPAT	OR	OFF	2005/01/19 08:37
S44	372	atm same ((fiber or fibre) adj channel)	USPAT	OR	OFF	2005/01/19 08:41
S45	2894	S40 or S41 or S42 or S43 or S44	USPAT	OR	OFF	2005/01/19 08:41

S46	8	scsi same fibre same port same adaptor	USPAT	OR	ON	2005/01/19 12:35
S47	27	scsi same fibre same adaptor	USPAT	OR	ON	2005/01/19 12:37
S48	36	scsi same fibre same converter	USPAT	OR	ON	2005/01/19 12:39
S49	257	(710/315).CCLS.	USPAT	OR	OFF	2005/01/19 12:42

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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
90/007,124	07/19/2004	6421753	I006-8930

CONFIRMATION NO. 2295

OC000000014756996

OC000000014756996

44654
SPRINKLE IP LAW GROUP
1301 W. 25TH STREET
SUITE 408
AUSTIN, TX 78705

Date Mailed: 12/14/2004

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/08/2004.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

YOLANDA A VINES
3921 (571) 272-4327

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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
90/007,124	07/19/2004	6421753	I006-8930

CONFIRMATION NO. 2295

OC000000014756994

OC000000014756994

Gray Cary Ware & Friedenrich LLP
1221 S. MoPac Expressway Suite 400
Austin, TX 78746-6875

Date Mailed: 12/14/2004

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/08/2004.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

YOLANDA A VINES
3921 (571) 272-4327

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sprinkle IP LAW GROUP

1301 W. 25TH Street, Suite 408
Austin, Texas 78705
[o] 512.637.9220
[f] 512.371.9088

FAX COVER SHEET

TO:	U.S. Patent Office	**Fax#:**	703-872-9306
FROM:	Janice Pampell Patent Paralegal	**Client Matter #:**	CROSS1290 CROSS1590 CROSS1120-14 CROSS1120-15 CROSS1120-16 CROSS1120-17 CROSS1120-18
DATE:	12/08/04	**# of Pages:**	8
RE:	**Revocations and Powers of Attorney**		

Please contact 512.637.9225 if there is a problem with this transmission.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
REVOCATION AND POWER OF ATTORNEY AND CHANGE OF MAILING ADDRESS	Atty. Docket No. CROSS1121-16

Applicants Geoffrey B. Hoese, et al.	
Application No. 90/007,124	Filing Date 07/19/2004
For Storage Router and Method for Providing Virtual Local Storage	
Group Art Unit 7590	Examiner Fleming, Fritz
Confirmation No. 2295	

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Certification Under 37 C.F.R. 41.8

I hereby certify that this document is being transmitted to the COMMISSIONER FOR PATENTS via facsimile on 12/8/, 2004.

Janice Pampell
Janice Pampell

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Crossroads Systems, Inc., 100% owner of the above-identified patent application, as evidenced by the Assignment recorded in the parent application on December 31, 1997 on Reel/Frame: 8929/0290, hereby revokes all previous Powers of Attorney and appoints the following attorneys under Customer No. 44654, all of the firm of SPRINKLE IP LAW GROUP, to prosecute the above-identified Patent and to transact all business in the Patent and Trademark Office connected therewith.

STEVEN R. SPRINKLE	Registration No. 40,825
JOHN ADAIR	Registration No. 48,828
ARI AKMAL	Registration No. 51,388

Direct all telephone calls and correspondence to:

Customer No. 44654
SPRINKLE IP LAW GROUP
1301 W. 25th Street, Suite 408
Austin, Texas 78705
Attn: Steven Sprinkle
Tel. (512) 637.9220 / Fax (512) 371.9088

I hereby state I am authorized to act on behalf of Crossroads Systems, Inc.

Respectfully submitted,

Crossroads Systems, Inc.

Dated: Dec 7, 2004

By: [signature]
Robert Sims, President & CEO

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
90007124	07/19/04	6421753	1006-8930

Gray Cary Ware & Friedenrich LLP
1221 South MoPac Expressway , Suite 400
Austin, TX 78746-6875

EXAMINER	
Fleming, Fritz	

ART UNIT	PAPER
2182	5

DATE MAILED: 09/22/04

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

CC: Natu J. Patel
Wang & Patel, PC
1301 Dove Street, Suite 1050
Newport Beach CA 92660

PTO-90C (Rev.3-98)

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(THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS)

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. 90/007,124.

PATENT NO. 6421753.

ART UNIT 2182.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Order Granting / Denying Request For Ex Parte Reexamination	Control No.	Patent Under Reexamination	
	90/007,124	6421753	
	Examiner	**Art Unit**	
	Fritz M Fleming	2182	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

The request for *ex parte* reexamination filed 19 July 2004 has been considered and a determination has been made. An identification of the claims, the references relied upon, and the rationale supporting the determination are attached.

Attachments: a)☐ PTO-892, b)☐ PTO-1449, c)☐ Other: _____

1. ☒ The request for *ex parte* reexamination is GRANTED.

RESPONSE TIMES ARE SET AS FOLLOWS:

For Patent Owner's Statement (Optional): TWO MONTHS from the mailing date of this communication (37 CFR 1.530 (b)). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**

For Requester's Reply (optional): TWO MONTHS from the **date of service** of any timely filed Patent Owner's Statement (37 CFR 1.535). **NO EXTENSION OF THIS TIME PERIOD IS PERMITTED.** If Patent Owner does not file a timely statement under 37 CFR 1.530(b), then no reply by requester is permitted.

2. ☐ The request for *ex parte* reexamination is DENIED.

This decision is not appealable (35 U.S.C. 303(c)). Requester may seek review by petition to the Commissioner under 37 CFR 1.181 within ONE MONTH from the mailing date of this communication (37 CFR 1.515(c)). **EXTENSION OF TIME TO FILE SUCH A PETITION UNDER 37 CFR 1.181 ARE AVAILABLE ONLY BY PETITION TO SUSPEND OR WAIVE THE REGULATIONS UNDER 37 CFR 1.183.**

In due course, a refund under 37 CFR 1.26 (c) will be made to requester:

a) ☐ by Treasury check or,

b) ☐ by credit to Deposit Account No. _____, or

c) ☐ by credit to a credit card account, unless otherwise notified (35 U.S.C. 303(c)).

Fritz M Fleming

Fritz M Fleming
Primary Examiner
Art Unit: 2182

cc:Requester (if third party requester)

1. A substantial new question of patentability affecting claims 1-8 of United States Patent Number 6,421,753 is raised by the request for *ex parte* reexamination.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

- The threshold for determining whether or not to grant a re-examination is set forth in MPEP 2242, quoted below:

For "a substantial new question of patentability" to be present, it is only necessary that: (>A<) the prior art patents and/or printed publications raise a substantial question of patentability regarding at least one claim, i.e., the teaching of the (prior art) patents and printed publications is such that a reasonable examiner would consider the teaching to be important in deciding whether or not the claim is patentable; and (*>B<) the same question of patentability as to the claim has not been decided by the Office in a previous examination >or pending reexamination< of the patent or in a final holding of invalidity by the Federal Courts in a decision on the merits involving the claim. It is not necessary that a "prima facie" case of unpatentability exist as to the claim in order for "a substantial new question of patentability" to be present as to the claim. Thus, "a substantial new question of patentability" as to a patent claim could be present even if the examiner would not necessarily reject the claim as either fully anticipated by, or obvious in view of, the prior >art< patents or printed publications. As to the importance of the difference between "a substantial new question of patentability" and a "prima facie" case of unpatentability see generally In re Etter, 756 F.2d 852, 857 n.5, 225 USPQ 1, 4 n.5 (Fed. Cir. 1985).*

Thus it is clear, that a granting of a re-examination does not necessarily mean that a prima facie case of unpatentability exists, just that the teachings be important when deciding claim patentability.

- The manner in which the art is to be applied in the request is discussed in MPEP 2217, quoted below:

The third sentence of 35 U.S.C. 302 indicates that the "request must set forth the pertinency and manner of applying cited prior art to every claim for which reexamination is requested." 37 CFR 1.510(b)(2) requires that the request include "[a]n identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited prior art to every claim for which reexamination is requested." If the request is filed by the patent owner, the request for reexamination may also point out how claims distinguish over cited prior art.

Where substantial new questions of patentability are presented under 35 U.S.C. 102(f) or (g), the prior invention of another must be disclosed in a patent or printed publication. Substantial new questions of patentability may also be presented under 35 U.S.C. 103 which are based on the above indicated portions of 35 U.S.C. 102. Substantial new questions of patentability may be found under 35 U.S.C. 102(f) / 103 or 102(g)/ 103 based on the prior invention of another disclosed in a patent or printed publication if the reference invention and the claimed invention were not commonly owned at the time the claimed invention was made. See, 35 U.S.C. 103(c) and MPEP § 706.02(l). See MPEP § 706.02(l)(1) for information pertaining to references which qualify as prior art under 35 U.S.C. 102(e)/103.

The mere citation of new patents or printed publications without an explanation does not comply with 37 CFR 1.510(b)(2). Requester must present an explanation of how the cited patents or printed publications are applied to all claims which requester considers to merit reexamination. This not only sets forth the requester's position to the Office, but also to the patent owner (where the patent owner is not the requester).

Given the above, requestor has, at a threshold minimum, provided a substantial new question of patentability, albeit not in a clear and concise manner. For example, requestor has dedicated pages 5-44 to various "substantial new questions of patentability", which are not entirely clear. Pages 5-10 allege anticipation by the MAXSTRAT GEN5 PRODUCT, but such an analysis seems to rely upon two printed publications in the form of Exhibits 10-12 interpreted in light of an additional declaration in the form of Exhibit 13. Pages 10-11 allege other controllers detailed in Exhibits 14-16. Pages 12-13 allege anticipation over the '209 Patent. Pages 13-20 combine the material of pages 5-11 with admissions, Haugdahl, and Bursky. Pages 21-26 appear to combine admissions/testimony with at least patents to Berman, Malladi, Boggs et al., Purhoit, Llorens et al., Cuenod et al., Chatwani et al., Arrowood et al., Haughdahl, Oeda et al., Yung, Hefferon et al., DeKoning et al., Abadi et al., Hunnicutt et al., Raz et al., and Dauerer et al. Pages 27-30 then add Derby et al., Isfeld et al., Sheu and Jones et al. Pages 30-39 then address a subset of the above, while pages 39-41 seem to summarize such. In order to grant the request for re-examination, the request indicates, at least, that the requestor considers claims 1-8 as being unpatentable over the MAXSTRAT GEN5 manuals of Exhibits 11-12. It is agreed that the consideration of the MAXSTRAT GEN5 manuals of Exhibits 11-12 raises a substantial new question of patentability, as to at least the patentability of claims 1-8 of the Hoese et al. patent. As pointed out in Exhibit 10, MAXSTRAT GEN5 manuals of Exhibits 11-12 teach the use of, amongst other things, of a network routing table, a buffer, the host interface ports, the device module controller, the two general purpose CPUs, the volumes, the ifp, and

[redacted]

the internal file system which were not present in the prosecution of the application that became the Hoese et al. patent. Further, there is a substantial likelihood that a reasonable examiner would consider these teachings important in deciding whether or not the claims are patentable. Accordingly, the MAXSTRAT GEN5 manuals of Exhibits 11 and 12 raise a substantial new question of patentability as to claims 1-8, which question has not been decided in a previous examination of the Hoese et al. patent. Thus claims 1-8 will be re-examined.

Addressing the other art cited in the request for re-examination, it is clear that the request for the re-examination should clearly and concisely set forth the cited prior art and the manner in which it is to be applied to the identified claims. Requestor has instead set forth a voluminous citation of prior art, with an inordinately large number of possible combinations of cited art, placing the burden of "explanation" on the examiner. Appendix C is described by the requestor as "Listing of ***possible*** prior art combinations showing obviousness." Turning to Appendix C, one finds a generic explanation that summarizes claim 1 (only claim 1) into elements A-G, and refers to the chart of Appendix B and Exhibit 22 for an accounting of what elements are found where. The explanation of Appendix C seems to conclude with the opinion that the mere fact that two references that teach all of the elements render a claim as obvious. The examiner would like to point to **MPEP 2143.01, Suggestion or Motivation To Modify the References**, where one finds:

> **The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.** In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (Claims were directed

[redacted]

> to an apparatus for producing an aerated cementitious composition by drawing air into the cementitious composition by driving the output pump at a capacity greater than the feed rate. The prior art reference taught that the feed means can be run at a variable speed, however the court found that this does not require that the output pump be run at the claimed speed so that air is drawn into the mixing chamber and is entrained in the ingredients during operation. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).

For a specific example, appendix C, page 3, sets forth "Fibre Channel storage..." as a possible primary reference having claim elements ABCDFG with an astounding 54 individual secondary references with which "Fibre Channel storage..." is to be ***possibly*** combined with. The examiner is then supposed to go to Exhibit 22 to then interpret the shorthand of claim elements A-G of each reference in order to come up with the manner in which the cited art is to be applied in combination, thereby placing the burden on the examiner to provide the rationale to make the possible combinations. Furthermore, Exhibit 22 only covers claims 4-8 (in a cut up way that interleaves claims 5-8 with claim 4), and not the identified patent claims 1-8, noting that the explanation of Appendix C seems to interchange claims 1-4 throughout. Finally, if the requestor had intended to apply the 200+ "possible prior art combinations showing obviousness" against the claims to form a basis for re-examination, then there should be a corresponding number of prima facie cases of obviousness in order to merit re-examination. Lacking such, the material of Appendix C would appear to provide a cumulative IDS listing of references that individually disclose bits and pieces of claims 4-8, without setting forth the proper rejections under 35 U.S.C. 103.

2. The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 6,421,753 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

3. It is noted that an issue not within the scope of reexamination proceedings has been raised. The issue of the submission of references during prosecution of the patent will not be addressed in the course of this re-examination. The issue of the examination of related applications will not be addressed during the course of this re-examination, noting that some have matured into patents. The issue of secondary considerations and income/licensing will not be addressed during the course of this re-examination, unless raised by patent owner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz M Fleming whose telephone number is 703-308-1483. The examiner can normally be reached on M-F, 0600-1500.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 703-308-3301. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fritz M Fleming
Primary Examiner
Art Unit 2182

fmf

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REEXAM CONTROL NUMBER	FILING OR 371 (c) DATE	PATENT NUMBER
90/007,124	07/19/2004	6421753

#3

CONFIRMATION NO. 2295

Natu J. Patel, Esq.
Wang & Patel, PC
1301 Dove Street Suite 1050
Newport Beach, CA 92660

Date Mailed: 08/05/2004

NOTICE OF REEXAMINATION REQUEST FILING DATE

(Third Party Requester)

Requester is hereby notified that the filing date of the request for reexamination is 07/19/2004, the date the required fee of $2,520 was received.

A decision on the request for reexamination will be mailed within three months from the filing date of the request for reexamination. (See 37 CFR 1.515(a)).

A copy of the Notice is being sent to the person identified by the requester as the patent owner. Further patent owner correspondence will be the latest attorney or agent of record in the patent file. (See 37 CFR 1.33). Any paper filed should include a reference to the present request for reexamination (by Reexamination Control Number).

cc: Patent Owner

Gray Cary Ware & Friedenrich LLP
1221 S. MoPac Expressway Suite 400
Austin, TX 78746-6875

M. A. Smitty

Office of Patent Legal Administration
Central Reexamination Unit (703) 308-9692

PART 3 - OFFICE COPY

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REEXAM CONTROL NUMBER	FILING OR 371 (c) DATE	PATENT NUMBER
90/007,124	07/19/2004	6421753

CONFIRMATION NO. 2295 #4

REEXAM ASSIGNMENT NOTICE

Gray Cary Ware & Friedenrich LLP
1221 S. MoPac Expressway Suite 400
Austin, TX 78746-6875

Date Mailed: 08/05/2004

NOTICE OF ASSIGNMENT OF REEXAMINATION REQUEST

The above-identified request for reexamination has been assigned to Art Unit 2111. All future correspondence to the proceeding should be identified by the control number listed above and directed to the assigned Art Unit.

A copy of this Notice is being sent to the latest attorney or agent of record in the patent file or to all owners of record. (See 37 CFR 1.33(c)). If the addressee is not, or does not represent, the current owner, he or she is required to forward all communications regarding this proceeding to the current owner(s). An attorney or agent receiving this communication who does not represent the current owner(s) may wish to seek to withdraw pursuant to 37 CFR 1.36 in order to avoid receiving future communications. If the address of the current owner(s) is unknown, this communication should be returned within the request to withdraw pursuant to Section 1.36.

cc: Third Party Requester(if any)

Natu J. Patel, Esq.
Wang & Patel, PC
1301 Dove Street Suite 1050
Newport Beach, CA 92660

M. A. Swetty
Office of Patent Legal Administration
Central Reexamination Unit (703) 308-9692

PART 3 - OFFICE COPY

Patent Assignment Abstract of Title

* #2

Total Assignments: 3

Application #: 09001799 **Filing Dt:** 12/31/1997 **Patent #:** 5941972 **Issue Dt:** 08/24/1999

PCT #: NONE **Publication #:** NONE **Pub Dt:**

Inventors: GEOFFREY B. HOESE, JEFFRY T. RUSSELL

Title: STORAGE ROUTER AND METHOD FOR PROVIDING VIRTUAL LOCAL STORAGE

Assignment: 1

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008929/0290	02/06/1998	12/31/1997	03/19/1998	4

Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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RUSSELL, JEFFRY T. **Exec Dt:** 12/22/1997

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Assignment: 2

Reel/Frame:	Received:	Recorded:	Mailed:	Pages:
011284/0218	12/05/2000	11/16/2000	02/05/2001	8

Conveyance: SECURITY AGREEMENT

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Assignment: 3

Reel/Frame:	Received:	Recorded:	Mailed:	Pages:
012785/0083	04/17/2002	04/03/2002	06/12/2002	2

Conveyance: RELEASE

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Search Results as of: 8/4/2004 8 26:15 A.M.

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Web interface last modified: Oct. 5, 2002

* This case relates to serial number 09/354,682, filed on 07/15/99, Pat. no. 6,421,753, issued on 07/16/02.

ORM PTO—1520 (8-83)

REEXAMINATION

6,421,753

CONTROL NUMBER	CERTIFICATE DATE	CERTIFICATE NUMBER
6548 U.S. PTO 90007124 07/19/04		

CLASS	SUBCLASS	O.I.P.E	ART UNIT	EXAMINER
710	305	SCANNED ______ Q.A. ______	2111	

ITLE OF INVENTION (FOR DESIGN APPLICATION ONLY):

☐ TERMINAL DISCLAIMER	☐ The term of this patent subsequent to ______________ (date) has been disclaimed.	☐ The term of this patent shall not extend beyond the expiration date of Pat. No. ______________.	☐ The terminal ________ months of this patent have been disclaimed.

ISSUING CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)						
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
INTERNATIONAL CLASSIFICATION								
/								
/								
/								
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/								

☐ Continued on Issue Slip Inside File Jacket

Form PTO-2009 (Rev. 4-97)

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REQUESTER CORRESPONDENCE ADDRESS: PATENT OWNER ☐ THIRD PARTY ☒

Ketu J. Patel
Vang & Patel, PC
301 Dove Street, Suite 1050
Newport Beach CA 92660

COPENDING OFFICE PROCEEDINGS		PREPARED FOR CERTIFICATE
TYPE OF PROCEEDING	NUMBER	(Docket Clerk)
1.		REEXAMINED AND PASSED FOR CERTIFICATE
2.		
3.		(Primary Examiner) (Group)

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CONFIRMATION NO. 2295

SERIAL NUMBER	FILING OR 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
90/007,124	07/19/2004 RULE	710	2111	I006-8930

APPLICANTS

6421753, Residence Not Provided;
Crossroads Systems, Inc.(Owner), Austin, TX;
Natu J. Patel, Esq.(3rd Pty. Req.), Newport Beach, CA;

**** CONTINUING DATA ****************************

This application is a REX of 09/354,682 07/15/1999 PAT 6,421,753
which is a CON of 09/001,799 12/31/1997 PAT 5,941,972

**** FOREIGN APPLICATIONS ***********************

	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
Foreign Priority claimed ☐ yes ☐ no 35 USC 119 (a-d) conditions met ☐ yes ☐ no ☐ Met after Allowance Verified and Acknowledged ____ Examiner's Signature Initials			8	2

ADDRESS

Gray Cary Ware & Friedenrich LLP
1221 S. MoPac Expressway Suite 400
Austin ,TX 78746-6875

TITLE

STORAGE ROUTER AND METHOD FOR PROVIDING VIRTUAL LOCAL STORAGE

FILING FEE RECEIVED		
2520	FEES: Authority has been given in Paper No. _________ to charge/credit DEPOSIT ACCOUNT No. _________ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other ________________ ☐ Credit

07/19/04

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(Also referred to as FORM PTO-1465)

REQUEST FOR *EX PARTE* REEXAMINATION TRANSMITTAL FORM

Address to:
Mail Stop *Ex Parte* Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attorney Docket No.: I006-8930

Date: July 19, 2004

1. [X] This is a request for *ex parte* reexamination pursuant to 37 CFR 1.510 of patent number _6,421,753 B1______ issued __July 16, 2002 __________. The request is made by:

[ ] patent owner. [X] third party requester.

2. [X] The name and address of the person requesting reexamination is:

__Natu J. Patel, Esq., Wang & Patel PC______________________

__1301 Dove Street, Suite 1050______________________

__Newport Beach, CA 92660______________________

3. [X] a. A check in the amount of $_2520.00______ is enclosed to cover the reexamination fee, 37 CFR 1.20(c)(1);

[ ] b. The Director is hereby authorized to charge the fee as set forth in 37 CFR 1.20(c)(1) to Deposit Account No. ______________________ (submit duplicate of this form for fee processing); or

[ ] c. Payment by credit card. Form PTO-2038 is attached.

4. [X] Any refund should be made by [X] check or [ ] credit to Deposit Account No.______________. 37 CFR 1.26(c). If payment is made by credit card, refund must be to credit card account.

5. [X] A copy of the patent to be reexamined having a double column format on one side of a separate paper is enclosed. 37 CFR 1.510(b)(4)

6. [ ] CD-ROM or CD-R in duplicate, Computer Program (Appendix) or large table

7. [ ] Nucleotide and/or Amino Acid Sequence Submission
If applicable, all of the following are necessary.

a. [ ] Computer Readable Form (CRF)
b. Specification Sequence Listing on:

i. [ ] CD-ROM (2 copies) or CD-R (2 copies); **or**
ii. [ ] paper

c. [ ] Statements verifying identity of above copies

8. [ ] A copy of any disclaimer, certificate of correction or reexamination certificate issued in the patent is included.

9. [X] Reexamination of claim(s) __1 through 8 (all claims)______________________is requested.

10. [X] A copy of every patent or printed publication relied upon is submitted herewith including a listing thereof on Form PTO-1449 or equivalent.

11. [ ] An English language translation of all necessary and pertinent non-English language patents and/or printed publications is included.

12. [X] The attached detailed request includes at least the following items:

a. A statement identifying each substantial new question of patentability based on prior patents and printed publications. 37 CFR 1.510(b)(1)
b. An identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited art to every claim for which reexamination is requested. 37 CFR 1.510(b)(2)

13. [ ] A proposed amendment is included (only where the patent owner is the requester). 37 CFR 1.510(e)

14. [X] a. It is certified that a copy of this request (if filed by other than the patent owner) has been served in its entirety on the patent owner as provided in 37 CFR 1.33(c).
The name and address of the party served and the date of service are:

_Gray Cary Ware & Freidenrich, LLP, Atn: Tracy McCreight, Esq.,

_1221 S. MoPac Expressway, Suite 400

_Austin, TX 78746-6875

Date of Service: ___July 19, 2004___; or

[ ] b. A duplicate copy is enclosed since service on patent owner was not possible.

15. Correspondence Address: Direct all communication about the reexamination to:

[X] Customer Number: ***37819***

OR

[ ] Firm or Individual Name					
Address (line 1)					
Address (line 2)					
City		State		Zip	
Country					
Telephone		Fax			

16. [ ] The patent is currently the subject of the following concurrent proceeding(s):
[ ] a. Copending reissue Application No. ___.
[ ] b. Copending reexamination Control No. ___.
[ ] c. Copending Interference No. ___.
[ ] d. Copending litigation styled:

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___ *Authorized Signature*

__July 19, 2004___ *Date*

__Natu J. Patel___ *Typed/Printed Name*

___39559___ *Registration No., if applicable*

[ ] *For Patent Owner Requester*
[X] *For Third Party Requester*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: **Hoese, et al.** **Title of Invention:** **Storage router and method for providing virtual local storage** **Issued:** **July 16, 2002** **Patent No.:** **6,421,753**	:	**REQUEST FOR EX PARTE REEXAMINATION**

Mail Stop Ex Parte Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR EX PARTE REEXAMINATION

Dear Sir:

This is a Request for Ex Parte Reexamination of Claims 1 through 8 of the above identified United States Patent. It is believed that newly discovered prior art submitted herewith, which was not considered by the Patent Office during the prosecution of the above Patent, raises a substantial new question of Patentability with respect to Claims 1 through 8. Accordingly, reexamination under 35 U.S.C. §§ 302-307 pursuant to 37 C.F.R. § 1.510, et seq. is hereby respectfully requested.

In accordance with 37 C.F.R. § 1.510, the following is provided herein:

37 C.F.R. § 1.510(a)	Prior art cited under 37 C.F.R. § 1.501, infra. Fee for ex parte reexamination as per 37 C.F.R. 1.20(c)(1), $2,520.00, included with petition.

37 C.F.R. § 1.510(b)(1)	A statement indicating each substantial new question of Patentability based on prior Patents and printed publications, infra.
37 C.F.R. § 1.510(b)(2)	An identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited prior art to every claim for which reexamination is requested, infra.
37 C.F.R. § 1.510(b)(3)	A copy of every Patent or printed publication relied upon or referred to in paragraph (b)(1) and (2) of this section, with listing (Exhibit 1).
37 C.F.R. § 1.510(b)(4)	A copy of the entire Patent including the front face, drawings, and specification/claims (in double column format) for which reexamination is requested, and a copy of any disclaimer, certificate of correction, or reexamination certificate issued in the Patent (Exhibit 2).
37 C.F.R. § 1.510(b)(4)	A certification that a copy of the request filed by a person other than the Patent owner has been served in its entirety on the Patent owner at the address as provided for in § 1.33(c). The name and address of the party served must be indicated (Exhibit 3).

I. INTRODUCTION

This request is based upon numerous prior patents and printed publications, including 77 U.S. Patents and 6 printed articles, most of which were not previously considered by the Patent Office in granting the above-referenced patent. It is believed that Claims 1 through 8 of U.S. Patent No. 6,421,753 (the '753 Patent) are invalid:

1) pursuant to 35 U.S.C. §102 as being anticipated by the Maxstrat GEN5 controller product;
2) under 35 U.S.C. §103 as being obvious;
   i) in light of the patentees' deposition and trial testimony that the invention amounts to nothing more than simply adding "access controls" to a prior art storage router and such a simple modification was obvious in light of a number of patents, products and motivations to make such a combination; and
   ii) because motivations to combine the prior art inevitably would lead one skilled in the art to the arrive at the alleged invention embodied in the '753 Patent.

This request is served concurrently with a request for reexamination of U.S. Patent Nos. 5,941,972 (the '972 Patent), 6,425,035 (the '035 Patent), 6,425,036 (the '036 Patent), and 6,738,854 (the '854 Patent), collectively referred to as the "Related Patents." The '972 Patent was the parent of the Related Patents.

II. BACKGROUND

The invention described and claimed in U.S. Patent No. 6,421,753 ("the '753 Patent") is currently assigned to Crossroads Systems (Texas), Inc. ("Crossroads").

The '972 Patent was the parent of the Related Patents, and all five Patent specifications have identical figures and nearly identical written descriptions - the only differences can be found in the claims. A chart depicting the differences in the claims of the '972, '036, '035 and '854 Patents is included herein (Exhibit 4).

The '972 and '035 Patents are currently being litigated in the case of Crossroads Systems, Inc. v. Dot Hill Systems Corporation, Western District of Texas, Case Number A-03-CV-754(SS) ("*Crossroads v. Dot Hill*"). On June 26, 2004, Dot Hill submitted a Motion for Summary Judgment ("MSJ") to the Court, a copy of which is included herein. (Exhibit 5). The Motion requests a finding of invalidity based upon: 1) the '035 Patent being anticipated by, or rendered obvious in of, light prior art; and 2) the '972 Patent being obvious in light of prior art. The arguments in that motion are equally applicable to the '753 Patent, given the similarities of the '972 and '753 Patents.

Specifically, the MSJ argument is based primarily upon undisputed prior art in the form of the HSZ70 array controller designed and manufactured by Digital Equipment Corporation ("DEC") and related, published product manuals. Further, the MSJ contains three declarations from former DEC employees who were involved in the design and manufacture of the HSZ70 that clearly establish the date of conception, use, and publication of the manuals of the DEC HSZ70 as long before the earliest alleged conception dates for the '035, '753 and '972 Patents. (See Exhibit 5).

The HSZ70 product was on sale before the issuance of the '972, '035, '753 and Related Patents, yet the Patentees did not disclose this relevant prior art to the USPTO during the examination of the Patents. (See Exhibit 5). Even worse, Dot Hill's previous counsel gave to Crossroads' patent counsel copies of the HSZ70 manuals prior to the issuance of the '854 Patent, and yet the Patentees still did not disclose this relevant prior art to the USPTO during the examination of that patent. Dot Hill earnestly encourages the examiner to review the attached copy of the MSJ and corresponding declarations, which have been filed with the Court, to evaluate the impact of the DEC HSZ70 product literature on the portfolio of Related Patents. (See Exhibit 5).

Further, inventors Hoese and Russell have at least six (6) pending applications that are continuations claiming priority based upon the '972 Patent application filing date. The Application Numbers of the pending applications are 10/023786, 10/081082, 10/081110, 10/081114, 10/361283 and 10/658163. As each of these applications depends upon the '972 patent application, Dot Hill contends that each application suffers from the same critical infirmity as the '972 and '753 Patents. Dot Hill cannot pursue reexamination of the pending applications; nevertheless, Dot Hill respectfully requests that these applications and any other pending applications depending on the '972 Patent be examined in light of this reexamination petition and the petitions for the Related Patents.

III. PRIOR LITIGATION INVOLVING THE '972 PATENT

This is a unique case that presents the examiner with a wealth of information to assist in the reexamination.

The '972 Patent was litigated on two separate occasions and the Court has defined terms in the '972 Patent that apply equally to the '753 Patent as a result of a Markman Order in the case of Crossroads Systems, Inc. v. Chaparral Network Storage, Inc., Western District of Texas, Civil Action Number A 00 CA 217 SS ("*Chaparral*"). A copy of the Court's Markman Order appears in Exhibit 6. A district court's finding is binding upon the Patent examiner in a reexamination. Marlow Industries, Inc. v. Igloo Products Corp., 2002 WL 485698, *4 -5 (N.D.Tex.,2002) referring to In Re Freeman, 30 F.3d 1459, 1468 (Fed.Cir.1994) see also MPEP §2286. (Exhibit 7).

During the course of the '972 Patent litigation in the *Chaparral* case, the Patentees made a number of admissions under oath at deposition and at trial that have a direct bearing on the current reexamination and the scope of the patents at issue. Pursuant to MPEP §2217, Patentee admissions may be used in combination with Patents and printed publications to establish a substantial new question of Patentability.

Admissions are not restricted to just a determination of a substantial new question of Patentability. Under section 305, reexamination proceeds "...according to the procedures established for initial examination." 35 U.S.C.A. § 305, see also In re Portola

Packaging Inc. 122 F.3d 1473, 1475 (C.A.Fed.,1997) see also 37 C.F.R. 1.104 (c)(3). "Facts, including admissions which have already been established in the record, have been authorized for use in reexamination proceedings. See 37 CFR 1.106(c) and M.P.E.P. § 2258." Ex Parte the Successor in Interest of Robert S. McGaughey 1988 WL 252480, *4. (Exhibit 8). "In the initial examination of Patent applications, admissions by the applicant are considered for any purpose including evidence of obviousness under section 103." Id. "An admission is defined as an acknowledged, declared, conceded or recognized fact or truth. [FN14] Thus, admissions are simply facts." Id at *5.

IV. THE SCOPE OF THE INVENTION AS ADMITTED BY AN INVENTOR

During trial and deposition testimony in the *Chaparral* case, one of the two inventors of the '972, '753 and other Related Patents stated that the only invention claimed was the movement of access controls from a network server into the router device. Every other limitation in the claims of the '972 and '753 Patents, including the router device itself, was admitted to be prior art. *See* trial transcript of inventor Geoffrey Hoese, Exhibit 9, pages 70 to 72. According to the inventor, the novel feature of the claims is that the storage router, rather than a network server, performs access control such that each workstation may have controlled access to a specific partition of the storage device which forms the virtual local storage for that workstation ('753 Patent, column 4, lines 28-31). All other aspects of the alleged invention as set forth in figure 2 of the '972 and '753 Patents and the corresponding written description of the '972 and '753 Patents were acknowledged by the inventor Geoffrey Hoese, in his trial testimony in the *Chaparral* case, to be part of the prior art and not the invention.

> Q. Figure – well, figure 2 is not your invention, right, sir?
> A. **Figure 2 is not my invention.**
> Q. And this description is in reference to figure 2, and this description mentions native low-level block protocols and mentions mapping, and you say figure 2 is not your invention?
> A. That's correct.
> (Trial transcript of Hoese, page 81, starting at line 3, emphasis added)

* * *

See, *In re Nomiya*, 509 F.2d 566, 570-71, 571 n.5, 184 USPQ 607, 611, 611 n.4 (CCPA 1975) ("We see no reason why appellants' representations in their application should not be accepted at face value as admissions that Figs. 1 and 2 may be considered "prior art" for any purpose, including use as evidence of obviousness under § 103. [Citations omitted.] By filing an application containing Figs. 1 and 2, labeled prior art, *ipsissimis verbis*, and statements explanatory thereof, appellants have conceded what is to be considered as prior art in determining obviousness of their improvement.")

V. THE '753 PATENT IS INVALID AS IT IS ANTICIPATED BY THE MAXSTRAT GEN 5 PRODUCT

MaxStrat (previously known as Maximum Strategy) was a company that designed and manufactured RAID (redundant array of independent devices) controllers as well as entire storage systems, beginning in the early 1990s. In 1996, MaxStrat began shipping the GEN5 RAID controller, which was a router that performed the function of access controls and met each and every claim of the '972 and '753 Patents. (It should be noted that in the *Chaparral* case, the Court determined that the '972 Patent covered RAID controller devices, as they met the definition of "routers." Further, the devices accused by Crossroads in *Crossroads v. Dot Hill* are RAID controllers, like the GEN5.)

A chart is included in Exhibit 10 comparing elements described in the GEN5 System Guide and GUI User's Guide with each limitation in all claims of the '753 Patent. A copy of the *Gen5 S-SERIES XL System Guide Revision 1.01*, published June 11, 1996 ("System Guide"), is included as Exhibit 11, and a copy of the *Graphical User Interface for MAXSTRAT Gen5/Gen-S Servers User's Guide 1.1*, published January 6, 1997 ("GUI Guide"), is included as Exhibit 12. Both manuals were published before the alleged invention of the '753 Patent.

The GUI Guide describes the operation of the Gen5 S-Series Storage Server, which is documented in the System Guide.

"1.1.2 System Requirements

The GUI will function on all models of the Gen5 Storage Servers, at Gen5 software revision 1.60 or higher, and all models of the Profile NFS File Server at ProOS revision 0.82 and higher, and all models of the S-Series at software revision 1.00 or higher." [GUI Guide, page 1]

The GUI Guide expressly references the System Guide, which is incorporated by reference:

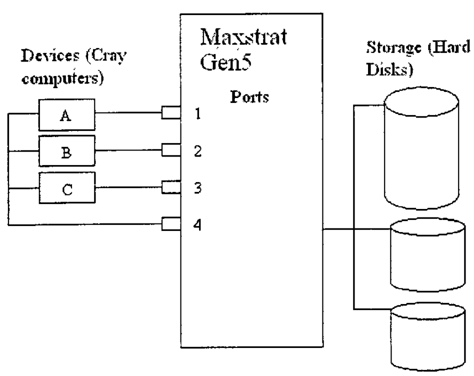
"1.1.3 Related Reference Material

...

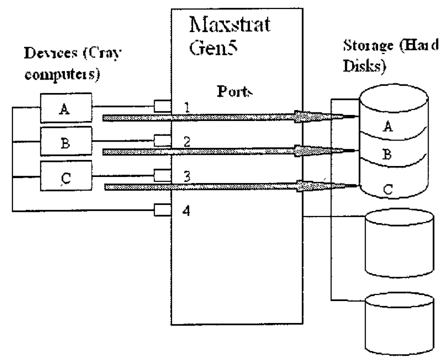
S-Series System Manual" [GUI Guide, page 2]

The GUI Guide and System Guide are a two-volume set that make a single publication. This printed publication describes each and every limitation of the Claims of the '753 Patent. The pertinency and manner of applying this printed publication to the '753 Patent is explained in the chart included in Exhibit 10, which compares elements of the Gen5 with each limitation in each of the claims of the '753 Patent.

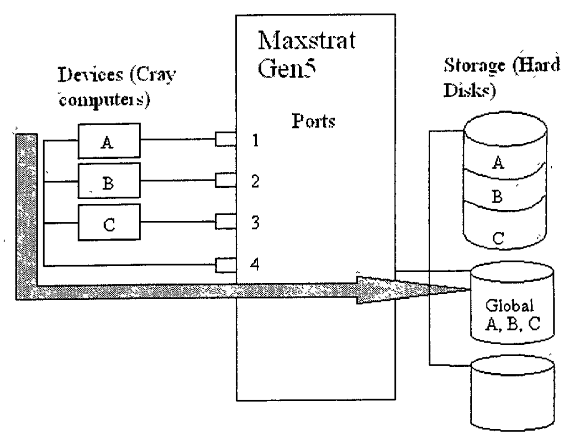
The GEN5 provides a number of devices such as Cray computers on one side of the GEN5 with access to storage devices such as hard disk drives on the other side of the GEN5. An outline of this configuration is shown below.



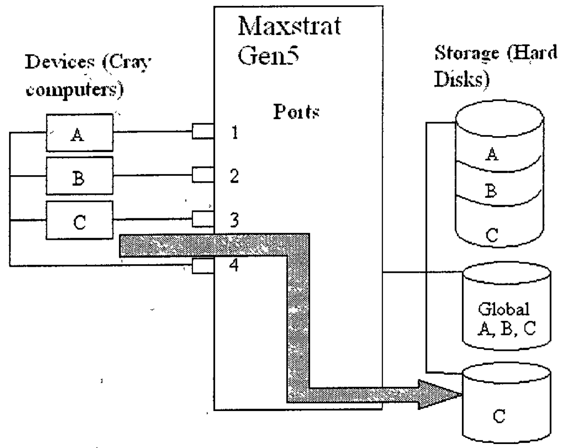
As to the "access control" limitation of the '972 and '753 Patents, the Gen5 is able to assign a specific storage area to a specific device. The GEN5 includes the "ifp" command, which includes the "luns bitmask enable" field. This field is used to specify the enabling of LUNs on interface ports to provide access to "facilities" (storage units). [See Exhibit 10, Claim chart, pages 5 and 6; see Exhibit 11, Gen5 System Guide, pages 4-42 to 4-43]. For example, each device attached to a GEN5 can be assigned a subset of a disk drive as shown below.



Alternatively, the GEN5 allows for a configuration where all the devices can access a global disk storage, as identified below.



Finally, the GEN5 can assign a device to a particular drive, again as displayed below.



Notably, this last configuration of the GEN5 was quite common and not an unreasonable extension of the product. (See *Hillgrave Corp. v. Symantec Corp.*, 265 F.3d 1336, 1343 (Fed.Cir. 2001) for a discussion of the reasonable use of a product involved in an infringement analysis). Review of the GEN5 documentation attached herein indicates that such a configuration was available. (Exhibit 13).

While GEN5 connected to storage devices using only the SCSI transport medium, Gen5 could be configured to use combinations SCSI, Fibre Channel and/or HIPPI transport media to connect to hosts.

In sum, the GEN5 allows access to a global data storage device, subsets of a single storage device, and access to a single storage device. This allocation of storage is what the Court in *Chaparral* identified as access control. (Exhibit 6). The GEN5 meets every element of the alleged invention of the '753 Patent.

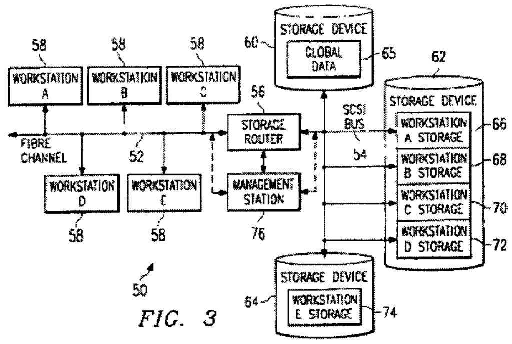


FIG. 3

In comparing the last configuration of the Gen5 (shown on the previous page) to an embodiment of the invention '753 Patent as shown in Fig. 3 of the '753 Patent specification above, it is clear that the GEN5 anticipates every element of the '753 Patent. The only difference between Fig. 3 and the last configuration of the GEN5 is that the workstations in Fig 3. are attached to a single Fibre Channel transport medium, while the workstations of the GEN5 are attached to separate Fibre Channel transport mediums.

However, it is important to note that Claim 1 of the '753 Patent does not require every Fibre Channel device to be connected to a single Fibre Channel transport medium. The chart below identifies an excerpt of Claim 1 that addresses this issue and a full detailed analysis appears in Appendix A. Further analysis in relation to the '753 Patent is presented in Appendices B and C.

'753 Patent claim 1		
Claim 1 states: 1. A data storage gateway capable of interfacing with and providing connectivity and mapping between a Fiber Channel and SCSI channel interface, the data storage gateway comprising:		
a virtual storage; a storage router in communication with and providing mapping to the virtual storage such that a fiber channel device remote from the virtual storage can communicate data to and from the virtual storage; and wherein the storage router is capable of configuring a SCSI device to contain at least a portion of the virtual storage.		This requires only a single fibre channel device and a single virtual storage. The GEN5 allows a device on the left side to communicate with a virtual storage on the right side of the GEN5. Containing a portion of the virtual storage is part of access control, which is also performed by the GEN5. Therefore the GEN5 meets every limitation of the '753 Patent claims.

Using even a single port to connect individual devices to GEN5 would be covered by claim 1. As a result, GEN5 completely anticipates the subject matter claimed in the '753 Patent and renders the '753 Patent invalid.

VI. THERE WERE OTHER CONTROLLERS ON THE MARKET PRIOR TO THE INVENTION OF THE '753 PATENT THAT PERFORMED ACCESS CONTROLS

In addition to the Maxstrat Gen5, there were other RAID controllers that performed access controls and were commercially available at the time of the alleged invention of the '753 Patent.

Storage Technologies, Inc. (known as "StorageTek") designed and manufactured the Iceberg RAID controller before 1997. Iceberg performed access control; Iceberg made selected hosts blind to selected storage based on the permission granted to those selected hosts. Iceberg connected a plurality of IBM mainframe host computers to partitions and subsets of multiple SCSI storage devices. As described in the '753 Patent, Iceberg contained a supervisor unit, which was coupled to a buffer, a host controller and a storage controller. The host and storage controllers included protocol units, FIFO buffers and DMA. Iceberg performed mapping to present a virtual Count-Key-Data disk interface to the hosts for the fixed-block allocation SCSI disk drives.

Similarly, CMD Technology, Inc. made the CRD-5500 SCSI RAID Controller before 1997. The CRD-5500 includes all the elements described in the '753 Patent. Features for access controls to partitions of disks and subsets of disks (called "redundancy groups") are explained in the *CRD-5500 SCSI RAID Controller User's Manual, Rev. 1.3*, published November 21, 1996, which is included as Exhibit 14.

> "The controller's Host LUN Mapping feature makes it possible to map RAID sets differently to each host. You make the same redundancy group show up on different LUNs to different hosts, or make a redundancy group visible to one host but not to another." (CRD-5500 User's Guide, page 1-1, Section 1.2).
>
> "4.3.3 Host LUN Mapping
> This screen may be used to map LUNs on each host channel to a particular redundancy group. Or you may prevent a redundancy group from appearing on a host channel. Thus, for example, you may map redundancy group 1 to LUN 5 on host channel 0 and the same redundancy group to LUN 12 on host channel 1. Or you may make redundancy group 8 available on LUN 4 on host channel 0 and block access to it on host channel 1." (CRD-5500 User's Guide, page 4-5, Section 4.3.3).

Finally, Infortrend Technologies, Inc. made the IFT-3000 before 1997. The IFT-3000 is also a SCSI RAID controller, and includes all the elements described in the '753 Patent except for the addition of Fibre Channel to the host interface, which is an obvious addition. A chart is included in Exhibit 15 comparing elements described in the IFT-3000 Instruction Manual with each limitation in Claim 1 of the '753 Patent. A copy of the *IFT-3000 SCSI to SCSI Disk Array Controller Instruction Manual Revision 2.0*, published in 1995, is included as Exhibit 16.

VII. THE '753 PATENT IS INVALID AS IT IS ANTICIPATED BY U.S. PATENT NO. 6,073,209 TO BERGSTEN

The '753 Patent is also anticipated by U.S. Patent No. 6,073,209 (the '209 Patent) titled "Data storage controller providing multiple hosts with access to multiple storage subsystems," to Bergsten, filed March 31, 1997, which was prior art as of the '753 Patent's effective filing date. A copy of the '209 Patent is included in Exhibit 1, and the claim chart comparing elements of this Patent to limitations in the claims of the '753 Patent is included in Exhibit 22. The '209 Patent describes a form of access controls using low level, block protocols. For example, the '209 Patent states in the ABSTRACT section:

> "Each storage controller may be coupled to at least one host processing system and to at least one other storage controller to control access of the host processing systems to the mass storage devices."

The '209 Further states, in column 15, lines 39 to 47:

> "A storage controller of the present invention further allows data blocks to be write protected, so that a block cannot be modified from any host computer. Write protection may be desirable for purposes such as virus protection or implementation of security firewalls. Write protection can be achieved by configuring the storage controller appropriately at set-up time or by inputting a write protect command to the storage controller from a host computer."

The '209 Patent thus describes how to control access of hosts to storage devices by allowing data blocks to be write protected from host computers. Since data blocks can be write protected, the '209 Patent describes a storage controller that limits a computer's access to subsets of storage devices or sections of a single storage devices, which is what the Court in *Chaparral* identified as access control (Exhibit 6). In addition, this explicit reference to security-oriented data protection provides strong motivation to a person of ordinary skill in the art to combine the '209 Patent and other prior art storage routers with enhanced security features.

The '209 Patent also includes all the remaining elements of the claims of the '753 Patent: a RAM buffer (column 6, line 26); a Fibre Channel controller (column 4, line 28); a SCSI controller (column 4, line 21); a CPU supervisor unit (column 6, line 26); and mapping (column 3, line 18). See Figure 3 from the '209 Patent, included below, depicting a STORAGE CONTROLLER with CPU, RAM, HOST DEVICE I/F (interface) with arrows leading TO/FROM HOST (Fibre Channel transport medium), and STORAGE DEVICE I/F with arrows leading TO/FROM LOCAL EXTERNAL STORAGE DEVICES (SCSI bus transport medium).

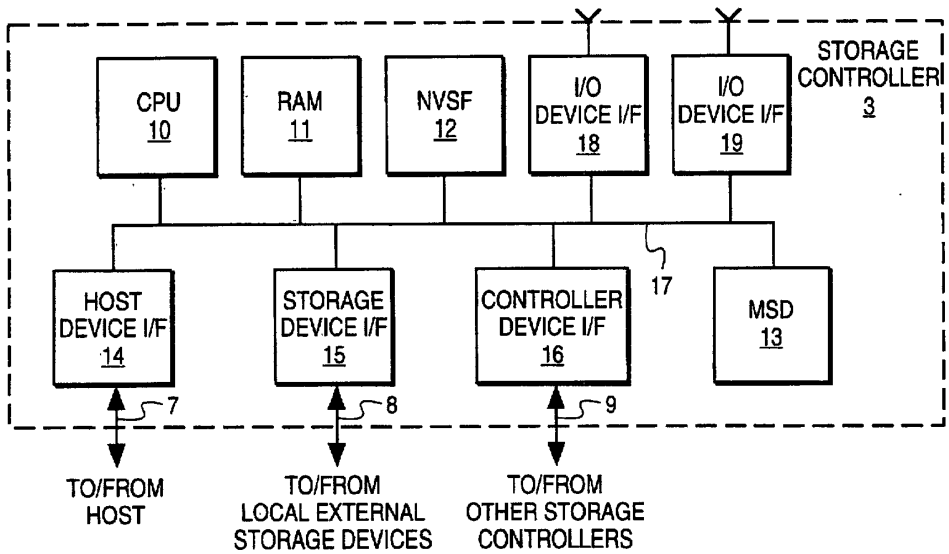


FIG. 3

Thus, the '209 Patent anticipates the '753 Patent, or in the alternative, provides strong intrinsic motivation to combine a Fibre Channel to SCSI storage router with access control.

VIII. THE ALLEGED INVENTION OF THE '753 WAS OBVIOUS IN LIGHT OF THE PRIOR ART AND NUMEROUS MOTIVATIONS TO COMBINE

The Obviousness Standard.

"... [T]he standard under 35 U.S.C. § 103 [for obviousness] is what would have been obvious to one of ordinary skill in the art, and the level of the skilled artisan should not be underestimated. See *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985)." *Ex Parte Richard A. Flasck*, 2000 WL 33520310, *3. (Exhibit 17). Factors that may be considered in determining level of ordinary skill in the art include: (1) the education level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) education level of active workers in the field. Environmental Designs v. Union Oil Co. of Cal., 713 F.2d 693, 696-697 (Fed.Cir.1983), cert. denied, 464 U.S. 1043, 104 S.Ct. 709, 79 L.Ed.2d 173 (1984) see also *Orthopedic Equipment Co., Inc. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376 at 1381-1382 (Fed.Cir.1983). The level of one of ordinary skill is evaluated at the time the invention was made. Id at 1382.

<u>The Field of Endeavor.</u>

The first question in an obviousness argument is whether the references are in the field of the inventor's endeavor. *In re Deminski*, 796 F.2d 436, 230 U.S.P.Q. 313, (Fed.Cir., Jul 08, 1986). The field of art that encompasses the '753 Patent, as well as the Related Patents, is that of computer science and electronics. Some of the hardware identified in the '753 Patent includes routers, networks, bridges, servers, controllers, storage devices, storage disks, microprocessors, buffers, storage controllers, and workstations. The prior art would encompass, at least, the fields of computer science and electronics as it relates to the hardware discussed above.

It is common knowledge that the computer science and electronics field is one that has experienced, and continues to experience, rapid development and complexity in hardware and software. As a result, a person skilled in the art would be someone with a degree in Computer Science, Electrical Engineering or an equivalent, with perhaps seven or more years of professional experience, and with knowledge of at least computer hardware, systems, electronics, and software in such an area of rapid innovation.

The Motivation to Combine

Identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant. *In re Kotzab*, 217 F.3d 1365, 1369-1370 (C.A.Fed., 2000).

Obviousness and Motivation to Combine in Light of the 1984 Byte Magazine Article

As has already been discussed, one of the two inventors of the '972 and '753 Patents admitted under oath that the only limitation of the '972 (and '753) Patents that is not taught by prior art is the movement of access controls from the network server to the router. This petition has identified no less than four RAID controllers – or "routers" – (five if one includes the DEC HSZ70 RAID controller) that performed access controls. However, even if one were to ignore those prior art RAID controllers, the movement of access controls from the network server into the router would have been obvious in light of an article published in Byte Magazine in 1984.

Further, the GEN5 prior art RAID controller discussed above connected to Fibre Channel hosts on one end and SCSI storage devices on the other, just like the device described in the '753 patent. However, the remainder of the RAID controllers connected to hosts and storage devices using other protocols. The decision to connect the router described in the '753 Patent to hosts through the Fibre Channel transport medium, and to connect the router to storage devices through the SCSI transport medium would have been obvious in light of the 1984 Byte Magazine article.

"Local-Area Networks for the IBM PC" was written by J. Scott Haugdahl ("*Haugdahl*") and published in the December 1984 edition of Byte Magazine. Byte

Magazine is a widely-read computer magazine and publicly available. (Exhibit 18). The *Haugdahl* article teaches the following:

- A need to preserve the benefits of a stand-alone personal computer system while obtaining the benefits from networking.

> "Thus, with LANs you want to preserve the benefits of stand-alone microcomputers, namely, use of your favorite software and peripherals and having a machine all to yourself, as well as adding new benefits from networking." (p. 147, col. 2).

Network benefits known at the time of the invention included access controls and mapping. This reference, however, is not limited to just networks, but provides motivation to develop systems other than networks that have some desirable network characteristics.

- A trend in the industry toward using open systems that follow published specifications, such as Fibre Channel and SCSI protocols.

> "Most systems that follow de facto standards, such as Ethernet or Arcnet, and those that follow 'committee' standards, such as IEEE-802 or those of the National Bureau of Standards, tend to be open systems." (p. 147, col. 3).

Fibre Channel and SCSI were available during the time of the alleged '753 invention.

- Access controls that enabled only a particular user to access data.

> "Because all these servers support multiple users, you're going to need some sort of password protection scheme, as well as some means of protecting the data of one user from another." (p.151).

This clearly teaches restricting access to stored data. It is not limited to any particular implementation and could very well be the impetus to use such schemes as LUN masking.

- Servers were known to be a potential bottleneck problem.

"However, the server is a potential bottleneck, particularly if you don't go with a high-performance processor." (p. 154, col. 3).

Bottlenecks were a well known problem and a person skilled in the art would be sensitive to alternatives, such as having the router perform access controls, as opposed to the server.

- Implementing access controls at a low level.

"Disk service users' requests for disk I/O (input/output) at a low level. ... Thus the server is really a disk 'volume' server, and file I/O is handled directly by the operating system in the PC." (p. 154, col. 3).

Here is the connection between native low-level protocols as used by a personal computer and the difference as it existed in 1984 for file servers.

- Access control and virtual local storage.

"EtherShare manages virtual disks at the volume level. Passwords are required to 'log on' and optional passwords can be placed on volume. Volumes can be made private for individual use only, public for use by several users in a read-only fashion, and shared for multiple read/write access." (p. 156, col.2).

"[Regarding Corvus] It was simply a device that allowed you to share a hard disk by partitions." (p. 163, col. 3). "[Regarding Nestar] [I]n fact, if you had two PLAN 4000 systems with a gateway server, you could establish virtual connections with disks on other network file servers and use them as if they were local." (p. 166, col. 3).

Virtual access to disks, security-oriented access control, private and shared hard disks, and use of remote storage devices having the appearance and characteristics of local storage were well documented and available to consumers at least as early as 1984.

The article further highlights numerous disadvantages to using file servers for the performance of certain functions and directly indicates how handling a file with a personal computer's I/O is more direct. The type of I/O endemic to the personal computer is a native low-level block protocol. A person skilled in the art would realize that a remote storage device, like that provided by a file server, would be more desirable if it utilized the I/O handling like that of a personal computer. Further, a person skilled in the art would realize that other network-like options would be desirable. Those options would include access control.

Obviousness and Motivation to Combine in Light of the 1995 *Bursky* Article

Similar to the *Haugdahl* article, Dave Bursky wrote an article that appeared in the February 6, 1995 edition of "Electrical Design" entitled "New Serial I/O Speed Storage Subsystems" (Exhibit 19) that also teaches the desirability of connecting workstations to a storage controller or router via the Fibre Channel protocol.

- The Bursky article teaches that Fibre Channel helps relieve problems with remote, high-speed devices, such as noise, signal integrity, speed, and bulky cables.

> "Using a serial interface also helps relieve one of the largest headaches when it comes to connecting many high-speed devices together - noise and signal integrity. ... Therefore, to achieve top performance, long parallel cables must be eliminated to control impedance, minimize crosstalk, and allow data transfers to run at maximum speeds. ... The FC drives eliminate the need for large connectors and bulky SCSI cable." (*Bursky*, p. 81, col. 2 to p. 82, col. 1.)

- The Bursky article teaches that Fibre Channel chips were commercially available.

> "Aside from Seagate's disk drives, only a handful of FC storage interfaces are immediately available and just a few companies offer any silicon. The smattering of chips on the market include several choices from Applied Micro Circuits, Hewlett-Packard (G-Logic chip set), LSI Logic (megacells), Microelectronics Technology Center, NCR, Rockwell International, TriQuint Semiconductor, and Vitesse Semiconductor." (*Bursky*, p. 88, col. 3.)

The Bursky article expounds the virtues of Fibre Channel and lists several manufacturers from which Fibre Channel controllers for storage interfaces can be acquired.

One of the Inventors Admitted To Obviousness and a Motivation to Combine.

In fact, one of the inventors of the '972 and '753 Patents testified under oath in the *Chaparral* litigation that a person skilled in the art would have known at the time of the filing of the '972 and '753 Patents that various known and readily identifiable problems would be solved by: 1) connecting the prior art router described in the '972 and '753 Patents to hosts by way of the Fibre Channel transport medium, and; 2) performing the access control function in the router, as opposed to the network server.

> "...there's a general need in computing to increase the addressability of devices, of storage devices, for example. There's a general need to increase the speed of communication to those devices. There's a general need to increase the distance over which you can communicate to devices. And most fundamentally, I'd say that was the set of capabilities that we were interested in providing solutions for; and in doing so, you know the, for example, fibre channels, in general technology addresses a number of those issues over and beyond the benefits of previous technologies. And to, that's you know, that's a nice, general set of problems that were addressed."
> (Deposition of Hoese, page 125-126.) (Exhibit 20).

> "...the main problem is the network server is expensive to maintain, it has various bottlenecks in transferring data between these things, has to go through a lot of effort to translate the data requests, get the data from one side to the other."
> (Trial transcript of Hoese, page 59-60.) (See above).

There is no indication that the general needs spoken of by Hoese constituted a unique problem known only by the Patentees, or that the Patentees forever solved these general needs with their alleged invention, or that there was a long felt need to solve these problem that now ceases to exist due to the Patentees alleged invention. Finally, it is clear that the Patentees did not discover the source of any of these general needs or their solutions; the needs and solutions were known to the industry at the time.

The Patentees sworn testimony shows that a person skilled in the art at the time of the alleged invention embodied in the '753 Patent would have been acutely aware of a variety of needs in the field. These needs provide the motivation for a person skilled in the art to seek a solution.

IX. ADDITIONAL PRIOR ART THAT ADDRESSES EACH OF THE GENERAL NEEDS AS IDENTIFIED BY THE SWORN TESTIMONY OF THE INVENTORS

We believe that the prior art RAID controllers discussed herein, the magazine articles, and the testimony of the inventors of the '753 are reason enough to find that the '753 Patent should have never issued. However, in the interests of bringing all prior art to the attention of the examiner and the Patent Office, we supply, below, additional prior art that addresses each of the needs as identified by the inventors in sworn testimony.

Increased speed

Increasing the speed at which data was transferred from a host to storage and back again was one problem identified by testimony of the inventors, supra, and was commonly known throughout the industry. As already discussed above, it was well known in the prior art at the time of the '753 Patent invention that the Fibre Channel protocol was extremely fast and operated above 1 gigabit per second in transmission speed. See Berman, U.S. Patent No. 6,185,203, see also U.S. Patent No. 5,638,518 to Malladi, filed October 24, 1994 and issued June 10, 1997 starting at Column 2, Line 54. Use of Fibre Channel was available and would have been an obvious selection to one skilled in the art. (Exhibit 1).

Reduction of data translation requests

Concerning the reduction of translation of data requests, it was also well known in the prior art that Fibre Channel and SCSI shared a common protocol. In particular, the highest level in the Fibre Channel standards set, FC-4, defines the mapping between the lower levels of the Fibre Channel and SCSI command sets. U.S. Patent No. 6,185,203 to Berman at Column 6, starting at line 18, identified as prior art as of the filing date of February 18, 1997. This well known prior art commonality reduces any need for data translation between Fibre Channel and SCSI protocols. "Multiple protocols such as SCSI (Small Computer Serial Interface), IP (Internet Protocol), HIPPI, ATM (Asynchronous

Transfer Mode) among others can concurrently utilize the same media when mapped over Fibre Channel." Id. Abstract. "One of the reasons that Fibre Channel is so popular is that one of the payloads and upper level protocols which can be mapped, is the protocol for SCSI." U.S. Patent No. 5,959,994 to Boggs, et al, filed August 19, 1996, issued September 28, 1999, statement appearing as prior art starting at Col. 3 at Line 11. (Exhibit 1).

The connection between Fibre Channel and SCSI allows for the transmission of data using Fibre Channel low-level block protocols. U.S. Patent No. 5,638,518 to Malladi, filed October 24, 1994 and issued June 10, 1997 starting at Column 2, Line 54. A person skilled in the art at the time of the alleged invention of the '753 Patent would have found it obvious to use a combination of Fibre Channel and SCSI protocols to connect a router to hosts and storage devices, in order to reduce data translation requests. (Exhibit 1).

<u>The issue of distance</u>

As to the need to allow for greater distances between hosts and storage devices, it was well known in the prior art that Fibre Channel offered the availability of a greater distance. U.S. Patent No. 5,519,695 to Purhoit, et al, starting at Column 2, Line 12 identified as prior art as of the filing date of October 27, 1994. (Exhibit 1).

<u>Addressability</u>

The '753 Patent identifies addressability in three different instances. First, as a map between the Fibre Channel controller and the SCSI controller. Second, as it relates to Fibre Channel devices and SCSI devices. Third, as access controls.

Mapping between the Fibre Channel controller and the SCSI controller

As to the first instance, mapping between a Fibre Channel controller and a SCSI controller was well-known in the art as evidenced by U.S. Patent No. 5,748,924 to Llorens, ėt al, filed October 17, 1995, issued May 5, 1998. Also, as identified above, the Patentees admitted that mapping was prior art. While the Llorens Patent was reviewed during the initial examination of the '035, '972, and '036 Patents, presenting it again in this context is permissible. "The existence of a substantial new question of Patentability is not precluded by the fact that a Patent or printed publication was previously cited by or to the Office or considered by the Office." 35 U.S.C. §303(a), which overruled a portion of the case of In re Portola on the issue of using art relied upon in the initial examination. See 2002 Amendments. Pub.L. 107-273, § 13105(a), inserted "The existence of a substantial new question of Patentability is not precluded by the fact that a Patent or printed publication was previously cited by or to the Office or considered by the Office." (Exhibit 1).

Addressability of Fibre Channel devices and SCSI devices

It was well-known in the prior art how to identify the existence of Fibre Channel devices and SCSI devices connected to a computer or on a network. See U.S. Patent No. 5,317,693 to Cuenod, et al., titled "Computer peripheral device network with peripheral address resetting capabilities" filed April 4, 1991, issued May 31, 1994. U.S. Patent No. 5,664,107 to Chatwani, et al, titled "Method for providing for automatic topology discovery in an ATM network or the like" filed June 7, 1995, issued September 2, 1997. U.S. Patent No. 4,827,411 to Arrowood, et al, titled "Method of maintaining a topology database" filed June 15, 1987, issued May 2, 1989. Again, as identified above, the Patentees admitted that Fibre-to-SCSI storage routers were prior art and these types of routers, as shown in figure 2 of the '753 Patent, had a number of workstations and storage units attached to the Fibre and SCSI channels. Such a situation could not have existed unless the devices on the channels were addressable. (Exhibit 1).

Access Controls

The *Haugdahl* article addressed access control as far back as 1984. Concerning access control, Fibre Channel was known to be, "a channel-network hybrid, containing enough network features to provide the needed connectivity, distance and protocol multiplexing, and enough channel features to retain simplicity, repeatable performance and reliable delivery." Arrowood Id. The Patentees admitted that one of the network's functions was the performance of access control.

Q. Okay. Can you explain your invention of the 972 Patent invention in your own words, sir?
A. The invention provides a method for connecting computers to storage devices, providing that connectivity, the ability to map storage between different devices, providing virtual local storage and security management capabilities for those devices.
Q. Well, what was the state-of-the-art at the time that you came up with your invention? How were people doing that sort of thing?
A. Primarily through the use of network servers.
(Trial transcript of Hoese. Page 58, starting at line 16.) See above.

Q. So how did your invention improve on this basic situation?
A. Well, using the invention in this role, you basically have the computers on the one side speaking their native low-level block protocols that they communicate with to storage devices, routing those through a storage router, and connecting those devices to the actual storage without having to do the translation from the – through the network protocols or translation through the file system.
(Trial transcript of Hoese. Page 60, starting at line 19.) See above.

Q. Mr. Russell, you said you solved problems that existed in the world just a moment ago. Could you elaborate on that, what you meant by that?
A. Sure. That was the initial problem that we saw to be solved by the invention which is the way that storage was hooked up remotely. So it was done through network file servers across the network, and that's how you accessed storage.
(Trial transcript of Russell. Page 115, starting at line 5.) (Exhibit 21).

By admission of both Patentees, a prior art network file server had the ability to perform all the functions identified by the invention, including restricting the addressability of the storage units, i.e. access control. What the networks did not do was operate using native low-level block protocols.

However, as shown above, it was well known in the art that transport mediums such as Fibre Channel and SCSI contained network capabilities and could work at low-level block protocols The ability to identify, address, and partition storage drives for access by a host computer was well-known in the art at the time of the filing of the '753 Patent. As already discussed, this was evidenced by prior art RAID controllers such as the GEN5, CRD 5500, Iceberg and Infortrend 3000. However, it was also evidenced by U.S. Patent No. 5,634,111 to Oeda, et al, filed March 1993, issued May 27, 1997, reference in the Abstract. See also U.S. Pat. No. 4,961,224 to Yung titled "Controlling access to network resources," filed March 6, 1989, issued October 2, 1990. Also, U.S. Patent No. 5,659,756 titled, "Method and system for providing access to logical partition information on a per resource basis," to Hefferon, et al, filed March 31, 1995 discloses a system that partitions a subset of main storage. (Exhibit 1).

Another form of access control is identified in U.S. Patent No. 6,073,218 titled, "Methods and apparatus for coordinating shared multiple raid controller access to common storage devices," to DeKoning, et al, filed December 26, 1996, that was prior art as of the Patent filing date, which states in the "BACKGROUND OF THE INVENTION" section that

> "There are five 'levels' of standard geometries defined in the Patterson publication. The simplest array, a RAID level 1 system, comprises one or more disks for storing data and an equal number of additional 'mirror' disks for storing copies of the information written to the data disks. The remaining RAID levels, identified as RAID level 2, 3, 4 and 5 systems, <u>segment the data into portions for storage across several data disks</u>. One or more additional disks are utilized to store error check or parity information."

Storage across disks addresses assigning <u>subsets of the disk</u> to retain information from a specific workstation. (emphasis added). (Exhibit 1).

The prior art identifies aspects of a distributed security system in which access to system resources is controlled by access control lists associated with each system resource. U.S. Patent No. 5,315,657 to Abadi, et al., issued: May 24, 1994, filed September 28, 1990. Access control lists are used to define the extent to which different users will be allowed access to different resources on a server depending on the level of access control implemented on a given server, access control lists for a given disk defines the access restrictions for all the resources or files stored on that disk. U.S. Pat. No. 5,889,952 to Hunnicutt, et al, issued March 30, 1999, filed: August 14, 1996 under the "STATEMENT OF THE PROBLEM" as part of prior art as of the filing date of August 14, 1996. Each host processor has exclusive access to its own set of storage devices and it cannot access the storage device of another host. U.S. Pat. No. 5,860,137 to Raz, et al, issued January 12, 1999, filed: July 21, 1995 under the "BACKGROUND OF THE INVENTION" As part of prior art as of the filing date of July 21, 1995. These groups of files form virtual disks, sometimes referred to as mini-disks, which for purposes of this description are identified by a number. A list of authorized users must exist for each mini-disk. U.S. Pat. No. 5,469,576 to Dauerer, et al, issued November 21, 1995, filed March 22, 1993. (Exhibit 1).

Given the Patentees sworn admission that a Fibre to SCSI storage router was well known in the art, it would have been obvious to a person skilled in the art to start with a router and implement changes to address the need for access controls within the router. This, in turn, would have led to the design of a device that incorporated all the limitations as found in the '753 Patent.

X. A PERSON OF ORDINARY SKILL IN THE ART AT THE TIME OF THE ALLEGED INVENTION WOULD BE MOTIVATED TO ADD ACCESS CONTROLS TO EXISTING STORAGE ROUTERS

A Person of Ordinary Skill in the Art at the Time of the Alleged Invention

The '753 Patent identifies the invention as a bridge device. '753 Patent Column 5 starting at Line 34. At the time the '972 and '753 Patents were filed, a person skilled in the art of the computer field would have knowledge of networks, server, routers, bridges, and brouters. Furthermore, such a person would be familiar with connecting workstations and storage devices with the items listed above. It is thus important to identify what encompasses a bridge and other related devices at the time of the filing of the '753 application.

"In general, routers are used to interconnect different configurations of LANs (Ethernet to token ring, for example), over arbitrary distances, while bridges are used to interconnect locally like configurations of LANs (token ring to token ring, for example)." U.S. Patent No. 5,426,637 to Derby, et al, filed December 14, 1992, issued June 20, 1995, (Emphasis added). (Exhibit 1).

> "A router is an internetworking device that chooses between multiple paths when sending data, particularly when the paths available span a multitude of types of local area and wide area interfaces. Routers are best used for (1) selecting the most efficient path between any two locations; (2) automatically re-routing around failures; (3) solving broadcast and security problems; and (4) establishing and administering organizational domains. One class of router, often called bridge/routers or Brouters, also implements switching functionality, such as transparent bridging and the like."

U.S. Patent No. 5,802,278 to Isfeld, et al, identified as prior art as of the date of filing the application, starting at Column 1 at Line 23, filed January 23, 1996, issued September 1, 1998, (Emphasis added). (Exhibit 1).

A brouter (bridge/router) is a device that connects two or more LANs. A brouter allows stations on one LAN to connect to stations on different LANs. U.S. Patent No. 5,781,715 to Sheu, identified in "Prior Art" as of the filing date starting at Column 1, Line 26, filed October 13, 1992, issued July 14, 1998, emphasis added. (Exhibit 1).

> "A previously known local area network (LAN) is used to interconnect multiple personal computers or work stations, called 'clients,' and a network server. The

network server comprises a personal computer and a program which provides a variety of services to the clients. For example, the server manages a local disk (DASD) and permits selected (or all) clients on the LAN to access the disk. Also, the server may provide access by LAN clients to a local printer that the server manages. To access the local disk, the client must first establish a session or 'log-on' to the server with a valid account and password and request a connection to the local disk. In response, the server validates the account and password, and grants the connection if available. Then, the client requests a remote file operation (e.g. open, read, write, close) and furnishes associated parameters. In response, the server may copy (depending on the operation) the file from the local disk into RAM, and performs the operation requested by the client. If the file is updated, the server will copy the updated version back to the local disk, overwriting the previous version."

U.S. Patent No. 5,642,515 to Jones, et al, titled "Network server for local and remote resources," filed April 17, 1992, issued June 24, 1997, in the background section identifying prior art, starting at Column 1 at Line 11, emphasis added. (Emphasis added). (Exhibit 1).

From the references above, it is clear that a person skilled in the art at the time of the filing of the '753 Patent application would understand the principles and applications of: 1) connecting a multiplicity of computing devices together, or to a system; 2) connecting a variety of peripherals to a system; 3) interfacing between like and different mediums; 4) controlling the access to storage units; 5) techniques for making a storage device transparent to a workstation (virtual local storage); and 6) a thorough understanding of similarities and differences in the various protocols in the computer field.

Motivation to add Access Controls to Existing Storage Routers

The central question in combining a variety of elements to arrive at the invention in a Patent is, "what would motivate a person to combine the elements?" In the present case, the Patentees have provided the answer to this question. Through sworn testimony, the Patentees identified a number of general problems in the field. The nature of the problem can lead inventors to look to references relating to possible solutions to that problem. In re Rinehart, 531 F.2d 1048, 1054, 189 USPQ 143, 149 (CCPA 1976).

As discussed above, inventor Hoese testified at trial that a storage router having every limitation of the alleged invention of the '972 and '753 Patents, except for access control, was prior art as identified in Fig. 2 of the '753 Patent and the related written description. Also, inventor Hoese stated that the alleged invention of the '753 Patent was just adding access control to a storage router. The Iceberg, GEN5, CRD-5500, and IFT 3000 prior art RAID controllers were all "routers" (as defined by the Court in the *Chaparral* case) that performed access controls. The designers of each of those controllers understood clearly the benefits of having those RAID controllers perform access controls, as opposed to a network server. The article written by *Haugdahl*, above, identifies that making volumes private by using passwords was a desirable feature for a network type system. Further, inventor Hoese identified that addressibility was a well-known issue in the field. Further, the article written by *Haugdahl,* and the patents to Oeda, Yeung, Hefferon, DeKonig, Abadi, Hunnicutt, Raz, and Dauerer all discuss not only the existence of well-known techniques for restricting access to storage devices in systems involving multiple hosts and multiple storage devices, but the need to do so.

Given the prior art storage router in Fig. 2 of the '753 Patent, the prior art RAID controllers discussed herein, the teaching from *Haugdahl* that it was desirable to include access control in systems like the storage router in Fig. 2, the Patentees testimony that addressibilty was an issue at the time of the alleged invention embodied in the '753 Patent, the numerous prior art patent references to access control, and the knowledge of those in the art regarding the use of access controls in storage systems, it would have been obvious to one skilled in the art at the time of the alleged invention of the '753 Patent to merely add access control to a prior art storage router and arrive at the '753 Patent.

XI. VALIDITY ANALYSIS: EXHIBITS CITING PRIOR ART AND EXPLAINING THE PERTINENCY AND MANNER OF

APPLYING THE CITED PRIOR ART

Due to the large quantity of prior art cited in this request for reexamination, we include appendices and exhibits to explain the pertinency and manner of applying the cited prior art in tabular form rather than to embed hundreds of pages of analysis within this request. Although the analysis in the appendices and exhibits refer directly only to a selected subset of the claims of the '753 Patent, all arguments for invalidity apply equally to the remaining claims of the '753 Patent.

Appendix A includes an analysis of the meaning of terms used in Claim 1 of the '753 Patent, based upon the *Chaparral Markman* order, the patentee's admissions, and the prior art.

Appendix B includes a matrix summarizing and identifying the elements of Claim 4 of the '753 Patent that are found in each of the cited prior art U.S. Patents and printed publications.

Appendix C includes a listing of possible prior art combinations in support of an obviousness rejection claims of the '753 Patent under 35 U.S.C. §103.

Exhibit 22 includes charts for each of the U.S. Patents and printed publications identified in Appendix B, indicating the relevant portions of the prior art that pertain to elements of the '753 Patent claims.

Below, please find the detailed analysis of each of the eight (8) claims of the '753 Patent and summary of the prior art and combinations that render each claim invalid.

Claim 1.

Claim 1 states:

> 1. A data storage gateway capable of interfacing with and providing connectivity and mapping between a Fiber Channel and SCSI channel interface, the data storage gateway comprising:
> a virtual storage;
> a storage router in communication with and providing mapping to the virtual storage such that a fiber channel device remote

from the virtual storage can communicate data to and from the virtual storage; and

wherein the storage router is capable of configuring a SCSI device to contain at least a portion of the virtual storage.

The '753 Patent breaks the pattern followed by the patentees in the other Related Patents which was to gradually broaden claims from the '972 Patent, to the '036, to the '035, and then to the '854 Patent. Those other four patents show a progression where, in essence, words of limitation are removed from selected portions of the claims. For further discussion of the differences between claims in these patents, see Exhibit 4 (differences in claims of the '972, '036, '035 and '854 Patents). The '753 Patent is slightly different, and the claims are analyzed, below.

<u>Claim 1 is Invalid Based on RAID Controllers in the Prior Art that Already Have Access Controls</u>

Claim 1 of the '753 Patent describes a "data storage gateway." This phrase does not appear anywhere in the '753 specification, and the definition is not entirely clear, but it seems to describe simply a router. Instead of specifying a limitation for the router's performing "access control" (as is found in Claim 1 of the '972, '036, '035 and '0854 Patents), Claim 1 of the '753 Patent includes limitations for "virtual storage." Therefore, it appears that Claim 1 of the '753 Patent describes only a router that connects to devices on the host side through the Fibre Channel transport medium, and to storage devices on the other side through the SCSI transport medium, which allows for the host to access the storage devices as if the storage devices are "local" - directly connected to the host, or internal to the host.

As discussed above, the patentees admitted that Fig. 2 was prior art. Figure 2 shows exactly what is claimed in Claim 1 of the '753 Patent, which is a "storage router" mapping between Fibre Channel workstations and SCSI disk. Such a storage router is also clearly described in the manuals for the Maxstrat Gen5, [See Exhibit 10, Claim chart, and Exhibits 11 and 12, Gen5 manuals], CRD-5500 and the IFT-3000 manuals.

The patentees have admitted that the only component of the alleged invention of the '972 Patent and '753 Patent that they believe to be innovative is the performance of "access control" using "low level, block protocols" in the router device. Claim 1 of the '753 Patent does not specifically identify access control, but it does cover the function of access control in the limitations for "virtual storage" and for a storage router "... capable of configuring a SCSI device to contain at least a portion of the virtual storage". If Claim 1 does not require the limitation of access controls using low level, block protocols, then by the patentee's own admissions, Claim 1 describes prior art.

However, if Claim 1 does require the limitation of access controls - as discussed above and demonstrated in Exhibits 10 and 11 - the Maxstrat Gen5 router device implements access controls using low level, block protocols. As the Gen5 manuals show, access control was configured for the Gen5 by using the "ifp" command which includes the "luns bitmask enable" field. This field is used to specify the enabling of LUNs on interface ports to provide access to "facilities" (storage units). [See Exhibit 10, Claim chart, pages 5 and 6; see Exhibit 11, Gen5 System Guide, pages 4-42 to 4-43]. The same is true for the CRD-5500, IFT-3000 and Iceberg RAID controller/router devices.

The Court in the *Chaparral* case defined "implements access controls for storage space on the SCSI storage devices" as "provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage device." (Exhibit 6, starting on page 3; Exhibit 6, page 15). The Gen5 did exactly that - a simple and reasonable configuration of the Gen5 would result in some computers having access to specific RAID sets (which could be a subset of storage devices or sections of a single storage device), while other computers would not have access to those specific storage units.

The CRD-5500 had a similar access control called "Host LUN Mapping." The CRD-5500 Host LUN Mapping feature made it possible to map RAID sets differently to each host. (Exhibit 14, CRD-5500 User's Guide, pages 1-1 and 4-5). The IFT-3000 also had a similar feature for mapping LUNs to logical drives (Exhibit 15 Claim chart). The only element of the '972 Patent missing from the CRD-5500 or IFT-3000 is the use of the Fibre Channel transport medium to communicate with hosts, which is admitted by the patentees to be part of the prior art described in Figure 2.

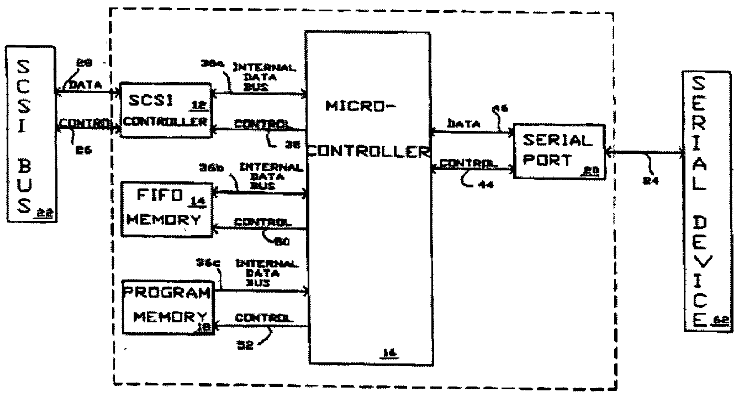
Thus, the Maxstrat Gen5 anticipates Claim 1 under 35 U.S.C. §102, and the CRD-5500 and IFT-3000, in light of the admitted prior art of Figure 2, render Claim 1 obvious under 35 U.S.C. §103.

Claim 1 is Also Invalid Based on Adding Access Controls to U.S. Patents in the Prior Art

The RAID controllers discussed above anticipate and render the '753 Patent obvious because they include elements for "access control," as that term is used in the '753 Patent. The alleged invention of the '753 Patent can also be arrived at by starting with prior art U.S. Patents for storage routers and adding access controls. A listing of such prior art appears in Exhibits 1 and 22 and in Appendices B and C.

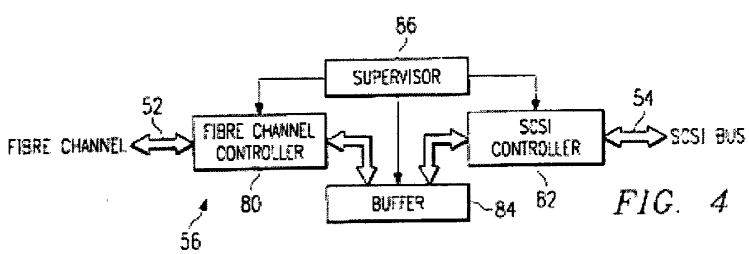
For example, U.S. Patent No. 5,748,924 (the '924 Patent) to Llorens, et al, filed October 17, 1995, issued May 5, 1998 is pertinent to discuss here, and a good reference to use for defining one such physical structure. As discussed above, 35 U.S.C. §303(a) authorizes the Patent Office to consider the Llorens prior art in a reexamination, even though this U.S. Patent was cited during the initial examination of the '753 Patent. The structure of Claim 1 in the '753 Patent is virtually identical to Fig. 1 of the '924 Patent shown below. (Exhibit 1).

'924 Patent to Llorens, Fig. 1



This figure identifies the same elements of the storage router depicted in Fig. 4 of the '753 Patent, such as a SCSI bus, Serial Device (Fibre Channel), and a memory (buffer). Even though a Fibre Channel controller is not explicitly shown in this figure, the written description makes it clear that the microprocessor and FIFO operate in conjunction to convert the parallel SCSI data into a serial format. Fibre Channel is a serial format, and the summary of the invention specifically references Fibre Channel as a serial format for use with the invention.

Below is Fig. 4 of the '753 Patent.



The comparison between these two figures is striking. While Fig. 4 of the '753 Patent identifies data passing between the controllers and the buffer, it is important to note that this limitation is not present in the claims of the '753 patent. This renders the functionality described by the two images to be nearly identical.

The '924 Patent was referenced as prior art in the '753 Patent application by the Patentees. This shows that a person skilled in the art at the time, such as the Patentees, would have known that the '924 was a relevant and useful foundation from which to solve the problems identified supra by the Patentees.

The '924 Patent addresses an adapter for facilitating communications between a Fibre Channel device and a SCSI device. This was also well known as described above in reference to the patents issued to Chatwani and Arrowood. The '924 structure allows for Fibre Channel to SCSI interfacing using native low-level block protocols, as discussed above. The use of low-level block protocols was also known in the prior art as shown in the patents issued to Malladi and Berman, shown above and addressed the known issue of reducing data translation requests. Further, the patentees admitted that Figure 2 of the '753 Patent (showing a Fibre Channel to SCSI storage router) was prior art.

While the '924 Patent addresses a single device on each side of the adapter, the principal could be expanded to a number of such devices. This is true where, as here, part of the statement of the problem in the field as sworn to by the inventor of the '753 Patent addressed multiple devices. This would include multiple Fibre Channel devices cooperating with multiple SCSI storage units.

At the time of the '972 and '753 Patent Applications, a person skilled in the art trying to solve the problem of addressability of devices (as identified by the patentees) would certainly have relied upon disclosures in the prior art referring to access control from such sources as the patents issued to Oeda, Yung, Hefferon, DeKoning, Abadi, Hunnicutt, Raz, and Dauerer discussed above. Access control could be combined with transparent bridging between Fibre Channel devices and SCSI devices, which was well known in the art. See U.S. Patent No. 5,802,278 to Isfeld, et al, above. This combination provides virtual local storage as defined in the '753 Patent. (Exhibit 1).

Access control is not limited to any single embodiment. As identified in the written description of the '753 Patent, "Storage router 56 allows the configuration and modification of the storage allocated to each attached workstation 58 through the use of mapping tables or other mapping techniques." '753 Patent, starting at Column 4, Line 13. The claims of the '753 Patent cover any mapping techniques, and not just tables or lists. As such, a person skilled in the art would have known of the numerous ways described above to achieve access control.

When viewing the teachings of the *Haugdahl* and *Bursky* articles, the Patentees sworn statements concerning issues that drove the field at the time of the alleged invention of the '753 Patent, and the numerous prior art references, it becomes clear that a person skilled in the art would have know to combine the references cited above and arrive at the '753 alleged invention.

Claim 2

Claim 2 depends from claim 1 and states:

> 2. The data storage gateway according to claim 1, further including a memory work space for the storage router using a buffer.

Claim 2 merely adds the limitation of a memory work space using a buffer. As discussed earlier, the manuals for the Maxstrat Gen5, CRD-5500 and IFT-3000, along with numerous U.S. Patents and printed publications, described a buffer as described before the alleged invention of the '753 Patent. Thus, this claim merely describes features found in the prior art.

Claim 3.

Claim 3 depends from claim 2 and states:

3. The data storage gateway according to claim 2 wherein a Fibre Channel transport medium connects to the storage router and interfaces with a Fibre Channel controller and wherein a SCSI bus transport medium connects to the storage router and interfaces with a SCSI controller.

A Fibre Channel controller/transport medium and a SCSI controller/transport medium connected to the router (gateway) are exactly what was identified by Figure 2 of the '753 Patent, which was admitted by the patentees to be prior art. Thus, this claim merely describes features found in the prior art.

Claim 4.

Claim 4 is a method claim and states:

4. A method for providing, through a storage router, virtual local storage on remote SCSI storage devices to Fibre Channel devices, comprising:

interfacing with a Fibre Channel transport medium;

interfacing with a SCSI bus transport medium;

maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices; and

allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration.

Claim 4 merely describes the operation of a storage router as identified supra as prior art. Not only were the physical elements identified in Claim 4 known in the prior art, but each of the concepts including access control were known. As demonstrated, the combination of these elements and functions was anticipated and obvious in light of the prior art and the aforementioned motivations to combine.

Claim 5.

Claim 5 depends from claim 4 and states:

> 5. The method of claim 4, further comprising the step of providing memory work space for the storage router using a buffer.

As discussed above, prior routers such as the Gen5, CRD-5500 and IFT-3000 utilized a memory buffer providing work space for the storage router. Claim 5 merely provides further definition for a storage router including a prior-art buffer.

Claim 6.

Claim 6 depends from claim 5 and states:

> 6. The method of claim 5, wherein the Fibre Channel transport medium connects to and interfaces with a Fibre Channel controller and wherein said SCSI bus transport medium connects to and interfaces with a SCSI controller.

As shown in prior art Figure 2, a Fibre Channel transport medium connected to a Fibre Channel controller and a SCSI bus transport medium connected to a SCSI controller was already well known in the art and used with storage routers. Claim 6 adds nothing novel.

Claim 7.

Claim 7 depends from claim 5 and states:

> 7. The method of claim 5, wherein the maintaining step and the allowing step are performed by a supervisor unit.

As discussed above, the Maxstrat Gen5, CRD-5500 and IFT-3000 all included a microprocessor used as a supervisor unit. Thus, Claim 7 adds nothing novel to the prior art.

Claim 8.

Claim 8 depends from claim 7 and states:

8. The method of claim 7, wherein the supervisor unit is coupled to the Fibre Channel controller, the SCSI controller, and the buffer.

As discussed above, the Maxstrat Gen5 included a microprocessor (supervisor unit) connected to the Fibre Channel controller, the SCSI controller, and the buffer. Thus, Claim 8 adds nothing novel to the prior art.

As has been shown and amply demonstrated by the Maxstrat Gen5 manuals, all claims of the '753 Patent are anticipated under 35 U.S.C. §102 by printed publications. In addition, as demonstrated by the CRD-5500 manuals, IFT-3000 manuals, and numerous cited publications and U.S. Patents, all claims of the '753 Patent are also rendered obvious under 35 U.S.C. §103 by printed publications.

XII. THERE ARE NO SECONDARY CONSIDERATIONS THAT WOULD INDICATE THAT THE ALLEGED INVENTION WS NOT OBVIOUS

Secondary considerations for nonobviousness can include evidence of commercial success, long felt but unsolved needs, and failure of others. Graham v. John Deere Co., 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966). As discussed above, there were no long felt but unsolved needs that the alleged invention addressed. Furthermore, there is no indication that others attempted and failed to arrive at the alleged invention.

As to commercial success, there must be a sufficient relationship, or "nexus", between the commercial success and the patented invention. Demaco Corp. v. F. Von Langsdorff Licensing Ltd., 851 F.2d 1387, 1392 (C.A.Fed.1988). "The term 'nexus' is often used, in this context, to designate a legally and factually sufficient connection between the proven success and the patented invention, such that the objective evidence should be considered in the determination of nonobviousness." Id at 1392. The burden of proof as to this connection or nexus resides with the Patentee. Id.

There is no evidence that the '753 Patent has been licensed or that any income of any kind has been gained from the '753 Patent. The Inventors have never made a router product that performs access controls, as described in the '753 Patent; in fact, they have never even written any software that can perform access controls. There is no indication of secondary considerations.

XIII. IN CONCLUSION, THE '753 PATENT IS INVALID AS BEING ANTICIPATED BY THE MAXSTRAT GEN5 AND AS BEING OBVIOUS IN LIGHT OF THE NUMEROUS MOTIVATIONS TO COMBINE AND THE VAST PRIOR ART

The Maxstrat GEN5 satisfies every limitation that exists in the claims of the '753 Patent. Thus, the GEN5 anticipates the '753 Patent and therefore the '753 Patent is invalid. But for adding the Fibre Channel transport medium as a means of connecting hosts to a router device, the CRD-5500, IFT-3000 and Iceberg (as well as the DEC HSZ70) also anticipate the '753 Patent; the use of the Fibre Channel transport medium to connect hosts to a router device would have been obvious to one skilled in the art at the time of the '753 Patent.

The patentees have admitted under oath that the only inventive aspect of the '972 and '753 Patents was the movement of the "access controls" function from the network server into the router device. However, the combining of a storage router and access control and thereby arriving at the alleged invention of the '753 Patent would have been obvious to one skilled in the art based on the numerous motivations to combine and the prior art references.

The motivation to combine elements in the field to arrive at a storage router with a Fibre-to-SCSI configuration that performs access controls is evident from the Patentees' sworn testimony as to the general needs known in the art at the time of the invention and the numerous suggestions and teachings found in the *Haugdahl* article and other prior art.

As to the question of obviousness, the existence of differences between prior art and the invention is not determinative. "But the mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness. The gap between the prior art and respondent's system is simply not so great as to render the system nonobvious to one reasonably skilled in the art." Dann v. Johnston 425 U.S. 219, 230, 96 S.Ct. 1393, 1399 (U.S.Cust. & Pat.App.,1976)(a computer system case). In the present case, the gap is nonexistent due to the nature of the prior art and the clear motivation to combine. The '753 Patent is invalid as being anticipated and obvious.

Appendix and Exhibit List for '753 Reexamination

Following is a description of the appendices and exhibits included herein.

Appendix A	Analysis of the meaning of claim terms of '753 Patent
Appendix B	Matrix of claim elements of '753 Patent found in prior art
Appendix C	Listing of possible prior art combinations showing obviousness

Exhibit 1	Copies of patents and printed publications relied upon	
Exhibit 2	Patent at issue (6,421,753)	
Exhibit 3	Certification of service	
Exhibit 4	Differences between claims of '972, '036, '035 and '854 Patents	
Exhibit 5	Motion for Summary Judgment, *Crossroads v. Dot Hill*	
	MSJ Exhibits 3, 4 & 5	Declarations of DEC HSZ70 inventor & witnesses
	MSJ Exhibits 6, 7 & 8	DEC HSZ70 Manuals
	MSJ Exhibit 11	DEC HSZ70 Software excerpt
	MSJ Exhibit 15	Chart comparing DEC HSZ70 with claims of '035 Patent
Exhibit 6	Markman Order, *Crossroads v. Chaparral*	
Exhibit 7	*Marlow* case	
Exhibit 8	*McGaughey* case	
Exhibit 9	Trial transcript of Hoese, *Crossroads v. Chaparral*	
Exhibit 10	Chart comparing Gen5 with claims of '753 Patent	
Exhibit 11	Gen5 System Guide	
Exhibit 12	Gen5 GUI User's Guide	
Exhibit 13	Declaration that Gen5 configuration was available	
Exhibit 14	CRD-5500 User's Manual	
Exhibit 15	Chart comparing IFT-3000 with claims of '753 Patent	
Exhibit 16	IFT-3000 Instruction Manual	
Exhibit 17	*Flasck* case	
Exhibit 18	*Haugdahl* article	
Exhibit 19	*Bursky* article	
Exhibit 20	Deposition of Hoese, *Crossroads v. Chaparral*	
Exhibit 21	Trial transcript of Russell, *Crossroads v. Chaparral*	
Exhibit 22	Charts comparing prior art with claims of '753 Patent	

We respectfully request that reexamination of U.S. Patent No. 6,421,753 be undertaken based upon the substantial new question of Patentability raised herein.

July 19, 2004

Respectfully submitted,
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Enclosures:

- Transmittal Form PTO/SB/57
- Appendices A, B and C
- Exhibits 1 through 22
- Check for $2,520.00, Check no.: 3406

I hereby certify that this is being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated below and is addressed to: Mail Stop Ex Parte Reexam, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on July 19, 2004. Express Mail Label Nos.: **EO 904 389 617 US (box 1) and EO 904 389 705 US (box 2)**.

Dated: July 19, 2004 Signed
Print Name: Larry E. Severin

APPENDICES

- **APPENDIX A**
- **APPENDIX B**
- **APPENDIX C**

APPENDIX A

6,421,753 Patent	Definition of limitation	Prior Art
What is claimed is: 1. A data storage gateway capable of interfacing with and providing connectivity and mapping between a Fiber Channel and SCSI channel interface, the data storage gateway comprising:	A "data storage gateway" is not defined, identified, or referenced in the specification of the '753 Patent.	
a virtual storage; a storage router in communication with and providing mapping to the virtual storage such that a fiber channel device remote from the virtual storage can communicate data to and from the virtual storage; and wherein the storage router is capable of configuring a SCSI device to contain at least a portion of the virtual storage.	"Storage router". A device which provides virtual local storage, maps, implements access controls, and allows access using native low level block protocols, and which forwards data from devices (such as a personal computer) connected on one side of the router, through the router, to storage devices connected on the other side of the storage router. Chaparral Markman Order	"Virtual Storage" and "Storage router" Admission by Patentee. Trial transcript of Hoese. Page 81, starting at line 3. Q. Figure – well, figure 2 is not your invention, right, sir? A. Figure 2 is not my invention. Q. And this description is in reference to figure 2, and this description mentions native low-level block protocols and mentions mapping, and you say figure 2 is not your invention? A. That's correct. By admission of the Patentee, virtual storage, mapping and low-level block protocol are not the Patentee's invention. They are, by admission, part of the prior art. "Access control" The specification discloses aspects of a distributed security system in which access to system resources is controlled by access control lists

			associated with each system resource. U.S. Patent No. 5,315,657 to Abadi, et al. Issued: May 24, 1994 Filed: September 28, 1990 Access control lists are used to define the extent to which different users will be allowed access to different resources on a server...... Depending on the level of access control implementd on a given server, access control lists for a given disk defines the access restrictions for all the resources or files stored on that disk. U.S. Pat. No. 5,889,952 To Hunnicutt, et al Issued: March 30, 1999 Filed: August 14, 1996 Under the "STATEMENT OF THE PROBLEM" as part of prior art as of the filing date of August 14, 1996. Each host processor has exclusive access to its own set of storage devices and it cannot access the storage device of another host. U.S. Pat. No. 5,860,137 To Raz, et al Issued: January 12, 1999 Filed: July 21, 1995 Under the "BACKGROUND OF THE INVENTION" As part of prior art as of the filing date of July 21, 1995 These groups of files from virtual disks, sometimes referred to as mini-disks, which for purposes of this description are identified by a number. A list of authorized users must exist for each mini-disk. U.S. Pat. No. 5,496,576 To Dauerer, et al

		Issued: November 21, 1995 Filed: March 22, 1993 "Virtual local storage" Admission by Patentee. Trial transcript of Hoese. Page 81, starting at line 3. Q. Figure – well, figure 2 is not your invention, right, sir? A. Figure 2 is not my invention. In regards to Fig. 2, "A storage router 44 then serves to interconnect these mediums and provide devices on either medium global, transparent access to devices on the other medium." '753 Patent, Col. 3 starting at line 38.
	"Virtual local storage". A specific subset of overall data, stored in storage devices that are indirectly connected to and capable of physical separation from the devices connected to the first transport medium, which has the appearance and characteristics of storage on a device directly connected or contained within the workstation. Chaparral Markman Order.	By admission of the Patentee, transparent access to devices is in the prior art. "Virtual local storage" Admission by Patentee. Trial transcript of Hoese. Page 81, starting at line 3. Q. Figure – well, figure 2 is not your invention, right, sir? B. Figure 2 is not my invention. In regards to Fig. 2, "A storage router 44 then serves to interconnect these mediums and provide devices on either medium global, transparent access to devices on the other

				medium." '753 Patent, Col. 3 starting at line 38. By admission of the Patentee, transparent access to devices is in the prior art. "Access control" The specification discloses aspects of a distributed security system in which access to system resources is controlled by access control lists associated with each system resource. U.S. Patent No. 5,315,657 to Abadi, et al. Issued: May 24, 1994 Filed: September 28, 1990 Access control lists are used to define the extent to which different users will be allowed access to different resources on a server...... Depending on the level of access control implemented on a given server, access control lists for a given disk defines the access restrictions for all the resources or files stored on that disk. U.S. Pat. No. 5,889,952 To Hunnicutt, et al Issued: March 30, 1999 Filed: August 14, 1996 Under the "STATEMENT OF THE PROBLEM" as part of prior art as of the filing date of August 14, 1996. Each host processor has exclusive access to its own set of storage devices and it cannot access the storage device of another host. U.S. Pat. No. 5,860,137 To Raz, et al Issued: January 12, 1999 Filed: July 21, 1995

				Under the "BACKGROUND OF THE INVENTION" As part of prior art as of the filing date of July 21, 1995 These groups of files from virtual disks, sometimes referred to as mini-disks, which for purposes of this description are identified by a number. A list of authorized users must exist for each mini-disk. U.S. Pat. No. 5,496,576 To Dauerer, et al Issued: November 21, 1995 Filed: March 22, 1993 "Remote" Admission by Patentee. Trial transcript of Hoese. Page 81, starting at line 3. Q. Figure – well, figure 2 is not your invention, right, sir? C. Figure 2 is not my invention. Fig. 2 shows indirectly connected and separate storage devices. "Storage devices" Admission by Patentee. Trial transcript of Hoese. Page 81, starting at line 3. Q. Figure – well, figure 2 is not your invention, right, sir? D. Figure 2 is not my invention. Fig. 2 shows storage devices.

	"Mapping"To create a path from a device on one side of the storage router to a device on the other side of the router, i.e. from a Fibre Channel device to a SCSI device (or vice-versa). A "map" contains a representation of devices on each side of the storage router, so that when a device on one side of the storage router wants to communicate with a device on the other side of the storage router, storage router can connect the devices. Chaparral Markman Order.	Admission by Patentee.Trial transcript of Hoese. Page 81, starting at line 3. Q. Figure – well, figure 2 is not your invention, right, sir? A. Figure 2 is not my invention. Q. And this description is in reference to figure 2, and this description mentions native low-level block protocols and mentions mapping, and you say figure 2 is not your invention? A. That's correct. By admission of the Patentee, mapping is not part of the invention and is part of the prior art.As to a map, "Storage router 44 uses tables to map devices from one medium to the other and distributes requests and data across Fiber Channel 32 and SCSI bus 34 without any security access controls." '753 Patent, Col. 3 starting at line 56. U.S. Patent No. 5,748,924 to Llorens , et al, filed October 17, 1995, issued May 5, 1998.
	The phrase "implements access controls for storage space on the SCSI storage devices" means provides controls which limit a computer's access to a specific subset of storage devices or sections of a single storage devices.Chaparral Markman Order.	"Access control"The specification discloses aspects of a distributed security system in which access to system resources is controlled by access control lists associated with each system resource.U.S. Patent No. 5,315,657 to Abadi, et al.Issued: May 24, 1994Filed: September 28, 1990Access control lists are used to define the extent to which different users will be allowed access to different resources on a server……

				Depending on the level of access control implementd on a given server, access control lists for a given disk defines the access restrictions for all the resources or files stored on that disk.U.S. Pat. No. 5,889,952To Hunnicutt, et alIssued: March 30, 1999Filed: August 14, 1996Under the “STATEMENT OF THE PROBLEM” as part of prior art as of the filing date of August 14, 1996.Each host processor has exclusive access to its own set of storage devices and it cannot access the storage device of another host.U.S. Pat. No. 5,860,137To Raz, et alIssued: January 12, 1999Filed: July 21, 1995Under the “BACKGROUND OF THE INVENTION”As part of prior art as of the filing date of July 21, 1995These groups of files from virtual disks, sometimes referred to as mini-disks, which for purposes of this description are identified by a number. A list of authorized users must exist for each mini-disk.U.S. Pat. No. 5,496,576To Dauerer, et alIssued: November 21, 1995Filed: March 22, 1993

APPENDIX B

Infortrend 103 Obviousness Claim Comparison Chart for Patent No. '753

Independent Claim 4 Elements

	Buffer	Fibre Controller	SCSI Controller	Supervisor Unit	Map	Access Control	Low Protocols
High Performance							
FCS/ATM							
FC Storage							
Implementing FC							
New Serial I/Os							
SCSI Apps							
6,219,771							
6,185,203							
6,108,684							
6,081,849							
6,073,218							
6,055,603							
5,959,994							
5,935,260							
5,933,824							
5,848,251							
5,835,496							
5,812,754							
5,809,328							
5,805,816							
5,768,623							
5,748,924							
5,727,218							
5,634,111							
5,632,012							
5,621,902							
5,613,082							
5,581,724							
5,581,709							
5,568,648							
5,564,019							
5,548,791							
5,544,313							
5,537,585							
5,519,695							
5,511,169							
5,507,032							
5,495,474							
5,491,812							
5,471,609							
5,469,576							
5,459,857							
5,430,855							
5,423,026							
5,420,988							
5,416,915							
5,410,697							
5,410,667							
5,403,639							
5,396,596							
5,388,246							
5,388,243							
5,379,398							
5,379,385							
5,367,646							
5,361,347							
5,331,673							
5,301,290							
5,297,262							
5,247,638							
5,239,654							
5,226,143							
5,214,778							
5,212,785							
5,210,866							
5,202,856							
5,193,184							
5,193,168							
5,185,876							
5,155,845							
5,124,987							
5,077,736							
5,077,732							
4,897,874							
4,835,674							
4,825,406							
4,821,179							
4,811,278							
4,807,180							
4,787,028							
4,697,232							
4,533,996							
4,504,927							
4,455,605							

APPENDIX C

Combinations of Prior Art
Forming a Basis for Rejection under 35 U.S.C. §103 for
Claim 1 of U.S. Patent No. 6,421,753

The chart following in the next pages shows how U.S. patents and other printed publications may be combined to form a basis for rejection of U.S. Patent No. 6,421,753 ("the '753 Patent") under 35 U.S.C. §103.

All U.S. patents listed here were filed before the filing date of the '753, which is December 31, 1997. All printed publications listed here that are not U.S. patents were published before the subject matter disclosed in the '753 Patent was invented, and thus are available as prior art under 35 U.S.C. §102(a). Some of these U.S. patents and printed publications were published more than one year before the '753 Patent was filed, and thus are also available as prior art under 35 U.S.C. §102(b).

Each primary prior art reference is listed in the chart as "Primary Reference," followed on the same line by a code listed as "Claim Elements" describing which claim elements are present in that primary prior art reference. For each primary prior art reference, a list of secondary prior art references are listed as "Secondary References" with an accompanying "Claim Elements" code describing which claim elements are present in that secondary prior art reference. When the primary art reference is combined with any one of the secondary prior art references, all elements of Claim 1 are met so as to support invalidation of Claim 1 of the '753 Patent under 35 U.S.C. §103.

Here are the claim element codes, a short paraphrased description in parentheses, and the corresponding portions of independent Claim 4 and dependent Claims 5, 6, 7 and 8 of the '753 Patent:

-	"4. A method for providing, through a storage router, virtual local storage on remote SCSI storage devices to Fibre Channel devices, comprising:"
A	**(Buffer)** "5. The method of claim 4, further comprising the step of providing memory work space for the storage router using a buffer."
B	**(Fibre Channel Controller)** "(4. continued) interfacing with a Fibre Channel transport medium; 6. The method of claim 5, wherein the Fibre Channel transport medium connects to and interfaces with a Fibre Channel controller"
C	**(SCSI Controller)** "(4. continued) interfacing with a SCSI bus transport medium; (6. continued) and wherein said SCSI bus transport medium connects to and interfaces with a SCSI controller."

D	**(Supervisor Unit)** "7. The method of claim 5, wherein the maintaining step and the allowing step are performed by a supervisor unit. 8. The method of claim 7, wherein the supervisor unit is coupled to the Fibre Channel controller, the SCSI controller, and the buffer."
E	**(Map)** "(4. continued) maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices"
F	**(Access Control)** "(4. continued) and that implements access controls for storage space on the SCSI storage devices; and"
-	-
G	**(Low Protocols)** "(4. continued) allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration."

This breakdown of elements is the same as that used in the analysis of Claims 4 through 8 in Appendix B and Exhibit 22, where the specific portions of the prior art references are related to elements of claims of the '753 Patent. The preamble to Claim 1 does not have a claim element code, because the preamble is not a limitation.

For example, Appendix B shows that U.S. Patent No. 6,219,771 has elements A, B, C, D, E, and G, but possibly not element F. The section of the detailed matrix in Exhibit 22 for U.S. Patent No. 6,219,771 includes specific references that meet many elements of Claim 1 of the '753 Patent, but no reference is listed for claim element F for Access Control. This means that U.S. Patent No. 6,219,771 may be combined with another prior art reference that includes a description of Access Control to support a 35 U.S.C. §103 rejection. Therefore, in the chart in this Exhibit, the Primary Reference entry for U.S. Patent No. 6,219,771 is followed by claim element codes ABCDEG. Listed below this primary reference is a list of several secondary prior art references that all include at least claim element F, so that any of these secondary pieces of prior art can be combined with U.S. Patent No. 6,219,771 to describe all the elements of Claim 1 and thereby render Claim 1 of the '753 Patent obvious.

6,421,753 Obviousness Combinations (need ABCDEFG)

Primary Reference:* *SCSI applications on Fibre *Claim Elements:* *ABCEG*

Secondary References	Claim Elements
High-Performance Data ...	DEFG
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG
5,634,111	ACDEF
5,613,082	ADEF
5,379,398	ADEF

Primary Reference:* *New Serial I/Os Speed ... *Claim Elements:* *BCE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG

Primary Reference:* *Implementing a Fibre ... *Claim Elements:* *AEG*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference:* *High-Performance Data ... *Claim Elements:* *DEFG*

Secondary References	Claim Elements
SCSI applications on Fibre...	ABCEG
Fibre channel storage ...	ABCDFG
6,219,771	ABCDEG
6,055,603	ABCFG
5,935,260	ABCG
5,459,857	ABCE
5,396,596	ABCDG

Primary Reference:* *Fibre channel storage ... *Claim Elements:* *ABCDFG*

Secondary References	Claim Elements
SCSI applications on Fibre...	ABCEG

New Serial I/Os Speed …	BCE
Implementing a Fibre …	AEG
High-Performance Data …	DEFG
Fiber Channel (FCS)/ATM …	ABDEG
6,219,771	ABCDEG
6,185,203	ABDE
5,959,994	AEG
5,809,328	ABDEG
5,805,816	AEF
5,768,623	E
5,727,218	ABDEG
5,634,111	ACDEF
5,632,012	AE
5,621,902	ADEG
5,613,082	ADEF
5,581,724	AEG
5,581,709	ADE
5,568,648	E
5,548,791	AE
5,544,313	E
5,537,585	E
5,519,695	ABEG
5,511,169	DE
5,507,032	E
5,471,609	E
5,459,857	ABCE
5,430,855	AE
5,423,026	E
5,420,988	EG
5,416,915	AE
5,410,697	AE

5,410,667	AE
5,403,639	AEFG
5,379,398	ADEF
5,379,385	AEG
5,367,646	AE
5,361,347	AEF
5,301,290	AE
5,297,262	ADEG
5,247,638	AEG
5,226,143	AE
5,214,778	ADE
5,210,866	AEG
5,193,184	AEFG
5,193,168	DE
5,155,845	AEG
5,124,987	AEG
5,077,736	ADEG
4,897,874	AEFG
4,807,180	AE
4,787,028	AE
4,697,232	AE
4,455,605	E

Primary Reference: Fiber Channel (FCS)/ATM *Claim Elements: ABDEG*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG
5,634,111	ACDEF

Primary Reference: 6,219,771 *Claim Elements: ABCDEG*

Secondary References	Claim Elements
High-Performance Data …	DEFG

Fibre channel storage ...	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG
5,812,754	ABF
5,805,816	AEF
5,634,111	ACDEF
5,613,082	ADEF
5,564,019	F
5,469,576	F
5,403,639	AEFG
5,379,398	ADEF
5,361,347	AEF
5,193,184	AEFG
4,897,874	AEFG

Primary Reference: 6,185,203 *Claim Elements: ABDE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG

Primary Reference: 6,055,603 *Claim Elements: ABCFG*

Secondary References	Claim Elements
High-Performance Data ...	DEFG
Fiber Channel (FCS)/ATM ...	ABDEG
6,219,771	ABCDEG
6,185,203	ABDE
5,809,328	ABDEG
5,727,218	ABDEG
5,634,111	ACDEF
5,621,902	ADEG
5,613,082	ADEF
5,581,709	ADE

5,511,169	DE
5,379,398	ADEF
5,297,262	ADEG
5,214,778	ADE
5,193,168	DE
5,077,736	ADEG

Primary Reference: 5,959,994 *Claim Elements: AEG*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,935,260 *Claim Elements: ABCG*

Secondary References	Claim Elements
High-Performance Data ...	DEFG
5,634,111	ACDEF
5,613,082	ADEF
5,379,398	ADEF

Primary Reference: 5,848,251 *Claim Elements: BCDFG*

Secondary References	Claim Elements
SCSI applications on Fibre...	ABCEG
Implementing a Fibre ...	AEG
Fiber Channel (FCS)/ATM ...	ABDEG
6,219,771	ABCDEG
6,185,203	ABDE
5,959,994	AEG
5,809,328	ABDEG
5,805,816	AEF
5,727,218	ABDEG
5,634,111	ACDEF
5,632,012	AE
5,621,902	ADEG

5,613,082	ADEF
5,581,724	AEG
5,581,709	ADE
5,548,791	AE
5,519,695	ABEG
5,459,857	ABCE
5,430,855	AE
5,416,915	AE
5,410,697	AE
5,410,667	AE
5,403,639	AEFG
5,379,398	ADEF
5,379,385	AEG
5,367,646	AE
5,361,347	AEF
5,301,290	AE
5,297,262	ADEG
5,247,638	AEG
5,226,143	AE
5,214,778	ADE
5,210,866	AEG
5,193,184	AEFG
5,155,845	AEG
5,124,987	AEG
5,077,736	ADEG
4,897,874	AEFG
4,807,180	AE
4,787,028	AE
4,697,232	AE

Primary Reference: 5,812,754 *Claim Elements: ABF*

Secondary References	Claim Elements

6,219,771	ABCDEG

Primary Reference: 5,809,328 *Claim Elements: ABDEG*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG
5,634,111	ACDEF

Primary Reference: 5,805,816 *Claim Elements: AEF*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
6,219,771	ABCDEG
5,848,251	BCDFG
5,748,924	BCDG
5,396,596	ABCDG

Primary Reference: 5,768,623 *Claim Elements: E*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG

Primary Reference: 5,748,924 *Claim Elements: BCDG*

Secondary References	Claim Elements
5,805,816	AEF
5,634,111	ACDEF
5,613,082	ADEF
5,403,639	AEFG
5,379,398	ADEF
5,361,347	AEF
5,193,184	AEFG
4,897,874	AEFG

Primary Reference: 5,727,218 *Claim Elements: ABDEG*

Secondary References	Claim Elements

Fibre channel storage …	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG
5,634,111	ACDEF

Primary Reference: 5,634,111 *Claim Elements: ACDEF*

Secondary References	Claim Elements
SCSI applications on Fibre…	ABCEG
Fibre channel storage …	ABCDFG
Fiber Channel (FCS)/ATM …	ABDEG
6,219,771	ABCDEG
6,055,603	ABCFG
5,935,260	ABCG
5,848,251	BCDFG
5,809,328	ABDEG
5,748,924	BCDG
5,727,218	ABDEG
5,519,695	ABEG
5,396,596	ABCDG

Primary Reference: 5,632,012 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,621,902 *Claim Elements: ADEG*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG

Primary Reference: 5,613,082 *Claim Elements: ADEF*

Secondary References	Claim Elements
SCSI applications on Fibre…	ABCEG

Fibre channel storage ...	ABCDFG
6,219,771	ABCDEG
6,055,603	ABCFG
5,935,260	ABCG
5,848,251	BCDFG
5,748,924	BCDG
5,396,596	ABCDG

Primary Reference: 5,581,724 *Claim Elements: AEG*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,581,709 *Claim Elements: ADE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG

Primary Reference: 5,568,648 *Claim Elements: E*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG

Primary Reference: 5,564,019 *Claim Elements: F*

Secondary References	Claim Elements
6,219,771	ABCDEG

Primary Reference: 5,548,791 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,544,313 *Claim Elements: E*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG

Primary Reference:	***5,537,585***	*Claim Elements:*	*E*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG

Primary Reference:	***5,519,695***	*Claim Elements:*	*ABEG*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG
5,634,111	ACDEF

Primary Reference:	***5,511,169***	*Claim Elements:*	*DE*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG
6,055,603	ABCFG

Primary Reference:	***5,507,032***	*Claim Elements:*	*E*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG

Primary Reference:	***5,471,609***	*Claim Elements:*	*E*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG

Primary Reference:	***5,469,576***	*Claim Elements:*	*F*

Secondary References	**Claim Elements**
6,219,771	ABCDEG

Primary Reference:	***5,459,857***	*Claim Elements:*	*ABCE*

Secondary References	**Claim Elements**
High-Performance Data ...	DEFG
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference:	***5,430,855***	*Claim Elements:*	*AE*

Secondary References	**Claim Elements**

Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,423,026 *Claim Elements: E*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG

Primary Reference: 5,420,988 *Claim Elements: EG*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG

Primary Reference: 5,416,915 *Claim Elements: AE*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,410,697 *Claim Elements: AE*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,410,667 *Claim Elements: AE*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,403,639 *Claim Elements: AEFG*

Secondary References	**Claim Elements**
Fibre channel storage ...	ABCDFG
6,219,771	ABCDEG
5,848,251	BCDFG
5,748,924	BCDG
5,396,596	ABCDG

Primary Reference: 5,396,596 *Claim Elements: ABCDG*

Secondary References	Claim Elements
High-Performance Data ...	DEFG
5,805,816	AEF
5,634,111	ACDEF
5,613,082	ADEF
5,403,639	AEFG
5,379,398	ADEF
5,361,347	AEF
5,193,184	AEFG
4,897,874	AEFG

Primary Reference: 5,379,398 *Claim Elements: ADEF*

Secondary References	Claim Elements
SCSI applications on Fibre...	ABCEG
Fibre channel storage ...	ABCDFG
6,219,771	ABCDEG
6,055,603	ABCFG
5,935,260	ABCG
5,848,251	BCDFG
5,748,924	BCDG
5,396,596	ABCDG

Primary Reference: 5,379,385 *Claim Elements: AEG*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,367,646 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,361,347 *Claim Elements: AEF*

Secondary References	Claim Elements

Fibre channel storage .	ABCDFG
6,219,771	ABCDEG
5,848,251	BCDFG
5,748,924	BCDG
5,396,596	ABCDG

Primary Reference: 5,301,290 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,297,262 *Claim Elements: ADEG*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG

Primary Reference: 5,247,638 *Claim Elements: AEG*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,226,143 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,214,778 *Claim Elements: ADE*

Secondary References	Claim Elements
Fibre channel storage ...	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG

Primary Reference: 5,210,866 *Claim Elements: AEG*

Secondary References	Claim Elements

Fibre channel storage …	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,193,184 *Claim Elements: AEFG*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
6,219,771	ABCDEG
5,848,251	BCDFG
5,748,924	BCDG
5,396,596	ABCDG

Primary Reference: 5,193,168 *Claim Elements: DE*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
6,055,603	ABCFG

Primary Reference: 5,155,845 *Claim Elements: AEG*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,124,987 *Claim Elements: AEG*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
5,848,251	BCDFG

Primary Reference: 5,077,736 *Claim Elements: ADEG*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
6,055,603	ABCFG
5,848,251	BCDFG

Primary Reference: 4,897,874 *Claim Elements: AEFG*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG

6,219,771	ABCDEG
5,848,251	BCDFG
5,748,924	BCDG
5,396,596	ABCDG

Primary Reference: 4,807,180 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
5,848,251	BCDFG

Primary Reference: 4,787,028 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
5,848,251	BCDFG

Primary Reference: 4,697,232 *Claim Elements: AE*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG
5,848,251	BCDFG

Primary Reference: 4,455,605 *Claim Elements: E*

Secondary References	Claim Elements
Fibre channel storage …	ABCDFG

US006421753B1

(12) United States Patent
Hoese et al.

(10) Patent No.: US 6,421,753 B1
(45) Date of Patent: *Jul. 16, 2002

(54) STORAGE ROUTER AND METHOD FOR PROVIDING VIRTUAL LOCAL STORAGE

(75) Inventors: **Geoffrey B. Hoese**, Austin; **Jeffry T. Russell**, Cibolo, both of TX (US)

(73) Assignee: **Crossroads Systems, Inc.**, Austin, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **09/354,682**

(22) Filed: **Jul. 15, 1999**

Related U.S. Application Data

(63) Continuation of application No. 09/001,799, filed on Dec. 31, 1997, now Pat. No. 5,941,972.

(51) **Int. Cl.**[7] **G06F 13/00**

(52) **U.S. Cl.** **710/129**; 710/128; 710/8; 710/36; 710/105

(58) **Field of Search** 710/129, 1–5, 710/8–13, 36–38, 100–101, 105, 126–131; 714/42; 711/112, 113, 100

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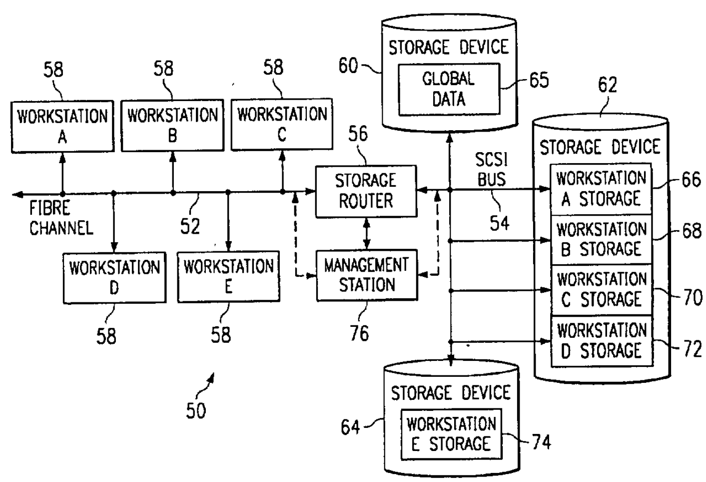
(57) **ABSTRACT**

A storage router (**56**) and storage network (**50**) provide virtual local storage on remote SCSI storage devices (**60, 62, 64**) to Fiber Channel devices. A plurality of Fiber Channel devices, such as workstations, (**58**), are connected to a Fiber Channel transport medium (**52**), and a plurality of SCSI storage devices (**60, 62, 64**) are connected to a SCSI bus transport medium (**54**). The storage router (**56**) interfaces between the Fiber Channel transport medium (**52**) and the SCSI bus transport medium (**54**). The storage router (**56**) maps between the workstations (**58**) and the SCSI storage devices (**60, 62, 64**) and implements access controls for storage space on the SCSI storage devices (**60, 62, 64**). The storage router (**56**) then allows access from the workstations (**58**) to the SCSI storage devices (**60, 62, 64**) using native low level, block protocol in accordance with the mapping and the access controls.

8 Claims, 2 Drawing Sheets



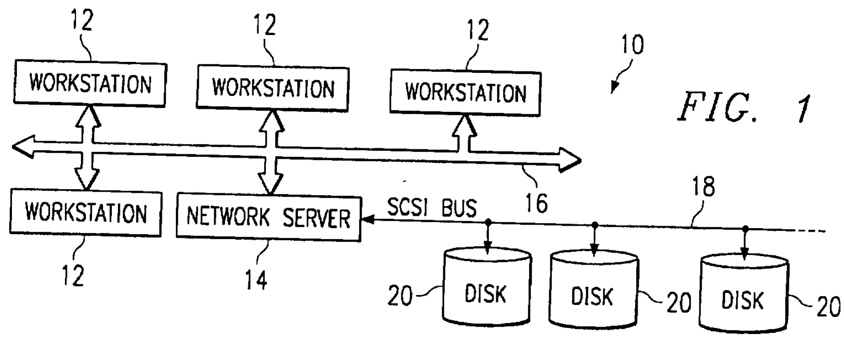


FIG. 1

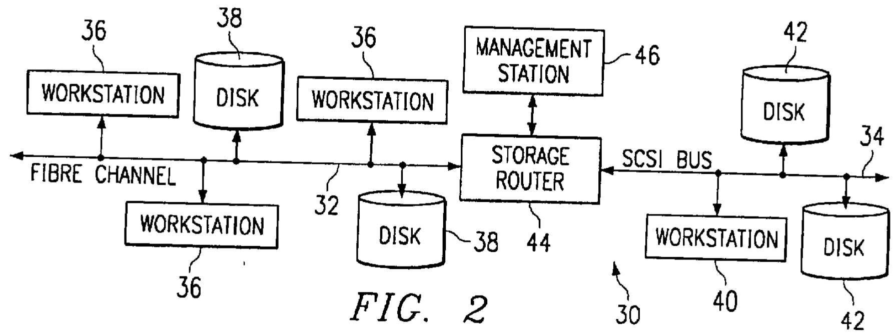


FIG. 2

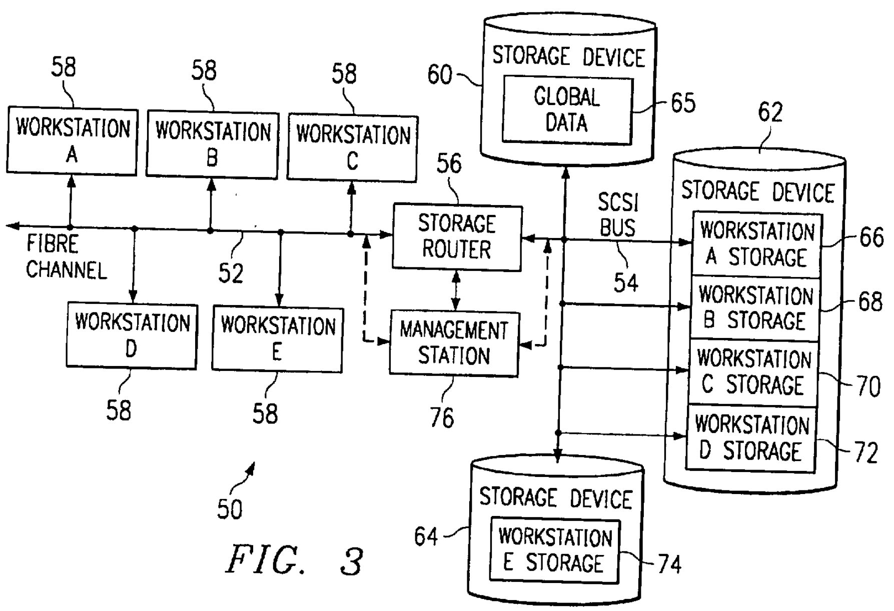


FIG. 3

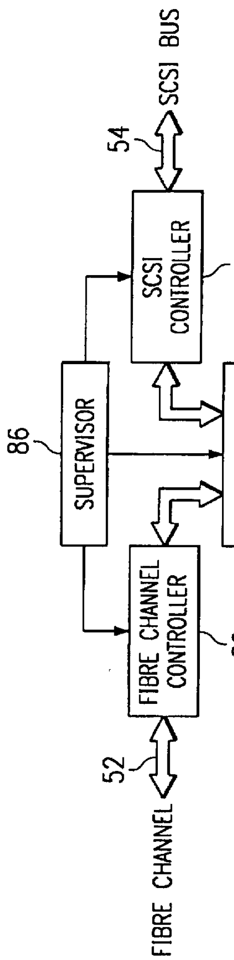

SCSI BUS
54
SCSI CONTROLLER
82
SUPERVISOR
86
BUFFER
84
FIBRE CHANNEL CONTROLLER
80
52
FIBRE CHANNEL
56

FIG. 4

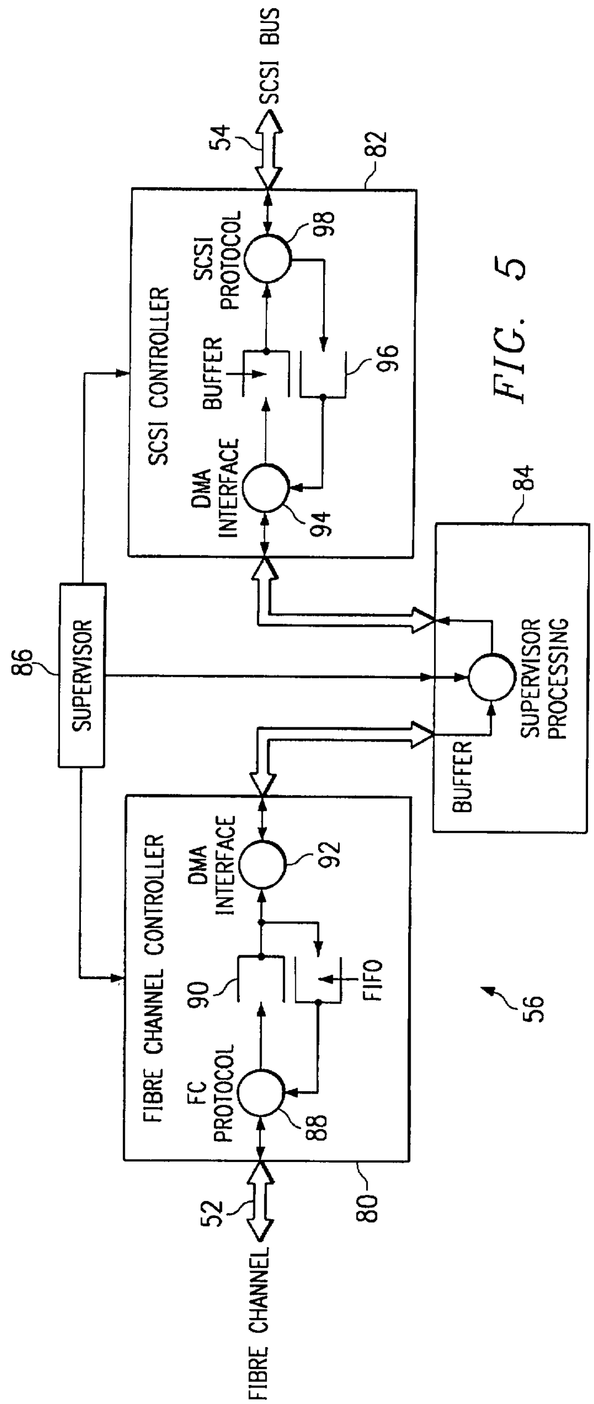

SCSI BUS
54
82
SCSI CONTROLLER
SCSI PROTOCOL
98
BUFFER
96
DMA INTERFACE
94
84
SUPERVISOR PROCESSING
BUFFER
86
SUPERVISOR
FIBRE CHANNEL CONTROLLER
DMA INTERFACE
92
FIFO
90
FC PROTOCOL
88
80
52
FIBRE CHANNEL
56

FIG. 5

STORAGE ROUTER AND METHOD FOR PROVIDING VIRTUAL LOCAL STORAGE

RELATED APPLICATIONS

This application is a continuation of, and claims priority from, U.S. patent application Ser. No. 09/001,799, filed on Dec. 31, 1997 now U.S. Pat. No. 5,941,972, now pending, the entire contects of which are hereby incorporated by reference herein.

TECHNICAL FIELD OF THE INVENTION

This invention relates in general to network storage devices, and more particularly to a storage router and method for providing virtual local storage on remote SCSI storage devices to Fibre Channel devices.

BACKGROUND OF THE INVENTION

Typical storage transport mediums provide for a relatively small number of devices to be attached over relatively short distances. One such transport medium is a Small Computer System Interface (SCSI) protocol, the structure and operation of which is generally well known as is described, for example, in the SCSI-1, SCSI-2 and SCSI-3 specifications. High speed serial interconnects provide enhanced capability to attach a large number of high speed devices to a common storage transport medium over large distances. One such serial interconnect is Fibre Channel, the structure and operation of which is described, for example, in Fibre Channel Physical and Signaling Interface (FC-PH), ANSI X3.230 Fibre Channel Arbitrated Loop (FC-AL), and ANSI X3.272 Fibre Channel Private Loop Direct Attach (FC-PLDA).

Conventional computing devices, such as computer workstations, generally access storage locally or through network interconnects. Local storage typically consists of a disk drive, tape drive, CD-ROM drive or other storage device contained within, or locally connected to the workstation. The workstation provides a file system structure, that includes security controls, with access to the local storage device through native low level, block protocols. These protocols map directly to the mechanisms used by the storage device and consist of data requests without security controls. Network interconnects typically provide access for a large number of computing devices to data storage on a remote network server. The remote network server provides file system structure, access control, and other miscellaneous capabilities that include the network interface. Access to data through the network server is through network protocols that the server must translate into low level requests to the storage device. A workstation with access to the server storage must translate its file system protocols into network protocols that are used to communicate with the server. Consequently, from the perspective of a workstation, or other computing device, seeking to access such server data, the access is much slower than access to data on a local storage device.

SUMMARY OF THE INVENTION

In accordance with the present invention, a storage router and method for providing virtual local storage on remote SCSI storage devices to Fibre Channel devices are disclosed that provide advantages over conventional network storage devices and methods.

According to one aspect of the present invention, a storage router and storage network provide virtual local storage on remote SCSI storage devices to Fibre Channel devices. A plurality of Fibre Channel devices, such as workstations, are connected to a Fibre Channel transport medium, and a plurality of SCSI storage devices are connected to a SCSI bus transport medium. The storage router interfaces between the Fibre Channel transport medium and the SCSI bus transport medium. The storage router maps between the workstations and the SCSI storage devices and implements access controls for storage space on the SCSI storage devices. The storage router then allows access from the workstations to the SCSI storage devices using native low level, block protocol in accordance with the mapping and the access controls.

According to another aspect of the present invention, virtual local storage on remote SCSI storage devices is provided to Fibre Channel devices. A Fibre Channel transport medium and a SCSI bus transport medium are interfaced with. A configuration is maintained for SCSI storage devices connected to the SCSI bus transport medium. The configuration maps between Fibre Channel devices and the SCSI storage devices and implements access controls for storage space on the SCSI storage devices. Access is then allowed from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration.

A technical advantage of the present invention is the ability to centralize local storage for networked workstations without any cost of speed or overhead. Each workstation access its virtual local storage as if it work locally connected. Further, the centralized storage devices can be located in a significantly remote position even in excess of ten kilometers as defined by Fibre Channel standards.

Another technical advantage of the present invention is the ability to centrally control and administer storage space for connected users without limiting the speed with which the users can access local data. In addition, global access to data, backups, virus scanning and redundancy can be more easily accomplished by centrally located storage devices.

A further technical advantage of the present invention is providing support for SCSI storage devices as local storage for Fibre Channel hosts. In addition, the present invention helps to provide extended capabilities for Fibre Channel and for management of storage subsystems.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the present invention and the advantages thereof may be acquired by referring to the following description taken in conjunction with the accompanying drawings, in which like reference numbers indicate like features, and wherein:

FIG. **1** is a block diagram of a conventional network that provides storage through a network server;

FIG. **2** is a block diagram of one embodiment of a storage network with a storage router that provides global access and outing;

FIG. **3** is a block diagram of one embodiment of a storage network with a storage router that provides virtual local storage;

FIG. **4** is a block diagram of one embodiment of the storage router of FIG. **3**; and

FIG. **5** is a block diagram of one embodiment of data flow within the storage router of FIG. **4**.

DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** is a block diagram of a conventional network, indicated generally at **10**, that provides access to storage through a network server. As shown, network **10** includes a plurality of workstations **12** interconnected with a network server **14** via a network transport medium **16**. Each workstation **12** can generally comprise a processor, memory, input/output devices, storage devices and a network adapter as well as other common computer components. Network server **14** uses a SCSI bus **18** as a storage transport medium to interconnect with a plurality of storage devices **20** (tape drives, disk drives, etc.). In the embodiment of FIG. **1**, network transport medium **16** is an network connection and storage devices **20** comprise hard disk drives, although there are numerous alternate transport mediums and storage devices.

In network **10**, each workstation **12** has access to its local storage device as well as network access to data on storage devices **20**. The access to a local storage device is typically through native low level, block protocols. On the other hand, access by a workstation **12** to storage devices **20** requires the participation of network server **14** which implements a file system and transfers data to workstations **12** only through high level file system protocols. Only network server **14** communicates with storage devices **20** via native low level, block protocols. Consequently, the network access by workstations. **12** through network server **14** is slow with respect to their access to local storage. In network **10**, it can Also be a logistical problem to centrally manage and administer local data distributed across an organization, including accomplishing tasks such as backups, virus scanning and redundancy.

FIG. **2** is a block diagram of one embodiment of a storage network, indicated generally at **30**, with a storage router that provides global access and routing. This environment is significantly different from that of FIG. **1** in that there is no network server involved. In FIG. **2**, a Fibre Channel high speed serial transport **32** interconnects a plurality of workstations **36** and storage devices **38**. A SCSI bus storage transport medium interconnects workstations **40** and storage devices **42**. A storage router **44** then serves to interconnect these mediums and provide devices on either medium global, transparent access to devices on the other medium. Storage router **44** routes requests from initiator devices on one medium to target devices on the other medium and routes data between the target and the initiator. Storage router **44** can allow initiators and targets to be on either side. In this manner, storage router **44** enhances the functionality of Fibre Channel **32** by providing access, for example, to legacy SCSI storage devices on SCSI bus **34**. In the embodiment of FIG. **2**, the operation of storage router **44** can be managed by a management station **46** connected to the storage router via a direct serial connection.

In storage network **30**, any workstation **36** or workstation **40** can access any storage device **38** or storage device **42** through native low level, block protocols, and vice versa. This functionality is enabled by storage router **44** which routes requests and data as a generic transport between Fibre Channel **32** and SCSI bus **34**. Storage router **44** uses tables to map devices from one medium to the other and distributes requests and data across Fibre Channel **32** and SCSI bus **34** without any security access controls. Although this extension of the high speed serial interconnect provided by Fibre Channel **32** is beneficial, it is desirable to provide security controls in addition to extended access to storage devices through a native low level, block protocol.

FIG. **3** is a block diagram of one embodiment of a storage network, indicated generally at **50**, with a storage router that provides virtual local storage. Similar to that of FIG. **2**, storage network **50** includes a Fibre Channel high speed serial interconnect **52** and a SCSI bus **54** bridged by a storage router **56**. Storage router **56** of FIG. **3** provides for a large number of workstations **58** to be interconnected on a common storage transport and to access common storage devices **60**, **62** and **64** through native low level, block protocols.

According to the present invention, storage router **56** has enhanced functionality to implement security controls and routing such that each workstation **58** can have access to a specific subset of the overall data stored in storage devices **60**, **62** and **64**. This specific subset of data has the appearance and characteristics of local storage and is referred to herein as virtual local storage. Storage router **56** allows the configuration and modification of the storage allocated to each attached workstation **58** through the use of mapping tables or other mapping techniques.

As shown in FIG. **3**, for example, storage device **60** can be configured to provide global data **65** which can be accessed by all workstations **58**. Storage device **62** can be configured to provide partitioned subsets **66**, **68**, **70** and **72**, where each partition is allocated to one of the workstations **58** (workstations A, B, C and D). These subsets **66**, **68**, **70** and **72** can only be accessed by the associated workstation **58** and appear to the associated workstation **58** as local storage accessed using native low level, block protocols. Similarly, storage device **64** can be allocated as storage for the remaining workstation **58** (workstation E).

Storage router **56** combines access control with routing such that each workstation **58** has controlled access to only the specified partition of storage device **62** which forms virtual local storage for the workstation **58**. This access control allows security control for the specified data partitions. Storage router **56** allows this allocation of storage devices **60**, **62** and **64** to be managed by a management station **76**. Management station **76** can connect directly to storage router **56** via a direct connection or, alternately, can interface with storage router **56** through either Fibre Channel **52** or SCSI bus **54**. In the latter case, management station **76** can be a workstation or other computing device with special rights such that storage router **56** allows access to mapping tables and shows storage devices **60**, **62** and **64** as they exist physically rather than as they have been allocated.

The environment of FIG. **3** extends the concept of a single workstation having locally connected storage devices to a storage network **50** in which workstations **58** are provided virtual local storage in a manner transparent to workstations **58**. Storage router **56** provides centralized control of what each workstation **58** sees as its local drive, as well as what data it sees as global data accessible by other workstations **58**. Consequently, the storage space considered by the workstation **58** to be its local storage is actually a partition (i.e., logical storage definition) of a physically remote storage device **60**, **62** or **64** connected through storage router **56**. This means that similar requests from workstations **58** for access to their local storage devices produce different accesses to the storage space on storage devices **60**, **62** and **64**. Further, no access from a workstation **58** is allowed to the virtual local storage of another workstation **58**.

The collective storage provided by storage devices **60**, **62** and **64** can have blocks allocated by programming means within storage router **56**. To accomplish this function, storage router **56** can include routing tables and security controls that define storage allocation for each workstation **58**. The advantages provided by implementing virtual local storage in centralized storage devices include the ability to do collective backups and other collective administrative functions more easily. This is accomplished without limiting the performance of workstations **58** because storage access involves native low level, block protocols and does not involve the overhead of high level protocols and file systems required by network servers.

FIG. **4** is a block diagram of one embodiment of storage router **56** of FIG. **3**. Storage router **56** can comprise a Fibre Channel controller **80** that interfaces with Fibre Channel **52** and a SCSI controller **82** that interfaces with SCSI bus **54**. A buffer **84** provides memory work space and is connected to both Fibre Channel controller **80** and to SCSI controller **82**. A supervisor unit **86** is connected to Fibre Channel controller **80**, SCSI controller **82** and buffer **84**. Supervisor unit **86** comprises a microprocessor for controlling operation of storage router **56** and to handle mapping and security access for requests between Fibre Channel **52** and SCSI bus **54**.

FIG. **5** is a block diagram of one embodiment of data flow within storage router **56** of FIG. **4**. As shown, data from Fibre Channel **52** is processed by a Fibre Channel (FC) protocol unit **88** and placed in a FIFO queue **90**. A direct memory access (DMA) interface **92** then takes data out of FIFO queue **90** and places it in buffer **84**. Supervisor unit **86** processes the data in buffer **84** as represented by supervisor processing **93**. This processing involves mapping between Fibre Channel **52** and SCSI bus **54** and applying access controls and routing functions. A DMA interface **94** then pulls data from buffer **84** and places it into a buffer **96**. A SCSI protocol unit **98** pulls data from buffer **96** and communicates the data on SCSI bus **54**. Data flow in the reverse direction, from SCSI bus **54** to Fibre Channel **52**, is accomplished in a reverse manner.

The storage router of the present invention is a bridge device that connects a Fibre Channel link directly to a SCSI bus and enables the exchange of SCSI command set information between application clients on SCSI bus devices and the Fibre Channel links. Further, the storage router applies access controls such that virtual local storage can be established in remote SCSI storage devices for workstations on the Fibre Channel link. In one embodiment, the storage router provides a connection for Fibre Channel links running the SCSI Fibre Channel Protocol (FCP) to legacy SCSI devices attached to a SCSI bus. The Fibre Channel topology is typically an Arbitrated Loop (FC_AL).

In part, the storage router enables a migration path to Fibre Channel based, serial SCSI networks by providing connectivity for legacy SCSI bus devices. The storage router can be attached to a Fibre Channel Arbitrated Loop and a SCSI bus to support a number of SCSI devices. Using configuration settings, the storage router can make the SCSI bus devices available on the Fibre Channel network as FCP logical units. Once the configuration is defined, operation of the storage router is transparent to application clients. In this manner, the storage router can form an integral part of the migration to new Fibre Channel based networks while providing a means to continue using legacy SCSI devices.

In one implementation (not shown), the storage router can be a rack mount or free standing device with an internal power supply. The storage router can have a Fibre Channel and SCSI port, and a standard, detachable power cord can be used, the FC connector can be a copper DB9 connector, and the SCSI connector can be a 68-pin type. Additional modular jacks can be provided for a serial port and a 802.3 10BaseT port, i.e. twisted pair Ethernet, for management access. The SCSI port of the storage router an support SCSI direct and sequential access target devices and can support SCSI initiators, as well. The Fibre Channel port can interface to SCSI-3 FCP enabled devices and initiators.

To accomplish its functionality, one implementation of the storage router uses: a Fibre Channel interface based on the HEWLETT-PACKARD TACHYON HPFC-5000 controller and a GLM media interface; an Intel 80960RP processor, incorporating independent data and program memory spaces, and associated logic required to implement a stand alone processing system; and a serial port for debug and system configuration. Further, this implementation includes a SCSI interface supporting Fast-20 based on the SYMBIOS 53C8xx series SCSI controllers, and an operating system based upon the WIND RIVERS SYSTEMS VXWORKS or IXWORKS kernel, as determined by design. In addition, the storage router includes software as required to control basic functions of the various elements, and to provide appropriate translations between the FC and SCSI protocols.

The storage router has various modes of operation that are possible between FC and SCSI target and initiator combinations. These modes are: FC Initiator to SCSI Target; SCSI Initiator to FC Target; SCSI Initiator to SCSI Target; and FC Initiator to FC Target. The first two modes can be supported concurrently in a single storage router device are discussed briefly below. The third mode can involve two storage router devices back to back and can serve primarily as a device to extend the physical distance beyond that possible via a direct SCSI connection. The last mode can be used to carry FC protocols encapsulated on other transmission technologies (e.g. ATM, SONET), or to act as a bridge between two FC loops (e.g. as a two port fabric).

The FC Initiator to SCSI Target mode provides for the basic configuration of a server using Fibre Channel to communicate with SCSI targets. This mode requires that a host system have an FC attached device and associated device drivers and software to generate SCSI-3 FCP requests. This system acts as an initiator using the storage router to communicate with SCSI target devices. The SCSI devices supported can include SCSI-2 compliant direct or sequential access (disk or tape) devices. The storage router serves to translate command and status information and transfer data between SCSI-3 FCP and SCSI-2, allowing the use of standard SCSI-2 devices in a Fibre Channel environment.

The SCSI Initiator to FC Target mode provides for the configuration of a server using SCSI-2 to communicate with Fibre Channel targets. This mode requires that a host system has a SCSI-2 interface and driver software to control SCSI-2 target devices. The storage router will connect to the SCSI-2 bus and respond as a target to multiple target IDs. Configuration information is required to identify the target IDs to which the bridge will respond on the SCSI-2 bus. The storage router then translates the SCSI-2 requests to SCSI-3 FCP requests, allowing the use of FC devices with a SCSI host system. This will also allow features such as a tape device acting as an initiator on the SCSI bus to provide full support for this type of SCSI device.

In general, user configuration of the storage router will be needed to support various functional modes of operation. Configuration can be modified, for example, through a serial port or through an Ethernet port via SNMP (simple network management protocol) or a Telnet session. Specifically, SNMP manageability can be provided via an 802.3 Ethernet interface. This can provide for configuration changes as well as providing statistics and error information. Configuration can also be performed via TELNET or RS-232 interfaces with menu driven command interfaces. Configuration information can be stored in a segment of flash memory and can be retained across resets and power off cycles. Password protection can also be provided.

In the first two modes of operation, addressing information is needed to map from FC addressing to SCSI addressing and vice versa. This can be 'hard' configuration data, due to the need for address information to be maintained across initialization and partial reconfigurations of the Fibre Channel address space. In an arbitrated loop configuration, user configured addresses will be needed for AL_PAs in order to insure that known addresses are provided between loop reconfigurations.

With respect to addressing, FCP and SCSI 2 systems employ different methods of addressing target devices. Additionally, the inclusion of a storage router means that a method of translating device IDs needs to be implemented. In addition, the storage router can respond to commands without passing the commands through to the opposite interface. This can be implemented to allow all generic FCP and SCSI commands to pass through the storage router to address attached devices, but allow for configuration and diagnostics to be performed directly on the storage router through the FC and SCSI interfaces.

Management commands are those intended to be processed by the storage router controller directly. This may include diagnostic, mode, and log commands as well as other vendor-specific commands. These commands can be received and processed by both the FCP and SCSI interfaces, but are not typically bridged to the opposite interface. These commands may also have side effects on the operation of the storage router, and cause other storage router operations to change or terminate.

A primary method of addressing management commands though the FCP and SCSI interfaces can be through peripheral device type addressing. For example, the storage router can respond to all operations addressed to logical unit (LUN) zero as a controller device. Commands that the storage router will support can include INQUIRY as well as vendor-specific management commands. These are to be generally consistent with SCC standard commands.

The SCSI bus is capable of establishing bus connections between targets. These targets may internally address logical units. Thus, the prioritized addressing scheme used by SCSI subsystems can be represented as follows: BUS:TARGET-:LOGICAL UNIT. The BUS identification is intrinsic in the configuration, as a SCSI initiator is attached to only one bus. Target addressing is handled by bus arbitration from information provided to the arbitrating device. Target addresses are assigned to SCSI devices directly, though some means of configuration, such as a hardware jumper, switch setting, or device specific software configuration. As such, the SCSI protocol provides only logical unit addressing within the Identify message. Bus and target information is implied by the established connection.

Fibre Channel devices within a fabric are addressed by a unique port identifier. This identifier is assigned to a port during certain well-defined states of the FC protocol. Individual ports are allowed to arbitrate for a known, user defined address. If such an address is not provided, or if arbitration for a particular user address fails, the port is assigned a unique address by the FC protocol. This address is generally not guaranteed to be unique between instances. Various scenarios exist where the AL-PA of a device will change, either after power cycle or loop reconfiguration.

The FC protocol also provides a logical unit address field within command structures to provide addressing to devices internal to a port. The FCP_CMD payload specifies an eight byte LUN field. Subsequent identification of the exchange between devices is provided by the FQXID (Fully Qualified Exchange ID).

FC ports can be required to have specific addresses assigned. Although basic functionality is not dependent on this, changes in the loop configuration could result in disk targets changing identifiers with the potential risk of data corruption or loss. This configuration can be straightforward, and can consist of providing the device a loop-unique ID (AL_PA) in the range of "01h" to "EFh." Storage routers could be shipped with a default value with the assumption that most configurations will be using single storage routers and no other devices requesting the present ID. This would provide a minimum amount of initial configuration to the system administrator. Alternately, storage routers could be defaulted to assume any address so that configurations requiring multiple storage routers on a loop would not require that the administrator assign a unique ID to the additional storage routers.

Address translation is needed where commands are issued in the cases FC Initiator to SCSI Target and SCSI Initiator to FC Target. Target responses are qualified by the FQXID and will retain the translation acquired at the beginning of the exchange. This prevents configuration changes occurring during the course of execution of a command from causing data or state information to be inadvertently misdirected. Configuration can be required in cases of SCSI Initiator to FC Target, as discovery may not effectively allow for FCP targets to consistently be found. This is due to an FC arbitrated loop supporting addressing of a larger number of devices than a SCSI bus and the possibility of FC devices changing their AL-PA due to device insertion or other loop initialization.

In the direct method, the translation to BUS:TARGET:LUN of the SCSI address information will be direct. That is, the values represented in the FCP LUN field will directly map to the values in effect on the SCSI bus. This provides a clean translation and does not require SCSI bus discovery. It also allows devices to be dynamically added to the SCSI bus without modifying the address map. It may not allow for complete discovery by FCP initiator devices, as gaps between device addresses may halt the discovery process. Legacy SCSI device drivers typically halt discovery on a target device at the first unoccupied LUN, and proceed to the next target. This would lead to some devices not being discovered. However, this allows for hot plugged devices and other changes to the loop addressing.

In the ordered method, ordered translation requires that the storage router perform discovery on reset, and collapses the addresses on the SCSI-bus to sequential FCP LUN values. Thus, the FCP LUN values 0–N can represent N+1 SCSI devices, regardless of SCSI address values, in the order in which they are isolated during the SCSI discovery process. This would allow the FCP initiator discovery process to identify all mapped SCSI devices without further configuration. This has the limitation that hot-plugged devices will not be identified until the next reset cycle. In this case, the address may also be altered as well.

In addition to addressing, according to the present invention, the storage router provides configuration and access controls that cause certain requests from FC Initiators to be directed to assigned virtual local storage partitioned on SCSI storage devices. For example, the same request for LUN 0 (local storage) by two different FC Initiators can be directed to two separate subsets of storage. The storage router can use tables to map, for each initiator, what storage access is available and what partition is being addressed by a particular request. In this manner, the storage space provided by SCSI storage devices can be allocated to FC initiators to provide virtual local storage as well as to create any other desired configuration for secured access.

Although the present invention has been described in detail, it should be understood that various changes, substitutions, and alterations can be made hereto without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A data storage gateway capable of interfacing with and providing connectivity and mapping between a Fiber Channel and SCSI channel interface, the data storage gateway comprising:

a virtual storage;

a storage router in communication with and providing mapping to the virtual storage such that a fiber channel device remote from the virtual storage can communicate data to and from the virtual storage; and

wherein the storage router is capable of configuring a SCSI device to contain at least a portion of the virtual storage.

2. The data storage gateway according to claim 1, further including a memory work space for the storage router using a buffer.

3. The data storage gateway according to claim 2 wherein a Fibre Channel transport medium connects to the storage router and interfaces with a Fibre Channel controller and wherein a SCSI bus transport medium connects to the storage router and interfaces with a SCSI controller.

4. A method for providing, through a storage router, virtual local storage on remote SCSI storage devices to Fibre Channel devices, comprising:

interfacing with a Fibre Channel transport medium;

interfacing with a SCSI bus transport medium;

maintaining a configuration for SCSI storage devices connected to the SCSI bus transport medium that maps between Fibre Channel devices and the SCSI storage devices and that implements access controls for storage space on the SCSI storage devices; and

allowing access from Fibre Channel initiator devices to SCSI storage devices using native low level, block protocol in accordance with the configuration.

5. The method of claim 4, further comprising the step of providing memory work space for the storage router using a buffer.

6. The method of claim 5, wherein the Fibre Channel transport medium connects to and interfaces with a Fibre Channel controller and wherein said SCSI bus transport medium connects to and interfaces with a SCSI controller.

7. The method of claim 5, wherein the maintaining step and the allowing step are performed by a supervisor unit.

8. The method of claim 7, wherein the supervisor unit is coupled to the Fibre Channel controller, the SCSI controller, and the buffer.

* * * * *

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