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

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WESTERN DISTRICT OF TEXAS

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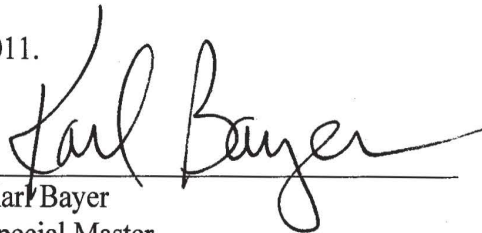| | |
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| CROSSROAD SYSTEMS, INC.<br><br>Plaintiff,<br><br>v.<br><br>3PAR, INC.,<br>AMERICAN MEGATRENDS, INC.,<br>RORKE DATA, INC.,<br>D-LINK SYSTEMS, INC.,<br>CHELSIO COMMUNICATIONS, INC. ( a<br>Delaware corporation).<br>ISTOR NETWORKS, INC., and<br>CHELSIO COMMUNICATIONS, INC. (a<br>California corporation)<br><br>Defendants. | Case No. 1:10-CV-652-SS |

## REPORT AND RECOMMENDATIONS OF THE SPECIAL MASTER REGARDING UNITED STATES PATENT NO.'S 7,051,147 & 6,425,035 B2

Attached hereto is the Special Master's Report and Recommendations to United States District Judge Sam Sparks regarding the construction of claims in United States Patent No.'s 7,051,147 & 6,425,035 B2.

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, as discussed at the conclusion of the *Markman* hearing.

SIGNED this the 9th day of August, 2011.

Karl Bayer
Special Master

## CERTIFICATE OF SERVICE

I hereby certify that on the 9th day of August, 2011, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to counsel of record in this action.


_/s/   Karl Bayer_____
Karl Bayer

## SPECIAL MASTER'S RECOMMENDED CONSTRUCTIONS
## PATENT NO. 6,425,035 B2

| Term | Special Master's Recommended Construction |
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| Device | No Construction Necessary. |
| Implement access controls for storage space on the storage devices. | "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |
| Allow access from devices…to the storage devices using native low level, block protocol. | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |
| Native low level block protocol (NLLBP) | "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." |
| Workstation | "A computer having input/output devices intended for use by humans." |
| Access control(s) | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| United States Patent No. 6,425,035 B2 | | | | | |
| **Claim 1:** | | | | | |
| A storage router for providing virtual local storage on remote storage devices to **devices**, comprising: | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1,[1] Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("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 "). | **Device:** Computer. | **Intrinsic Evidence** 1:37-39[2], 47-49, 57-60 4:29-33 ("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.") 4:39-40 4:58-59 ("no access from a workstation 58 is allowed to the virtual local storage of another workstation." *Cf.* Fig. 2 and Fig. 3 -- First Reexam Reply[3] at 8-9, 15 -- | No Construction Necessary. |

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[1] United States Patent No. 6,425,035 ("the '035 Patent") and United States Patent No. 7,051,147 ("the '147 Patent") share a common specification. To facilitate cross-referencing, unless noted otherwise, all Col:Line cites in the charts of proposed claim constructions are to the '035 Patent.

[2] As in the claim construction briefs previously submitted to the Court, all specification citations are to the '035 patent unless otherwise noted.

[3] For the sake of clarity, commonly cited documents are referenced in the "Defendants' Evidence" column by the abbreviated names used in prior briefing. A table of these abbreviations was included in Defendant's Reply Post-Hearing Brief and is also appended to this table.

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices). April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, | | Second Reexam Reply at 7, 8, 8-15 passim, 16, 17, 22, 23, 28, 39-40 Second Reexam Reply at 7 ("The invention of the '035 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.") Second Reexam Reply at 8 ("Thus, the present invention…allows the host computers to access the remote storage devices over the network…") Second Reexam Reply at 15 ("In summary, the invention of the '035 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 | |

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| | | 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly | | between host computers and the remote storage devices...." Second Reexam Reply at 16 ("The present invention as recited in Claim 1 thus enables computers to access remote storage devices...")<br><br>Second Reexam Reply at 35 (Spring "does not teach access controls as defined by the '035 Patent"; "in contrast to the invention of the '035 Patent, this [access control] methodology described in Spring does not limit access of particular workstations to specific assigned subsets of storage devices or portions thereof.")<br><br>**Extrinsic Evidence**<br><br>Jt. Ex. 109, *Crossroads v. Chaparral*, Joint Claim Construction Order at 3 Crossroads' argument that "implements access controls" should be construed as "provides | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| | | used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources | | controls which limit a computer's access") Def. Ex. 19, Rudolf Graf, *Modern Dictionary of Electronics* (1999) at 353 Def. Ex. 20, *Microsoft Computer Dictionary* (5th ed. 2002) at 256 Berg Decl. ¶ 59-63. | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| | | to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| a buffer providing memory work space for the storage router; a first controller operable to connect to and interface with a first transport medium; 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 | **Implement access controls for storage space on the storage devices:**<br><br>"Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Implement access controls for storage space on the storage devices:**<br><br>**Intrinsic:**<br><br>Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device).<br><br>Col. 4, ll. 7-11 ("access controls" applies to shared storage). | **Access controls:**<br><br>Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | **Intrinsic Evidence**<br><br>3:30-32, 56-59 ("FIG. 2..., indicated generally at 30, with a storage router that provides global access and routing.... 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.")<br><br>4:17-24, 26-27 ("As shown in FIG. 3, for | "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| transport medium and the storage devices, to **implement access controls for storage space on the storage devices** and to process data in the buffer to interface between the first controller and the second controller to allow access from devices connected to the first transport medium to the storage devices using native low level, block protocols. | | July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or | | example, storage device 50 can be configured to provide global data 65 which can be accessed by all workstation 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....Similarly, storage device 64 can be allocated as storage for the remaining workstation 58 (workstation E)."<br><br>Fig. 3<br>--<br><br>First Reexam Reply at 13 ("[T] the access controls provide the capability to permit or deny each computer access to a particular storage device, a set of storage devices or | |

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| | | Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | 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 workstation from overwriting or modifying data in storage assigned to another computer workstation.")<br><br>First Reexam Reply at 33 ("The access controls of claim 1 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....")<br>--<br><br>Second Reexam Reply at 13 ("By assigning storage devices or portions thereof to | |

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| | | | | particular computer workstations, the present invention prevents each computer workstations [sic] from overwriting or modifying data in storage assigned to another workstation"). <br><br> Second Reexam Reply at 33 ("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 '035 Patent.") <br><br> Second Reexam Reply at 33 ("The access controls of the '035 Patent depend on the map discussed above to control access....In other words, the storage to which | |

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| | | | | each workstation is permitted access is controlled through the use of the map....The access controls...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.")<br><br>Def. Ex. 8, NIIRC ("the map/mapping feature...is a one-to-one correspondence...where by the router forms the connection between two separate entities over different transport mediums.")<br><br>--<br>U.S. Pat. ____ '036 patent Reply to Office Action at 15<br><br>U.S. Pat. 6,421,753 Patent Reply to Office Action at 12<br><br>U.S. Pat. 6,738,854 | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | | | patent Reply to Office Action at 19<br><br>U.S. Pat.5,942,972 Reply to Office Action at 13. | |
| 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, to implement access controls for storage space on the storage devices and to process data in the buffer to interface between the first controller and the second controller to **allow access from devices** connected to the first transport medium to the storage devices **using native low level, block protocols.** | **Allow access from devices …to the storage devices using native low level block protocols:**<br><br>"Permit or deny reading or writing of data using the NLLBP of the Virtual Local Storage without involving a translation from a high level file system command to a native low level, block protocol request." | **Allow access from devices . . . to the storage devices using native low level block protocols:**<br><br>**Intrinsic:**<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, | **Allow access...to the storage devices using native low level, block protocols:**<br><br>Permit reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | **IN GENERAL – Intrinsic Evidence**<br><br>1:43-46<br><br>--<br><br>First Reexam Reply at 8 ("features of the present invention…also allow a host (or hosts) to communicate with storage devices using only native low level block protocols.") (emphasis added)<br><br>First Reexam Reply at 10 (system in which "at least one high level to low level translation takes place between the workstation and the storage device" reflects prior art, not the alleged invention)<br><br>First Reexam Reply at 19 ("Petal, on the other hand, teaches a system in which a Petal client issues high level | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| | | block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access). Col. 4, ll. 7-47 (invention of patents-in-suit provides "virtual local storage" that appears to a workstation as local storage, and appears to have the same characteristics of local storage). Col. 4, ll. 44-57 ("virtual local storage" is "provided" by the storage router in a manner that is transparent to the devices requesting storage access). Col. 5, ll. 11-17, ll. 24-27 (supervisor unit within the storage router processes NLLBP requests from the devices to access permitted storage). Abstract; Col. 2, ll. 12- | | commands....Consequently, the Petal server does not allow the Petal clients to access the storage devices using an NLLBP"), First Reexam Reply at 23 -- Second Reexam Reply at 16 ("Spring and Oeda, in contrast to the invention of the '035 Patent...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 GENERAL – Extrinsic Evidence** Berg. Decl. ¶¶ 14-29, 36-58 Levy Decl. ¶ 36 ("the invention of the Patents- | |

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| | | 15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access). <br><br> Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers). <br><br> Col. 1, ll. 57-60 ("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 "). <br><br> Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). <br><br> Col. 3, ll. 17-23 (the | | in-Suit enables the workstation to send an NLLBP to the storage router in order to make a request for data.") <br><br> **WITHOUT INVOLVING NETWORK SERVERS –** **Intrinsic Evidence** <br><br> 1:47-60, 2:51-52, 2:67-3:9, 3:16-25 (describing problems of network server-based systems) <br><br> 1:50-54 ("Access to data through the network server is through a network protocol that the server must translate into low level requests to the storage device") <br><br> 3:32-34 ("significantly different from FIG. 1 in that there is no network server involved") <br><br> 5:1-5 (access is "accomplished without limiting the performance of workstations 58 because storage access involves native low level, block | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| | | "network protocol" used by the prior art "network servers" to allow access to storage devices is a protocol that includes a high level file system command that must be translated into low level storage requests).<br><br>April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. | | protocols and does not involve the overhead of high level protocols and file systems required by network servers.")<br><br>--<br><br>First Reexam Reply at 8-9 (distinguishing Petal on basis that workstation must create network protocols to communicate with network server)<br><br>First Reexam Reply at 9-10 (noting that use of a network server necessarily involves translation to higher level protocols)<br><br>First Reexam Reply at 11 ("the Petal system does not allow the client (i.e. workstation) to access the storage devices using an NLLBP....[W]hile the Examiner has pointed out various portions of Petal that discuss using block level (i.e. low level) storage protocols, it is only in the context of the time period after high level RPCs have | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| | | ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). <br><br> Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without | | been transformed to low level SCSI commands. The system of Petal is the type of system that the present invention was designed to overcome...") <br> -- <br><br> Second Reexam Reply at 10, 12, 13, 22 <br><br> Second Reexam Reply at 9-10 ("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. Thus, the introduction of a network server into the system creates a bottleneck which slows down access to remote storage devices.") (citing '035 patent at 1:47-54) <br><br> Second Reexam Reply | |

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| | | involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶¶ 9-13 (data transfer in networks best understood as having layers; when TCP/IP and Ethernet protocols were used by prior art systems to transport high level network file system requests, a network server would translate such requests into low level requests to access storage); ¶¶6-7 (prior art "server" described in patents-in-suit was specifically a device that allowed access between the | | at 11 ("It takes the computer time to create a network protocol")<br><br>Second Reexam Reply at 13 (the invention "does away with the time consuming and complex steps of creating and processing higher-level network protocols at a server.") (emphasis added)<br><br>Second Reexam Reply at 13 ("The present invention thus routes NLLBPs to the remote storage devices without involving a network server.")<br><br>Second Reexam Reply at 10-13 (Graphics 2-4). Second Reexam Reply at 22 (workstation must create network protocols to communicate with network server)<br><br>Second Reexam Reply at 22 ("This ability to allow access from host computers to storage devices using a NLLBP, as recited in Claim 1, requires allowing access | |

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| | | device requesting "access to data" and the storage devices using something called a "network protocol"; such "servers" implemented file systems and received high level file system protocols from devices requesting data access).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area | | 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.")<br><br>Second Reexam Reply at 22 ("As discussed above, in systems prior to the present invention, when making a request to storage through a network server..., 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)...")<br><br>Second Reexam Reply at 23 ("Using the example of a first transport medium of Fibre Channel ("FC") and a second transport medium of SCSI, a FC | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| | | network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). <br><br> Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). <br><br> Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network | | workstation can communicate SCSI commands to a storage device using the FC protocol through the storage router.") <br> -- <br><br> '147 Reply at 13 (noting that use of a network server necessarily involves translation to higher level protocols); <br><br> '147 Reply at 13 ("Thus the Specification points that a native low level block protocol is one that does not involve the overhead of high level protocols used by network servers"). <br><br> **WITHOUT INVOLVING NETWORK SERVERS** – <u>Extrinsic Evidence</u> <br><br> Horst Decl. ¶ 16. <br><br> Horst Decl. ¶ 16-18. Second Reexam Reply at 9-10 ("In typical prior art systems…to overcome the inability | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, | | of a SCSI-to-SCSI system to provide remote storage…workstations were connected to a network server using a distance capable network transport medium and a network protocol such as Ethernet.")<br><br>Horst Decl. ¶ 15 ("Before Crossroads' invention of the '035 Patents, a network server (also known as a network file server) was the way networked computers connected to remote storage")<br><br>Horst Decl. ¶¶ 16-17 ("A network file server creates a bottleneck that slows down remote access. This is because the "computer or network server needs to use a high level 'network protocol' request to communicate with the network server. This introduces delay into the storage access process…") | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without | | Horst Decl. ¶ 18.<br><br>Levy Decl. ¶ 28-30<br><br>Levy Decl. ¶ 29 ("The use of a network file server introduces a bottleneck because the workstation takes time to translate its file system protocols to network protocols and the network server takes time to process the network protocol in order to issue the appropriate native low level block commands to the storage device to satisfy the request received from the workstation.")<br><br>Levy Decl. ¶ 29-30 ( in order to read and write data through a file server, tworkstation must issue multiple commands (create, open, read or write, and close) which the server must execute)<br><br>Levy Decl. ¶ 30 ("The various steps to create, open, read, write and close files can be | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶3 (a workstation gets "access to the local storage device through native low level block protocols").<br><br>Hr'g Tr. at 129:7-13, March 8, 2011 (Defendants agreed to remove "without involving . . . Ethernet networks, Ethernet protocols, TCP/IP" from their proposed construction).March 7, | | particularly time consuming.")<br><br>Levy Decl. ¶ 33<br><br>Pl. Br. 13-14 ("The '035 Patent introduces and defines the term NLLBP from the perspective of a workstation accessing local storage; specifically, an NLLBP is what is used by a workstation to access local storage.")<br><br>Pl. Br. 14 ("Therefore, just as the workstation sends an NLLBP request to access its local storage, using a storage router in the present invention, the workstation will similarly send an NLLBP request to the storage router.")<br><br>Hrg. Tr. 244:5-14 ("Well, sure. It has the same problem at the workstation...")<br><br>Hrg. Tr. 225:5-9.<br><br>**WITHOUT** | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). <br><br> February 22, 2011 Decl. of John Levy, Ph.D., ¶36 (NLLBP "used" by the storage router to allow access is the NLLBP sent to it from the device; this NLLBP is the NLLBP appropriate for the virtual local storage, not the NLLBP of the storage device storing the data). <br><br> Dictionary of Computer and Internet Terms 311 (6th Ed. 1996), Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. S (defining "native" as "1. designed for a specific hardware or software environment (rather than for compatibility with something else)"). <br><br> Stip. Defs. of Cl. Terms, Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. I (parties agree that | | **INVOLVING NETWORK PROTOCOLS** <br><br> **Intrinsic Evidence** <br><br> Second Reexam Reply at 9-10 ("In typical prior art systems…to overcome the inability of a SCSI-to-SCSI system to provide remote storage…workstations were connected to a network server using a distance capable network transport medium and a network protocol such as Ethernet. 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.") (citing 1:47-54) (emphasis added) | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | "virtual local storage" is "storage space, in a storage device that is remotely connected to an initiator device to be within or locally connected to the initiator device"). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol). | | Second Reexam Reply at 24 ("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.") Second Reexam Reply at 24 ("Ethernet networks required the use of high-level protocols to transmit information between a workstation and a network server....The problem with this type of system is exactly the problem that the '035 Patent described in the Background of the Invention and was designed to overcome.") Second Reexam Reply at 35 ("the Ethernet based system of Spring relies on higher level protocols to achieve remote storage") Def. Ex. 8, NIIRC ("TCP/IP, e.g., used in Ethernet communications...is not considered to be a | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | | | NLLBP")<br><br>**WITHOUT INVOLVING NETWORK PROTOCOLS**<br>–<br>**Extrinsic Evidence**<br><br>Berg. Decl.¶¶ 46-48<br><br>Berg. App. H at 80-81<br><br><br><br>**WITHOUT INVOLVING FILE SYSTEM COMMANDS**<br>–<br>**Intrinsic Evidence**<br><br>First Reexam Reply at 10 ("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")<br><br>First Reexam Reply at 11 (stating that the Petal reference uses "file system commands" and | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | | | therefore "does not allow the client (i.e., workstation) to access the storage devices using an NLLBP") **WITHOUT INVOLVING TRANSLATION FROM ONE PROTOCOL TO ANOTHER –** <u>Intrinsic Evidence</u> First Reexam Reply at 10-11 ("Therefore, Petal does not disclose, teach or suggest a system for 'allowing access...using native low level, block protocols as recited' in the claims.") First Reexam Reply at 10 ("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 | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | | | function call with arguments) into a low level SCSI command." First Reexam Reply at 22 ("Thus, the devices of Claim 1 connected to the first data transport protocol can access the storage devices using commands that do not require translation from a high level protocol to a low-level protocol.") **WITHOUT INVOLVING TRANSLATION FROM ONE PROTOCOL TO ANOTHER –** <u>Extrinsic Evidence</u> Berg Decl. ¶¶ 30-34 | |
| 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, to implement access controls for storage | **Native low level block protocol ("NLLBP"):** **Native:** "Designed for use with a specific type of storage device." **Block Protocol:** "A set of rules or standards for exchanging information | **Native low level block protocol:** **Intrinsic:** Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48- | **Native low level block protocol:** *Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:* **Native:** Designed for use with a | **IN GENERAL –** <u>Extrinsic Evidence</u> Berg. Decl. ¶ 41-43 **NATIVE –** <u>Intrinsic Evidence</u> 1.43-46 ("These protocols map directly to the mechanisms used by the storage device.") | "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." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| space on the storage devices and to process data in the buffer to interface between the first controller and the second controller to allow access from devices connected to the first transport medium to the storage devices using **native low level, block protocols.** | with a block-oriented storage device." <br><br> **Low Level . . . Protocol:** "A set of rules or standards that enable computers to exchange information without involving high level file system protocols." <br><br> Or, in the alternative: <br><br> **Native Low Level Block Protocol:** <br><br> "A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | 49 (specification consistently uses "NLLBP" as a single term). <br><br> Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server). <br><br> Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices). <br><br> Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, | specific type of storage device. <br><br> **Low-level protocol:** A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols. <br><br> **Block protocol:** A set of rules or standards for exchanging information with a block-oriented storage device | 1:52-54 (""that the server must translate into low level requests to the storage device") <br><br> 2:29-31 (each "workstation access[es] its virtual local storage as if it work [sic: were] locally connected") <br><br> **NATIVE – Extrinsic Evidence** <br><br> Berg. Decl. ¶ 44-45 <br><br> Def. Ex. 17, *Webster's New World Dictionary of Computer Terms* (5th ed. 1994) (a native compiler is "a compiler that produces code usable only for a particular computer;" native language is "a computer language peculiar to the machines of one manufacturer"); <br><br> Def. Ex. 21, *Dictionary.com Unabridged* (based on *Random House Dictionary 2010*), accessed from http://dictionary.referen | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g | | ce.com on 2/12/2011.<br><br>Def. Ex. 22, *IEEE Standard Glossary of Computer Networking Terminology* (1995) at 32. (a protocol converter is "a dedicated device that translates the protocol native to an end-user device into a different protocol").<br><br>Levy Decl. ¶ 36 (alleged invention "presents virtual local storage to the workstation that looks just like local storage to the workstation")<br><br>Levy Supp. Decl. ¶ 23 ("Consequently, the host system will access the virtual local storage using the NLLBP appropriate for storage that the host system sees as its local storage.")<br><br>**LOW LEVEL PROTOCOL:** *See "Allowing access…using native low level block protocol", supra.* | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the | | **BLOCK PROTOCOL – Intrinsic Evidence** 1:54-56 (block protocols are distinct from, for example, file system protocols that handle data as files)<br><br>**BLOCK PROTOCOL –**<br><br>**Extrinsic Evidence** Def. Ex. 19, Rudolf Graf, *Modern Dictionary of Electronics* (1999) at 76<br><br>Def. Ex. 20, *Microsoft Computer Dictionary* (5th ed. 2002) at 65 ("block device")<br><br>Berg. Decl. ¶ 49-52 | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). | | | |
| | | Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments). | | | |
| | | Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks"). | | | |
| | | Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | network protocols or file systems).<br><br>Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers).<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art).<br><br>Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification)<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages).<br><br>March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | command would be a low level command).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols.").<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP).<br><br>Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
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| | | writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.") | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network servers communicating with storage using NLLBPs). | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| **Claim 2:** | | | | | |
| The storage router of claim 1, wherein the supervisor unit maintains an allocation of subsets of storage space to associated **devices** connected to the first transport medium, wherein each subset is only accessible by the associated device connected to the first transport medium. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, | **Device:**<br><br>Computer. | *See claim 1, supra.* [4] | No Construction Necessary. |

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[4] For this and other claim terms appearing in multiple claims, the parties have not identified any evidentiary issues that are different between different claims. Therefore, for the sake of brevity and clarity, Defendants avoid repetition of issues addressed in detail previously in this chart.

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices). April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). **Extrinsic:** April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 3:** | | | | | |
| The storage router of claim 2, wherein the **devices** connected to the first transport medium comprise workstations. | **Device:** <br><br> "Computing device that issues storage access requests." | **Device:** <br><br> **Intrinsic:** <br><br> Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). <br><br> Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). <br><br> Col. 1, ll. 57-60 ("from the perspective of a workstation, or other | **Device:** <br><br> Computer. | *See claim 1, supra.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | computing device, seeking to access such server data, the access is much slower than access to data on a local storage device "). | | | |
| | | Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). | | | |
| | | Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). | | | |
| | | Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| The storage router of claim 2, wherein the devices connected to the first transport medium comprise **workstations**. | **Workstations:** <br><br> "A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:** <br><br> **Intrinsic:** <br><br> Col. 4, ll. 39-41 (specification defines workstation as a "computing device"). <br><br> **Extrinsic:** <br><br> *Chaparral* Markman Order at 16, Fore Decl. | **Workstation:** <br><br> A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | **Extrinsic Evidence** <br><br> Berg Decl. ¶ 64-65 <br><br> Def. Ex. 19, Rudolf Graf, *Modern Dictionary of Electronics* (1999) at 854 ("A personal computer or terminal device…which is used by someone to perform the greater part of his or | "A computer having input/output devices intended for use by humans." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); <u>Microsoft Press Computer Dictionary</u> 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | her everyday work"). <br><br> Def. Ex. 20, *Microsoft Computer Dictionary* (5th ed. 2005) at 574. <br><br> Pl. Br. Ex. Z, *Microsoft Press Computer Dictionary* (1991) at 368. | |
| **Claim 4:** | | | | | |
| The storage router of claim 2, wherein the storage devices comprise hard disk drives. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 5:** | | | | | |
| The storage router of claim 1, wherein the first controller comprises: a first protocol unit operable to connect to the first transport medium; | [No claim term at issue] | | [No claim term at issue] | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| a first-in-first-out queue coupled to the first protocol unit; and a direct memory access (DMA) interface coupled to the first-in-first-out queue and to the buffer. | | | | | |
| **Claim 6:** | | | | | |
| The storage router of claim 1, wherein the second controller comprises: a second protocol unit operable to connect to the second transport medium; an internal buffer coupled to the second protocol unit; and a direct memory access (DMA) interface coupled to the internal buffer and to the buffer of the storage router. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 7:** | | | | | |
| A storage network, comprising: a first transport medium; a second transport medium; a plurality of **workstations** connected to the first transport medium; | **Workstations:** "A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:** **Intrinsic:** Col. 4, ll. 39-41 (specification defines workstation as a "computing device"). | **Workstation:** A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | *See claim 3, supra.* | "A computer having input/output devices intended for use by humans." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); <u>Microsoft Press Computer Dictionary</u> 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | | |
| a plurality of storage devices connected to the second transport medium; and<br>a storage router interfacing between the first transport medium and the second transport medium, the storage | **Implement access controls for storage space on the storage devices:**<br><br>"Provides controls which limit a device's access to a specific subset of storage devices or sections of a | **Implement access controls for storage space on the storage devices:**<br><br>**Intrinsic:**<br><br>Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 | **Access controls:**<br><br>Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading | *See claim 1, supra.* | "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| router providing virtual local storage on the storage devices to the workstations and operable:<br>to map between the workstations and the storage devices;<br>to **implement access controls for storage space on the storage devices;** | single storage device according to a map." | (Fig. 3 shows embodiment in which all workstations can access global storage device).<br><br>Col. 4, ll. 7-11 ("access controls" applies to shared storage).<br><br>July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; | data to or writing data from storage space assigned to other devices. | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |
| and to **allow access** from the workstations **to the storage devices using native low level, block protocol** in accordance with the mapping and access controls. | **Allow access...to the storage devices using native low level block protocol:**<br><br>"Permit or deny reading or writing of data using the NLLBP of the Virtual Local Storage without involving a translation from a high level file system command to a native low level, block protocol request." | **Allow access . . . to the storage devices using native low level block protocol:**<br><br>**Intrinsic:**<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands | **Allow access...to the storage devices using native low level, block protocol:**<br><br>Permit reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network | *See claim 1, supra.* | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices). | protocols or file system protocols, or translation from one protocol to another. | | |
| | | Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access). | | | |
| | | Col. 4, ll. 7-47 (invention of patents-in-suit provides "virtual local storage" that appears to a workstation as local storage, and appears to have the same characteristics of local storage). | | | |
| | | Col. 4, ll. 44-57 ("virtual local storage" is "provided" by the storage router in a | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | manner that is transparent to the devices requesting storage access).<br><br>Col. 5, ll. 11-17, ll. 24-27 (supervisor unit within the storage router processes NLLBP requests from the devices to access permitted storage).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>Col. 1, ll. 57-60 ("from the perspective of a workstation, or other computing device, seeking to access such | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | server data, the access is much slower than access to data on a local storage device "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 3, ll. 17-23 (the "network protocol" used by the prior art "network servers" to allow access to storage devices is a protocol that includes a high level file system command that must be translated into low level storage requests). April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments). Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks"). **Extrinsic:** March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶¶ 9-13 (data transfer in networks best understood as having layers; when TCP/IP | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | and Ethernet protocols were used by prior art systems to transport high level network file system requests, a network server would translate such requests into low level requests to access storage); ¶¶6-7 (prior art "server" described in patents-in-suit was specifically a device that allowed access between the device requesting "access to data" and the storage devices using something called a "network protocol"; such "servers" implemented file systems and received high level file system protocols from devices requesting data access).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | workstations into a storage network"). Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server"). Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). <br><br> Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")  April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).  March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).  April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶3 (a workstation | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | gets "access to the local storage device through native low level block protocols"). Hr'g Tr. at 129:7-13, March 8, 2011 (Defendants agreed to remove "without involving . . . Ethernet networks, Ethernet protocols, TCP/IP" from their proposed construction).March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). February 22, 2011 Decl. of John Levy, Ph.D., ¶36 (NLLBP "used" by the storage router to allow access is the NLLBP sent to it from the device; this NLLBP is the NLLBP appropriate for the virtual local storage, not the NLLBP of the storage device storing the data). Dictionary of Computer and Internet Terms 311 | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | (6th Ed. 1996), Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. S (defining "native" as "1. designed for a specific hardware or software environment (rather than for compatibility with something else)"). <br><br> Stip. Defs. of Cl. Terms, Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. I (parties agree that "virtual local storage" is "storage space, in a storage device that is remotely connected to an initiator device to be within or locally connected to the initiator device"). <br><br> April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol). | | | |
| and to allow access from the workstations to the storage devices using **native low level,** | **Native low level block protocol ("NLLBP"):** <br><br> **Native:** | **Native low level block protocol:** <br><br> **Intrinsic:** | **Native low level block protocol:** <br><br> *Does not need to be* | *See claim 1, supra.* | "A set of rules or standards that enable computers to exchange information |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| **block protocol** in accordance with the mapping and access controls. | "Designed for use with a specific type of storage device."<br><br>**Block Protocol:** "A set of rules or standards for exchanging information with a block-oriented storage device."<br><br>**Low Level . . . Protocol:** "A set of rules or standards that enable computers to exchange information without involving high level file system protocols."<br><br>Or, in the alternative:<br><br>**Native Low Level Block Protocol:**<br><br>"A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term).<br><br>Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server).<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices). | *separately construed; alternatively, may be construed with reference to individual terms as follows:*<br><br>**Native:** Designed for use with a specific type of storage device.<br><br>**Low-level protocol:** A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols.<br><br>**Block protocol:** A set of rules or standards for exchanging information with a block-oriented storage device | | and do not involve the overhead of high level protocols and file systems typically required by network servers." |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access). Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access). Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers). April 6, 2005 Reply to | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices). April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | "Fibre Channel based networks").<br><br>Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems).<br><br>Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers).<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art).<br><br>Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification)<br><br>March 7, 2011 Supp. | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). | | | |
| | | March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command). | | | |
| | | March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols."). | | | |
| | | April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). | | | |
| | | Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
|  |  | Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network |  |  |  |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network servers communicating with storage using NLLBPs). | | | |
| **Claim 8:** | | | | | |
| The storage network of claim 7, wherein the access controls include an allocation of subsets of storage space to associated **workstations**, wherein each subset is only accessible by the associated workstation. | **Workstations:**<br><br>"A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:**<br><br>**Intrinsic:**<br><br>Col. 4, ll. 39-41 (specification defines workstation as a "computing device").<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); Microsoft Press | **Workstation:**<br><br>A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | *See claim 1, supra.* | "A computer having input/output devices intended for use by humans." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Computer Dictionary 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | | |
| The storage network of claim 7, wherein the **access controls** include an allocation of subsets of storage space to associated workstations, wherein each subset is only accessible by the associated workstation. | **Access control[s]:** "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Access control[s]:** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access controls" applies to shared storage). July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage). | **Access controls:** Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | *See claim 1, supra.* | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| **Claim 9:** | | | | | |
| The storage network of claim 7, wherein the storage devices comprise hard disk drives. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 10:** | | | | | |
| The storage network of claim 7, wherein the storage router comprises: a buffer providing memory work space for the storage router; a first controller operable to connect to and interface with the first transport medium, the first controller further operable to pull outgoing data from the buffer and to place incoming data into the buffer; a second controller operable to connect to and interface with the second transport medium, the second controller further operable to pull outgoing data from the buffer and to place incoming data into the buffer; and a supervisor unit coupled to the first | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("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 "). | **Device:** Computer. | *See claim 1, supra.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| 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, to implement the access controls for storage space on the storage devices and to process data in the buffer to interface between the first controller and the second controller to allow access from workstations to storage devices. | | Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). **Extrinsic:** April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | used in reference to peripherals such as printers, CRTS and disk drives"). <br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). <br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). <br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| 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, to **implement the access controls for storage space on the storage devices** and to process data in the buffer to interface between the first controller and the second controller to allow access from workstations to storage | **Implement the access controls for storage space on the storage devices:** "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Implement the access controls for storage space on the storage devices:** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access controls" applies to shared storage). | **Access controls:** Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | *See claim 1, supra.* | "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| devices. | | July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |
| 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, to implement the access controls for storage space on the storage devices and to process data in the buffer to interface between the first controller and the second controller to allow access from **workstations** to storage devices. | **Workstations:** "A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:** **Intrinsic:** Col. 4, ll. 39-41 (specification defines workstation as a "computing device"). **Extrinsic:** *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed | | | "A computer having input/output devices intended for use by humans." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | construction); <u>Microsoft Press Computer Dictionary</u> 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | | |
| **Claim 11:** | | | | | |
| A method for providing virtual local storage on remote storage devices connected to one transport medium to **devices** connected to another transport medium, comprising: | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("from the perspective of a workstation, or other computing device, seeking to access such server data, the access is much slower than access | **Device:** Computer. | *See claim 1, supra.* | No Construction Necessary. |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | to data on a local storage device "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices). April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| interfacing with a first transport medium; interfacing with a second transport medium; mapping between devices connected to the first transport medium and the storage devices and that **implements access controls for storage space on the storage devices**; and | **Implements access controls for storage space on the storage devices:** "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Implements access controls for storage space on the storage devices:** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access | **Access controls:** Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices | *See claim 1, supra.* | "Provides controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | controls" applies to shared storage).<br><br>July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |
| allowing access from devices connected to the first transport medium to the storage devices using native low level, block protocols. | Allowing access from devices . . . to the storage devices using native low level, block protocols:<br><br>"Permit or deny reading or writing of data using the NLLBP of the Virtual Local Storage without involving a translation from a high level file system command to a native low level, block protocol request." | Allowing access from devices . . . to the storage devices using native low level, block protocols:<br><br>Intrinsic:<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices). | Allowing access... to the storage devices using native low level, block protocols:<br><br>Permitting reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | See claim 1, supra. | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from <u>devices</u> connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Col. 4, ll. 7-47 (invention of patents-in-suit provides "virtual local storage" that appears to a workstation as local storage, and appears to have the same characteristics of local storage).<br><br>Col. 4, ll. 44-57 ("virtual local storage" is "provided" by the storage router in a manner that is transparent to the devices requesting storage access).<br><br>Col. 5, ll. 11-17, ll. 24- | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | 27 (supervisor unit within the storage router processes NLLBP requests from the devices to access permitted storage). Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access). Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37- | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | 39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 3, ll. 17-23 (the "network protocol" used by the prior art "network servers" to allow access to storage devices is a protocol that includes a high level file system command that must be translated into low level storage requests). April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | commands into low level commands in order to send the NLLBP to the storage devices). <br><br> April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶¶ 9-13 (data transfer in networks best understood as having layers; when TCP/IP and Ethernet protocols were used by prior art systems to transport high level network file system requests, a network server would | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | translate such requests into low level requests to access storage); ¶¶6-7 (prior art "server" described in patents-in-suit was specifically a device that allowed access between the device requesting "access to data" and the storage devices using something called a "network protocol"; such "servers" implemented file systems and received high level file system protocols from devices requesting data access). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br><br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network").<br><br>Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server"). Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶3 (a workstation gets "access to the local storage device through native low level block protocols").<br><br>Hr'g Tr. at 129:7-13, | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | March 8, 2011 (Defendants agreed to remove "without involving . . . Ethernet networks, Ethernet protocols, TCP/IP" from their proposed construction).March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶36 (NLLBP "used" by the storage router to allow access is the NLLBP sent to it from the device; this NLLBP is the NLLBP appropriate for the virtual local storage, not the NLLBP of the storage device storing the data).<br><br>Dictionary of Computer and Internet Terms 311 (6th Ed. 1996), Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. S (defining "native" as "1. designed for a specific hardware or software | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | environment (rather than for compatibility with something else)").<br><br>Stip. Defs. of Cl. Terms, Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. I (parties agree that "virtual local storage" is "storage space, in a storage device that is remotely connected to an initiator device to be within or locally connected to the initiator device").<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol). | | | |
| allowing access from devices connected to the first transport medium to the storage devices using **native low level, block protocols**. | **Native low level block protocol ("NLLBP"):**<br><br>**Native:**<br>"Designed for use with a specific type of storage device."<br><br>**Block Protocol:**<br>"A set of rules or | **Native low level block protocol:**<br><br>**Intrinsic:**<br><br>Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, | **Native low level block protocol:**<br><br>*Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:* | *See claim 1, supra.* | "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." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | standards for exchanging information with a block-oriented storage device." <br><br> **Low Level . . . Protocol:** <br> "A set of rules or standards that enable computers to exchange information without involving high level file system protocols." <br><br> Or, in the alternative: <br><br> **Native Low Level Block Protocol:** <br><br> "A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term). <br><br> Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server). <br><br> Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices). <br><br> Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium | **Native:** <br> Designed for use with a specific type of storage device. <br><br> **Low-level protocol:** <br> A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols. <br><br> **Block protocol:** <br> A set of rules or standards for exchanging information with a block-oriented storage device | | |

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| **Special Master's Proposed Construction of Disputed Terms** | | | | | |
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | NLLBPs do not involve overhead of high level network protocols or file systems). | | | |
| | | Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers). | | | |
| | | **Extrinsic:** | | | |
| | | March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art). | | | |
| | | Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification) | | | |
| | | March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols.").<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP).<br><br>Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network servers communicating with storage using | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | NLLBPs). | | | |
| **Claim 12:** | | | | | |
| The method of claim 11, wherein mapping between **devices** connected to the first transport medium and the storage devices includes allocating subsets of storage space to associated devices connected to the first transport medium, wherein each subset is only accessible by the associated device connected to the first transport medium. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, | **Device:** Computer. | *See claim 1, supra.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). | | | |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 13:** | | | | | |
| The method of claim 12, wherein the **devices** connected to the first transport medium comprise workstations. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("from the perspective of a | **Device:** Computer. | *See claim 1, supra.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | 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 "). <br><br> Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). <br><br> Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). <br><br> Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| The method of claim 12, wherein the devices connected to the first transport medium comprise **workstations**. | **Workstations:** "A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:** **Intrinsic:** Col. 4, ll. 39-41 (specification defines workstation as a "computing device"). **Extrinsic:** | **Workstation:** A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | *See claim 3, supra.* | "A computer having input/output devices intended for use by humans." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); Microsoft Press Computer Dictionary 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | | |
| **Claim 14:** | | | | | |
| The method of claim 12, wherein the storage devices comprise hard disk drives. | [No claim term at issue] | | [No claim term at issue] | | |

## TABLE OF CITATION ABBREVIATIONS

| Abbreviation | Document(s) | Date | Exhibit No. or Range |
|---|---|---|---|
| | **Joint Materials** | | |
| Hrg. Tr. | Transcript of *Markman* Hearing before the Honorable Karl Bayer, Jr. | 3/08/2011 | |
| Jt. Ex. | Markman Hearing Joint Exhibits | | Jt. Ex. 101-114 |
| | **Plaintiff's Pleadings and Exhibits** | | |
| Pl. Br. | Plaintiff Crossroads Systems Inc.'s Markman Brief | 2/22/2011 | |
| Pl. Br. Ex. | Exhibits to Declaration of Elizabeth Brown Fore dated 2/22/2011 (in support of Plaintiff's brief) | | A-FF |
| Levy Decl. | Declaration of John Levy, Ph.D. | 2/22/2011 | |
| Levy Ex. | Exhibits to Declaration of John Levy, Ph.D. | | A-F |
| Levy Supp. | Supplemental Declaration of John Levy, Ph.D. | 3/07/2011 | |
| Levy Supp. Ex. | Exhibits to Supplemental Declaration of John Levy, Ph.D. | | A-L |
| Pl. Hrg. Ex. | Crossroads' Markman Hearing Exhibits | | P-1 to P-37 |
| Pl. PHB | Plaintiff Crossroads Systems Inc.'s Post-Hearing Markman Brief | 4/29/2011 | |
| Pl. PHB Ex. | Exhibits to Declaration of Elizabeth Brown Fore dated 4/29/2011 (in support of Plaintiff's post-hearing brief) | | A-J |
| Levy 2nd Supp. | Second Supplemental Declaration of John Levy, Ph.D. | 4/28/2011 | |

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| Abbreviation | Document(s) | Date | Exhibit No. or Range |
|---|---|---|---|
| Levy 2nd Supp. Ex. | Exhibits to Supplemental Declaration of John Levy, Ph.D. | | A-D |
| Pl. RPHB | Plaintiff Crossroads Systems Inc.'s Reply Post-Hearing Brief | 5/13/2011 | |
| **Defendants' Pleadings and Exhibits** | | | |
| Def. Br. | Brief in Support of Defendants' Proposed Claim Constructions | 2/22/2011 | |
| Def. Ex. | Exhibits to Declaration of George W. Webb III (to accompany Defendants' brief) (also entered as Defendants' hearing exhibits) | 2/22/2011 | Def. Ex. 1-22 |
| Berg Decl. | Declaration of Brian A. Berg | 3/07/2011 | |
| Berg App. | Appendices to Declaration of Brian A. Berg | | Berg. App. A-J |
| Def. PHB | Defendants' Post-Hearing Brief on Issues of Claim Construction | 4/29/2011 | |
| Def. PHB Ex. | Exhibits to Declaration of George W. Webb III (to accompany Defendants' brief) | 4/29/2011 | Def. Ex. 23-24 |
| Def. RPHB | Defendants' Reply Post-Hearing Brief on Issues of Claim Construction | 5/13/2011 | |
| **Frequently Cited Documents** | | | |
| '035 patent | U.S. Pat. 6,425,035 | 7/23/2002 | Jt. Ex. 101 |
| '147 patent | U.S. Pat. 7,051,147 | 5/23/2006 | Jt. Ex. 102 |
| First Reexam Reply | '035 file history, Reply to Office Action Under *Ex Parte* Reexamination Dated 2/07/2005 | 4/06/2005 | Def. Ex. 6 |

| Abbreviation | Document(s) | Date | Exhibit No. or Range |
|---|---|---|---|
| Second Reexam Reply | '035 file history, Reply to Office Action Under *Ex Parte* Reexamination Dated 5/24/2005 | 7/22/2005 | Def. Ex. 7 |
| '147 Reply | '147 file history, Reply to Office Action Dated 1/27/2005 | 7/27/2005 | Def. Ex. 9 |
| Horst Decl. | Declaration of Robert W. Horst and exhibits in *Crossroads v. Postvision* (W.D. Tex. case 1:10-cv-00652-SS) | 5/20/2010 | Def. Ex. 16 |

## SPECIAL MASTER'S RECOMMENDED CONSTRUCTIONS
## PATENT NO. 7,051,147

| Term | Special Master's Recommended Construction |
| --- | --- |
| | |
| Device | No Construction Necessary. |
| Configuration | No Construction Necessary. |
| Access control(s) | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |
| Allow access …to the remote storage devices using native low level, block protocol. | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |
| Initiator Device | "A device that issues requests for data or storage." |
| Native low level block protocol (NLLBP) | "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." |
| Workstation | "A computer having input/output devices intended for use by humans." |
| Control Access | "To limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| United States Patent No. 7,051,147 | | | | | |
| **Claim 1:** | | | | | |
| A storage router for providing virtual local storage on remote storage devices to a **device**, comprising: a buffer providing memory work space for the storage router; a first Fibre Channel controller operable to connect to and interface with a first Fibre Channel transport medium; | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1,[1] Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 | **Device:**<br><br>Computer. | *See '035 patent, claim 1.*[2] | No Construction Necessary. |

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[1] United States Patent No. 6,425,035 ("the '035 Patent") and United States Patent No. 7,051,147 ("the '147 Patent") share a common specification. To facilitate cross-referencing, unless noted otherwise, all Col:Line cites in the charts of proposed claim constructions are to the '035 Patent.

[2] For this and other claim terms common to both the '035 and '147 patents, the parties have not identified any evidentiary issues that are different between the two patents. Therefore, for the sake of brevity and clarity, Defendants avoid repetition of issues addressed in detail in the '035 chart.

| | Special Master's Proposed Construction of Disputed Terms | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). **Extrinsic:** April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4$^{th}$ ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | such as printers, CRTS and disk drives"). <br><br> Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). <br><br> May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). <br><br> Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| a second Fibre Channel controller operable to connect to and interface with a second Fibre Channel transport medium; and a supervisor unit coupled to the first and second Fibre Channel controllers and the buffer, the supervisor unit operable: to maintain a **configuration** for remote storage devices connected to the second Fibre Channel transport medium that maps between the device and the remote storage devices and | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] | **Configuration:** "Map"; otherwise indefinite. | **Intrinsic Evidence** '147 patent claims 1, 9, 10, 34, 35 ("a configuration [...] that maps") '147 patent claims 15, 22, 29 ("a configuration wherein the configuration includes [the][a] map") 2:20-23[3] ("The configuration maps...") 4:13-16 5:50-53 | No Construction Necessary. |

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[3] As in the claim construction briefs previously submitted to the Court, all specification citations are to the '035 patent unless otherwise noted.

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| that implements access controls for storage space on the remote storage devices; | | access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| and a supervisor unit coupled to the first and second Fibre Channel controllers and the buffer, the supervisor unit operable: | **Access control(s):** "Controls which limit a device's access to a specific subset of storage devices or sections of a | **Access control(s):** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, | | *See '035 patent, claim 1.* | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| to maintain a configuration for remote storage devices connected to the second Fibre Channel transport medium that maps between the device and the remote storage devices and that implements **access controls** for storage space on the remote storage devices; | single storage device according to a map." | 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device).<br><br>Col. 4, ll. 7-11 ("access controls" applies to shared storage).<br><br>July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |
| and to process data in the buffer to interface between the first Fibre Channel controller and the second Fibre Channel controller to **allow access** from Fibre Channel initiator devices **to the remote storage devices using native low level, block protocol** in accordance with the configuration. | **Allow access . . . to the remote storage devices using native low level, block protocol:**<br><br>"Permit or deny reading or writing of data using the NLLBP of the Virtual Local Storage without involving a translation from a high level file system command to a native low level, block protocol request." | **Allow access . . . to the remote storage devices using native low level, block protocol:**<br><br>**Intrinsic:**<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the | **Allow access...to the remote storage devices using native low level, block protocol:**<br><br>Permit reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network protocols, network | *See '035 patent, claim 1.* | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from <u>devices</u> connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Col. 4, ll. 7-47 (invention of patents-in-suit provides "virtual local storage" that appears to a workstation as local storage, and appears to have the same characteristics of local storage).<br><br>Col. 4, ll. 44-57 ("virtual local storage" is "provided" by the storage router in a manner that is transparent to the | protocols or file system protocols, or translation from one protocol to another. | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | devices requesting storage access). Col. 5, ll. 11-17, ll. 24-27 (supervisor unit within the storage router processes NLLBP requests from the devices to access permitted storage). Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access). Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers). Col. 1, ll. 57-60 ("from the perspective of a workstation, or other computing device, seeking to access such server data, the access is much slower than access | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | to data on a local storage device "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 3, ll. 17-23 (the "network protocol" used by the prior art "network servers" to allow access to storage devices is a protocol that includes a high level file system command that must be translated into low level storage requests). April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶¶ 9-13 (data transfer in networks best understood as having layers; when TCP/IP and Ethernet protocols were used by prior art systems to transport high level network file system | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | requests, a network server would translate such requests into low level requests to access storage); ¶¶6-7 (prior art "server" described in patents-in-suit was specifically a device that allowed access between the device requesting "access to data" and the storage devices using something called a "network protocol"; such "servers" implemented file systems and received high level file system protocols from devices requesting data access).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | <u>Microsoft Computer Dictionary</u> 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). <br><br> Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). <br><br> Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). | | | |
| | | Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶3 (a workstation gets "access to the local storage device through native low level block protocols").<br><br>Hr'g Tr. at 129:7-13, March 8, 2011 (Defendants agreed to remove "without | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | involving . . . Ethernet networks, Ethernet protocols, TCP/IP" from their proposed construction).March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). | | | |
| | | February 22, 2011 Decl. of John Levy, Ph.D., ¶36 (NLLBP "used" by the storage router to allow access is the NLLBP sent to it from the device; this NLLBP is the NLLBP appropriate for the virtual local storage, not the NLLBP of the storage device storing the data). | | | |
| | | Dictionary of Computer and Internet Terms 311 (6th Ed. 1996), Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. S (defining "native" as "1. designed for a specific hardware or software environment (rather than for compatibility with something else)"). | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Stip. Defs. of Cl. Terms, Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. I (parties agree that "virtual local storage" is "storage space, in a storage device that is remotely connected to an initiator device to be within or locally connected to the initiator device"). <br><br> April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol). | | | |
| and to process data in the buffer to interface between the first Fibre Channel controller and the second Fibre Channel controller to allow access from Fibre Channel **initiator devices** to the remote storage devices using native low level, block | **Initiator Device:** <br><br> "A device that issues requests for data or storage." | **Initiator Device:** <br><br> **Intrinsic:** <br><br> Col. 3, ll. 41-43; Col. 6, ll. 19-57 (specification generically refers to "initiator device" as a device requesting access to a target device). | **Fibre Channel initiator device:** <br><br> A computer that issues a command on a Fibre Channel bus using Fibre Channel protocol. | **Extrinsic Evidence** <br><br> Def. Ex. 20, *Microsoft Computer Dictionary* (5th ed. 2002) at 273. <br><br> Pl. Hrg. Ex. P-17[4], *FC Protocol for SCSI* §§ 4-2 to 4-2. <br><br> *For proper construction* | "A device that issues requests for data or storage." |

[4] For the sake of clarity, commonly cited documents are referenced by the abbreviated names used in prior briefing. A table of these abbreviations was included in Defendant's Reply Post-Hearing Brief and is also appended at the end of this chart.

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| protocol in accordance with the configuration. | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L. (Crossroads' construction is the historic construction of term). | | *of "device" as "computer" see '035 patent, claim 1.* | |
| and to process data in the buffer to interface between the first Fibre Channel controller and the second Fibre Channel controller to allow access from Fibre Channel initiator devices to the remote storage devices using **native low level, block protocol** in accordance with the configuration. | **Native low level block protocol ("NLLBP"):**<br><br>**Native:**<br>"Designed for use with a specific type of storage device."<br><br>**Block Protocol:**<br>"A set of rules or standards for exchanging information with a block-oriented storage device."<br><br>**Low Level . . . Protocol:**<br>"A set of rules or standards that enable computers to exchange information without involving high level file system protocols."<br><br>Or, in the alternative:<br><br>**Native Low Level** | **Native low level block protocol:**<br><br>**Intrinsic:**<br><br>Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term).<br><br>Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server).<br><br>Fig. 1, Col. 1, ll. 49-54; | **Native low level block protocol:**<br><br>*Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:*<br><br>**Native:**<br>Designed for use with a specific type of storage device.<br><br>**Low-level protocol:**<br>A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system | *See '035 patent, claim 1.* | "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." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | **Block Protocol:**<br><br>"A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from <u>devices</u> connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used | protocols.<br><br>**Block protocol:**<br>A set of rules or standards for exchanging information with a block-oriented storage device | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments). | | | |
| | | Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks"). | | | |
| | | Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems). | | | |
| | | Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers). | | | |
| | | **Extrinsic:** | | | |
| | | March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | of art). | | | |
| | | Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification) | | | |
| | | March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). | | | |
| | | March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command). | | | |
| | | March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols."). | | | |
| | | April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network servers communicating with storage using NLLBPs). | | | |
| **Claim 2:** | | | | | |
| The storage router of claim 1, wherein the **configuration** maintained by the supervisor unit includes an allocation of subsets of storage space to associated Fibre Channel devices, wherein each subset is only accessible by the associated Fibre Channel device. | **Configuration:**<br><br>"A modifiable setting of information." | **Configuration:**<br><br>**Intrinsic:**<br><br>Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable).<br><br>'147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and | **Configuration:**<br><br>"Map"; otherwise indefinite. | *See claim 1, supra.* [5] | No Construction Necessary. |

[5] For this and other claim terms appearing in multiple claims, the parties have not identified any evidentiary issues that are different between different claims. Therefore, for the sake of brevity and clarity, Defendants avoid repetition of issues addressed in detail previously in this chart.

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| The storage router of claim 1, wherein the configuration maintained | **Device:** "Computing device that | **Device:** **Intrinsic:** | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| by the supervisor unit includes an allocation of subsets of storage space to associated Fibre Channel **devices**, wherein each subset is only accessible by the associated Fibre Channel device. | issues storage access requests." | Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | different servers or workstations into a storage network"). | | | |
| **Claim 3:** | | | | | |
| The storage router of claim 2, wherein the Fibre Channel **devices** comprise workstations. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). **Extrinsic:** April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4$^{th}$ ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | such as printers, CRTS and disk drives"). <br><br> Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). <br><br> May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). <br><br> <u>Microsoft Computer Dictionary</u> 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| The storage router of claim 2, wherein the Fibre Channel devices comprise **workstations**. | **Workstations:** "A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:** **Intrinsic:** Col. 4, ll. 39-41 (specification defines workstation as a "computing device"). **Extrinsic:** *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* | **Workstation:** A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | *See '035 patent, claim 3.* | "A computer having input/output devices intended for use by humans." |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | litigation adopted Crossroads' proposed construction); Microsoft Press Computer Dictionary 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | | |
| **Claim 4:** | | | | | |
| The storage router of claim 2, wherein the remote storage devices comprise hard disk drives. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 5:** | | | | | |
| The storage router of claim 1, wherein each of the first Fibre Channel controller comprises:<br>a Fibre Channel (FC) protocol unit operable to connect to the Fibre Channel transport medium;<br>a first-in-first-out queue coupled to the Fibre Channel protocol unit; and<br>a direct memory access (DMA) interface coupled to the first-in-first-out queue and to the buffer. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 6:** | | | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| A storage network, comprising: a first Fibre Channel transport medium; a second Fibre Channel transport medium; a plurality of **workstations** connected to the first Fibre Channel transport medium; a plurality of storage devices connected to the second Fibre Channel transport medium; and a plurality of workstations connected to the first Fibre Channel transport medium; a plurality of storage devices connected to the second Fibre Channel transport medium; and | **Workstations:**<br><br>"A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:**<br><br>**Intrinsic:**<br><br>Col. 4, ll. 39-41 (specification defines workstation as a "computing device").<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); <u>Microsoft Press Computer Dictionary</u> 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | **Workstation:**<br><br>A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | *See '035 patent, claim 3.* | "A computer which has human input/output devices." (?) |
| a storage router interfacing between the first Fibre Channel | **Access control(s):**<br><br>"Controls which limit a | **Access control(s):**<br><br>**Intrinsic:** | **Access controls:**<br><br>Controls that use a map | *See '035 patent, claim 1.* | "Controls which limit a device's access to a specific subset of storage |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| transport medium and the second Fibre Channel transport medium, the storage router providing virtual local storage on the storage devices to the workstations and operable:<br>to map between the workstations and the storage devices;<br>to implement **access controls** for storage space on the storage devices; and | device's access to a specific subset of storage devices or sections of a single storage device according to a map." | Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device).<br><br>Col. 4, ll. 7-11 ("access controls" applies to shared storage).<br><br>July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for | to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | | devices or sections of a single storage device according to a map." |

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| | | an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |
| to **allow access** from the workstations **to the storage devices using native low level, block protocol** in accordance with the mapping and access controls. | **Allow access...to the storage devices using native low level, block protocol:**<br><br>"Permit or deny reading or writing of data using the NLLBP of the Virtual Local Storage without involving a translation from a high level file system command to a native low level, block protocol | **Allow access . . . to the storage devices using native low level, block protocol:**<br><br>**Intrinsic:**<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by | **Allow access...to the storage devices using native low level, block protocol:**<br><br>Permit reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols such as | *See '035 patent, claim 1.* | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | request." | translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Col. 4, ll. 7-47 (invention of patents-in-suit provides "virtual local storage" that appears to a workstation as local storage, and appears to have the same characteristics of local storage).<br><br>Col. 4, ll. 44-57 ("virtual local storage" is "provided" by the storage router in a | TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | manner that is transparent to the devices requesting storage access). Col. 5, ll. 11-17, ll. 24-27 (supervisor unit within the storage router processes NLLBP requests from the devices to access permitted storage). Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access). Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers). Col. 1, ll. 57-60 ("from the perspective of a workstation, or other computing device, seeking to access such | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
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| | | server data, the access is much slower than access to data on a local storage device "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 3, ll. 17-23 (the "network protocol" used by the prior art "network servers" to allow access to storage devices is a protocol that includes a high level file system command that must be translated into low level storage requests). April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | storage device, not the use of Ethernet networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶¶ 9-13 (data transfer in networks best understood as having layers; when TCP/IP and Ethernet protocols were used by prior art systems | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | to transport high level network file system requests, a network server would translate such requests into low level requests to access storage); ¶¶6-7 (prior art "server" described in patents-in-suit was specifically a device that allowed access between the device requesting "access to data" and the storage devices using something called a "network protocol"; such "servers" implemented file systems and received high level file system protocols from devices requesting data access). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server"). <br><br> Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). <br><br> Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶3 (a workstation gets "access to the local storage device through native low level block protocols").<br><br>Hr'g Tr. at 129:7-13, March 8, 2011 | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | (Defendants agreed to remove "without involving . . . Ethernet networks, Ethernet protocols, TCP/IP" from their proposed construction).March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶36 (NLLBP "used" by the storage router to allow access is the NLLBP sent to it from the device; this NLLBP is the NLLBP appropriate for the virtual local storage, not the NLLBP of the storage device storing the data).<br><br>Dictionary of Computer and Internet Terms 311 (6th Ed. 1996), Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. S (defining "native" as "1. designed for a specific hardware or software environment (rather than for compatibility with | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | something else)"). Stip. Defs. of Cl. Terms, Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. I (parties agree that "virtual local storage" is "storage space, in a storage device that is remotely connected to an initiator device to be within or locally connected to the initiator device"). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol). | | | |
| to allow access from the workstations to the storage devices using **native low level, block protocol** in accordance with the mapping and access controls. | **Native low level block protocol ("NLLBP"):** **Native:** "Designed for use with a specific type of storage device." **Block Protocol:** "A set of rules or standards for exchanging information with a | **Native low level block protocol:** **Intrinsic:** Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 | **Native low level block protocol:** *Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:* **Native:** Designed for use with a | *See '035 patent, claim 1.* | "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." |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | block-oriented storage device." <br><br> **Low Level . . . Protocol:** <br> "A set of rules or standards that enable computers to exchange information without involving high level file system protocols." <br><br> Or, in the alternative: <br><br> **Native Low Level Block Protocol:** <br><br> "A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | (specification consistently uses "NLLBP" as a single term). <br><br> Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server). <br><br> Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices). <br><br> Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from <u>devices</u> connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis | specific type of storage device. <br><br> **Low-level protocol:** <br> A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols. <br><br> **Block protocol:** <br> A set of rules or standards for exchanging information with a block-oriented storage device | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices). April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems). | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers).<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art).<br><br>Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification)<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages).<br><br>March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command).<br><br>March 7, 2011 Decl. of | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols."). | | | |
| | | April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). | | | |
| | | Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.") <br><br> April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols). | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network servers communicating with storage using NLLBPs). | | | |
| **Claim 7:** | | | | | |
| The storage network of claim 6, wherein the **access controls** include an allocation of subsets of storage space to | **Access control(s):**<br><br>"Controls which limit a device's access to a specific subset of storage | **Access control(s):**<br><br>**Intrinsic:**<br><br>Fig. 3, Col. 3, ll. 7-59, | **Access controls:**<br><br>Controls that use a map to permit a particular device to read data from | *See '035 patent, claim 1.* | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| associated workstations, wherein each subset is only accessible by the associated workstation. | devices or sections of a single storage device according to a map." | Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). <br><br> Col. 4, ll. 7-11 ("access controls" applies to shared storage). <br><br> July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage). <br><br> **Extrinsic:** <br><br> *Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared | or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | | according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |
| The storage network of claim 6, wherein the access controls include an allocation of subsets of storage space to associated **workstations**, wherein each subset is only accessible by the associated workstation. | **Workstations:**<br><br>"A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:**<br><br>**Intrinsic:**<br><br>Col. 4, ll. 39-41 (specification defines workstation as a "computing device").<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' | **Workstation:**<br><br>A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | *See '035 patent, claim 3.* | "A computer having input/output devices intended for use by humans." |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); Microsoft Press Computer Dictionary 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | | |
| **Claim 8:** | | | | | |
| The storage network of claim 6, wherein the storage devices comprise hard disk drives. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 9:** | | | | | |
| The storage network of claim 6, wherein the storage router comprises: a buffer providing memory work space for the storage router; a first Fibre Channel controller operable to connect to and interface with the first Fibre Channel | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). | **Configuration:** "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| transport medium, the first Fibre Channel controller further operable to pull outgoing data from the buffer and to place incoming data into the buffer; a second Fibre Channel controller operable to connect to and interface with the second Fibre Channel transport medium, the second Fibre Channel controller further operable to pull outgoing data from the buffer and to place incoming data into the buffer; and a supervisor unit coupled to the first and second Fibre Channel controllers and the buffer, the supervisor unit operable: to maintain a **configuration** for the storage devices that maps between workstations and storage devices and that implements the access controls for storage space on the storage devices; and | | '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| to process data in the buffer to interface between the first Fibre Channel controller and the second Fibre Channel controller to allow access from workstations to storage devices in accordance with the configuration. | | configuration" to mean "keeping a modifiable set of information"). | | | |
| a supervisor unit coupled to the first and second Fibre Channel controllers and the buffer, the supervisor unit operable:<br>to maintain a configuration for the storage devices that maps between **workstations** and storage devices and that implements the access controls for storage space on the storage devices; and<br>to process data in the buffer to interface between the first Fibre Channel controller and the second Fibre Channel controller to allow access from workstations to storage devices in accordance with the configuration. | **Workstations:**<br><br>"A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Workstations:**<br><br>**Intrinsic:**<br><br>Col. 4, ll. 39-41 (specification defines workstation as a "computing device").<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); Microsoft | **Workstation:**<br><br>A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | *See '035 patent, claim 3.* | "A computer having input/output devices intended for use by humans." |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Press Computer Dictionary 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | | | |
| a supervisor unit coupled to the first and second Fibre Channel controllers and the buffer, the supervisor unit operable: to maintain a configuration for the storage devices that maps between workstations and storage devices and that implements the **access controls** for storage space on the storage devices; and to process data in the buffer to interface between the first Fibre Channel controller and the second Fibre Channel controller to allow access from workstations to storage devices in accordance with the configuration. | **Access control(s):** "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Access control(s):** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access controls" applies to shared storage). July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage). | **Access controls:** Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | *See '035 patent, claim 1.* | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| **Claim 10:** | | | | | |
| A method for providing virtual local storage on remote storage devices to Fibre Channel devices, comprising: interfacing with a first Fibre Channel transport medium; interfacing with a second Fibre Channel transport medium; maintaining a **configuration** for remote storage devices connected to the second Fibre Channel transport medium that maps between Fibre Channel devices and the remote storage devices and that implements access controls for storage space on the remote storage devices; and | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** *Chaparral* Markman | **Configuration:** "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| A method for providing virtual local storage on remote storage devices to Fibre Channel devices, comprising: interfacing with a first Fibre Channel transport medium; interfacing with a second Fibre Channel transport medium; maintaining a configuration for remote storage devices connected to the second Fibre Channel transport medium that maps between Fibre Channel **devices** and the remote storage devices and that | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("from | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| implements access controls for storage space on the remote storage devices; and | | 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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | devices). April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). **Extrinsic:** April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| A method for providing virtual local storage on remote storage devices to Fibre Channel devices, comprising: interfacing with a first Fibre Channel transport medium; interfacing with a second Fibre Channel transport medium; maintaining a configuration for remote storage devices | **Access control(s):** "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Access control(s):** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access controls" applies to | **Access controls:** Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | *See '035 patent, claim 1.* | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| connected to the second Fibre Channel transport medium that maps between Fibre Channel devices and the remote storage devices and that implements **access controls** for storage space on the remote storage devices; and | | shared storage).<br><br>July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |
| allowing access from Fibre Channel initiator devices to the remote storage devices using native low level, block protocol in accordance with the configuration. | Allow access...to the remote storage devices using native low level, block protocol:<br><br>"Permit or deny reading or writing of data using the NLLBP of the Virtual Local Storage without involving a translation from a high level file system command to a native low level, block protocol request." | Allow access . . . to the remote storage devices using native low level, block protocol:<br><br>Intrinsic:<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices | Allow access...to the remote storage devices using native low level, block protocol:<br><br>Permit reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | *See '035 patent, claim 1.* | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access). <br><br> Col. 4, ll. 7-47 (invention of patents-in-suit provides "virtual local storage" that appears to a workstation as local storage, and appears to have the same characteristics of local storage). <br><br> Col. 4, ll. 44-57 ("virtual local storage" is "provided" by the storage router in a manner that is transparent to the devices requesting storage access). <br><br> Col. 5, ll. 11-17, ll. 24-27 (supervisor unit within the storage router processes NLLBP requests from the devices to access | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | permitted storage). <br><br> Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access). <br><br> Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers). <br><br> Col. 1, ll. 57-60 ("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 "). <br><br> Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | "workstations").<br><br>Col. 3, ll. 17-23 (the "network protocol" used by the prior art "network servers" to allow access to storage devices is a protocol that includes a high level file system command that must be translated into low level storage requests).<br><br>April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). <br><br> Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶¶ 9-13 (data transfer in networks best understood as having layers; when TCP/IP and Ethernet protocols were used by prior art systems to transport high level network file system requests, a network server would translate such requests into low level requests to access storage); ¶¶6-7 (prior art "server" described in patents-in-suit was specifically a device that allowed access between | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | the device requesting "access to data" and the storage devices using something called a "network protocol"; such "servers" implemented file systems and received high level file system protocols from devices requesting data access).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 | | | |

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| **Special Master's Proposed Construction of Disputed Terms** | | | | | |
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server"). | | | |
| | | Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). | | | |
| | | Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol | | | |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | request.") April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols). March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶3 (a workstation gets "access to the local storage device through native low level block protocols"). Hr'g Tr. at 129:7-13, March 8, 2011 (Defendants agreed to remove "without involving . . . Ethernet networks, Ethernet protocols, TCP/IP" from their proposed construction).March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | only with delivery of messages).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶36 (NLLBP "used" by the storage router to allow access is the NLLBP sent to it from the device; this NLLBP is the NLLBP appropriate for the virtual local storage, not the NLLBP of the storage device storing the data).<br><br>Dictionary of Computer and Internet Terms 311 (6th Ed. 1996), Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. S (defining "native" as "1. designed for a specific hardware or software environment (rather than for compatibility with something else)").<br><br>Stip. Defs. of Cl. Terms, Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. I (parties agree that "virtual local storage" is "storage space, in a storage device that is remotely connected to an initiator device to be | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | within or locally connected to the initiator device"). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol). | | | |
| allowing access from Fibre Channel **initiator devices** to the remote storage devices using native low level, block protocol in accordance with the configuration. | **Initiator Device:** "A device that issues requests for data or storage." | **Initiator Device:** **Intrinsic:** Col. 3, ll. 41-43; Col. 6, ll. 19-57 (specification generically refers to "initiator device" as a device requesting access to a target device). **Extrinsic:** *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L. (Crossroads' construction is the historic construction of term). | **Fibre Channel initiator device:** A computer that issues a command on a Fibre Channel bus using Fibre Channel protocol. | *See claim 1, supra.* | "A device that issues requests for data or storage." |
| allowing access from Fibre Channel initiator | **Native low level block protocol ("NLLBP"):** | **Native low level block protocol:** | **Native low level block protocol:** | *See '035 patent, claim 1.* | "A set of rules or standards that enable |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| devices to the remote storage devices **using native low level, block protocol** in accordance with the configuration. | **Native:** "Designed for use with a specific type of storage device." | **Intrinsic:** | *Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:* | | computers to exchange information and do not involve the overhead of high level protocols and file systems typically required by network servers." |
| | | Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term). | **Native:** Designed for use with a specific type of storage device. | | |
| | **Block Protocol:** "A set of rules or standards for exchanging information with a block-oriented storage device." | | | | |
| | **Low Level ... Protocol:** "A set of rules or standards that enable computers to exchange information without involving high level file system protocols." | Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server). | **Low-level protocol:** A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols. | | |
| | Or, in the alternative: | Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical | | | |
| | **Native Low Level Block Protocol:** "A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | | **Block protocol:** A set of rules or standards for exchanging information with a block-oriented storage device | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from <u>devices</u> connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>April 6, 2005 Reply to | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices). April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments). Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | based networks"). Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems). Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers). **Extrinsic:** March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art). Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification) March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | TCP/IP protocols are concerned only with delivery of messages).<br><br>March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols.").<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP).<br><br>Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server"). Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the | | | |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | servers communicating with storage using NLLBPs). | | | |
| **Claim 11:** | | | | | |
| The method of claim 10, wherein maintaining the **configuration** includes allocating subsets of storage space to associated Fibre Channel devices, wherein each subset is only accessible by the associated Fibre Channel device. | **Configuration:**<br><br>"A modifiable setting of information." | **Configuration:**<br><br>**Intrinsic:**<br><br>Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable).<br><br>'147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls").<br><br>Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). | **Configuration:**<br><br>"Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| The method of claim 10, wherein maintaining the configuration includes allocating subsets of storage space to associated Fibre Channel **devices**, wherein each subset is only accessible by the associated Fibre Channel device. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | storage devices as "computing devices"). | | | |
| | | Col. 1, ll. 57-60 ("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 "). | | | |
| | | Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). | | | |
| | | Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). | | | |
| | | Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4<sup>th</sup> ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 12:** | | | | | |
| The method of claim 11, wherein the Fibre Channel **devices** comprise workstations. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21- | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | 24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network | | | |

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|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| The method of claim 11, wherein the Fibre | **Workstations:** | **Workstations:** | **Workstation:** | *See '035 patent, claim 3.* | "A computer having input/output devices |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| Channel devices comprise **workstations**. | "A remote computing device that connects to the first (Fibre Channel) transport medium, and may consist of a personal computer." | **Intrinsic:**<br><br>Col. 4, ll. 39-41 (specification defines workstation as a "computing device").<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction consistent with historic construction); *Dot Hill* Stipulated Definitions of Claim Terms at 2, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. M (parties in *Dot Hill* litigation adopted Crossroads' proposed construction); Microsoft Press Computer Dictionary 368 (1991), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. Z ("workstation" is understood to be a broad term in the art). | A computer including human input/output devices such as a display and keyboard and designed for use by one person at a time. | | intended for use by humans." |
| **Claim 13:** | | | | | |
| The method of claim 11, wherein the remote storage devices comprise | [No claim term at issue] | | [No claim term at issue] | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| hard disk drives. | | | | | |
| **Claim 14:** | | | | | |
| An apparatus for providing virtual local storage on a remote storage device to a **device** operating according to a Fibre Channel protocol, comprising: | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices). April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24- | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | 203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). <br><br> May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). <br><br> Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). <br> Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| a first controller operable to connect to and interface with a first transport medium, wherein the first transport medium is operable according to the Fibre Channel protocol; a second controller operable to connect to and interface with a second transport medium, wherein the second transport medium is operable according to the Fibre Channel protocol; and a supervisor unit coupled to the first controller and the second controller, the supervisor unit operable to **control access** from the device connected to the first transport medium to the remote storage | **Control access:** "To limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Control access:** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access controls" applies to shared storage). July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to shared storage). | **Control access:** Use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. **...access...to the remote storage device...using native low level, block protocols:** Reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols | *See '035 patent, claim 1.* *See "allow[ing] access...using native low level, block protocol" at '035 patent, claim 1.* | "To limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| device connected to the second transport medium using native low level, block protocols according to a map between the device and the remote storage device. | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | such as TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | | |
| a supervisor unit coupled to the first controller and the second | **Native low level block protocol ("NLLBP"):** | **Native low level block protocol:** | **Native low level block protocol:** | *See '035 patent, claim 1.* | "A set of rules or standards that enable computers to exchange |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| controller, the supervisor unit operable to control access from the device connected to the first transport medium to the remote storage device connected to the second transport medium using **native low level, block protocols** according to a map between the device and the remote storage device. | **Native:** "Designed for use with a specific type of storage device." **Block Protocol:** "A set of rules or standards for exchanging information with a block-oriented storage device." **Low Level . . . Protocol:** "A set of rules or standards that enable computers to exchange information without involving high level file system protocols." Or, in the alternative: **Native Low Level Block Protocol:** "A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | **Intrinsic:** Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term). Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server). Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices). | *Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:* **Native:** Designed for use with a specific type of storage device. **Low-level protocol:** A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols. **Block protocol:** A set of rules or standards for exchanging information with a block-oriented storage device | | information and do not involve the overhead of high level protocols and file systems typically required by network servers." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>April 6, 2005 Reply to Office Action at 10-11, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices).<br><br>April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br.; Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments). Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems). Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers). **Extrinsic:** March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art). Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification) March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | concerned only with delivery of messages). March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command). March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols."). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network servers communicating | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | with storage using NLLBPs). | | | |
| **Claim 15** | | | | | |
| The apparatus of claim 14, wherein the supervisor unit is further operable to maintain a **configuration** wherein the configuration includes the map between the device and the remote storage device, and further wherein the map includes virtual LUNs that provide a representation of the storage device. | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). | **Configuration:** "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| The apparatus of claim 14, wherein the supervisor unit is further operable to maintain a configuration wherein the configuration includes the map between the **device** and the remote storage device, and further wherein the map includes virtual LUNs that provide a representation of the storage device. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | "computing devices"). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4$^{th}$ ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 16:** | | | | | |
| The apparatus of claim 15, wherein the map only exposes the **device** to LUNs that the device may access. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | devices). | | | |
| | | Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). | | | |
| | | Col. 1, ll. 57-60 ("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."). | | | |
| | | Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). | | | |
| | | Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). | | | |
| | | Abstract, Col. 1, ll. 21- | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
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| | | 24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| **Claim 17:** | | | | | |
| The apparatus of claim 14, wherein the supervisor unit is further operable to maintain a **configuration** including the map, wherein the map provides a mapping from a host device ID to a virtual LUN representation of the remote storage device to a physical LUN of the remote storage device. | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** *Chaparral* Markman | **Configuration:** "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| **Claim 18:** | | | | | |
| The apparatus of claim 14, wherein the remote storage device further comprises storage space partitioned into virtual local storage for the **device** connected to the first transport medium. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 19:** | | | | | |
| The apparatus of claim 18, wherein the supervisor unit is further operable to prevent the **device** from accessing any storage on the remote storage device that is not part of a virtual local storage partition assigned to the device. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38- | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | 42, ll. 55-56 Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, Dot Hill Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 20:** | | | | | |
| The apparatus of claim 14, wherein the first controller and the second controller further | [No claim term at issue] | | [No claim term at issue] | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| comprise a single controller. | | | | | |
| **Claim 21:** | | | | | |
| A system for providing virtual local storage on remote storage devices, comprising: a first controller operable to connect to and interface with a first transport medium operable according to a Fibre Channel protocol; a second controller operable to connect to and interface with a second transport medium operable according to the Fibre Channel protocol; at least one **device** connected to the first transport medium; at least one storage device connected to the second transport medium; and | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F | | | |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). **Extrinsic:** April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| an access control device coupled to the first controller and the second controller, the access control device operable to: map between the at least one device and a storage space on the at least one storage device; and **control access** from the at least one device to the at least one storage device using native low level, block protocol in accordance with the map. | **Control access:** "To limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Control access:** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access controls" applies to shared storage). July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple devices to have access to | **Control access:** Use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. **...access from the at least one device to the at least one storage device using native low level, block protocol:** Reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, | *See '035 patent, claim 1.* *See "allow access [ing]...using native low level, block protocol" at '035 patent, claim 1.* | "To limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | | |
| an access control device coupled to the first | **Native low level block protocol ("NLLBP"):** | **Native low level block protocol:** | **Native low level block protocol:** | *See '035 patent, claim 1.* | "A set of rules or standards that enable |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| controller and the second controller, the access control device operable to: map between the at least one device and a storage space on the at least one storage device; and control access from the at least one device to the at least one storage device using **native low level, block protocol** in accordance with the map. | **Native:** "Designed for use with a specific type of storage device." <br><br> **Block Protocol:** "A set of rules or standards for exchanging information with a block-oriented storage device." <br><br> **Low Level . . . Protocol:** "A set of rules or standards that enable computers to exchange information without involving high level file system protocols." <br><br> Or, in the alternative: <br><br> **Native Low Level Block Protocol:** <br><br> "A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | **Intrinsic:** <br><br> Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term). <br><br> Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server). <br><br> Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical | *Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:* <br><br> **Native:** Designed for use with a specific type of storage device. <br><br> **Low-level protocol:** A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols. <br><br> **Block protocol:** A set of rules or standards for exchanging information with a block-oriented storage device | | computers to exchange information and do not involve the overhead of high level protocols and file systems typically required by network servers." |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>April 6, 2005 Reply to | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices). | | | |
| | | April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | based networks"). Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems). Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers). **Extrinsic:** March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art). Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification) March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | TCP/IP protocols are concerned only with delivery of messages).<br><br>March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols.").<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP).<br><br>Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)).<br><br>Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | command to a native low level block protocol request.") | | | |
| | | April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols). | | | |
| | | March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel). | | | |
| | | April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol). | | | |
| | | February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | servers communicating with storage using NLLBPs). | | | |
| **Claim 22:** | | | | | |
| The system of claim 21, wherein the access control device is further operable to maintain a **configuration** wherein the configuration includes the map between the at least one device and the at least one storage device, and further wherein the map includes virtual LUNs that provide a representation of the at least one storage device. | **Configuration:**<br><br>"A modifiable setting of information." | **Configuration:**<br><br>**Intrinsic:**<br><br>Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable).<br><br>'147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls").<br><br>Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). | **Configuration:**<br><br>"Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | **Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| The system of claim 21, wherein the access control device is further operable to maintain a configuration wherein the configuration includes the map between the at least one device and the at least one storage device, and further wherein the map includes virtual LUNs that provide a representation of the at least one storage **device**. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | storage devices as "computing devices"). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | devices such as workstations, input/output devices, "initiator" and "target" devices). <br><br> April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). <br><br> **Extrinsic:** <br><br> April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4$^{th}$ ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 23:** | | | | | |
| The system of claim 22, wherein the map only exposes the at least one device to LUNs that the at least one **device** may access. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary . |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21- | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | 24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| **Claim 24:** | | | | | |
| The system of claim 21, wherein the access control device is further operable to maintain a **configuration** including the map, wherein the map provides a mapping from a host device ID to a virtual LUN representation of the at least one storage device to a physical LUN of the at least one storage device. | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** *Chaparral* Markman | **Configuration:** "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| **Claim 25:** | | | | | |
| The system of claim 21, wherein the at least one storage device further comprises storage space partitioned into virtual local storage for the at least one **device**. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
|  |  | network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). |  |  |  |
| **Claim 26:** | | | | | |
| The system of claim 25, wherein the access control unit is further operable to prevent at least one device from accessing any storage on the at least one storage device that is not part of a virtual local storage partition assigned to the at least one **device**. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38- | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | 42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 27:** | | | | | |
| The system of claim 21, wherein the first controller and the second controller further | [No claim term at issue] | | [No claim term at issue] | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| comprise a single controller. | | | | | |
| **Claim 28:** | | | | | |
| A method for providing virtual local storage on remote storage devices, comprising: mapping between a **device** connected to a first transport medium and a storage device connected to a second transport medium, wherein the first transport medium and the second transport medium operate according to a Fibre Channel protocol; | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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|---|---|---|---|---|---|
| **Special Master's Proposed Construction of Disputed Terms** | | | | | |
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices). April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). **Extrinsic:** April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| implementing **access controls** for storage space on the storage device; and | **Access control(s):**<br><br>"Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Access control(s):**<br><br>**Intrinsic:**<br><br>Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device).<br><br>Col. 4, ll. 7-11 ("access controls" applies to shared storage).<br><br>July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature includes the concept of allowing multiple | **Access controls:**<br><br>Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. | *See '035 patent, claim 1.* | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior prosecution history."). | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| **allowing access** from the device connected to the first transport medium **to the storage device using native low level, block protocols.** | **Allowing access …to the storage device using native low level, block protocols:**<br><br>"Permit or deny reading or writing of data using the NLLBP of the Virtual Local Storage without involving a translation from a high level file system command to a native low level, block protocol request." | **Allowing access . . . to the storage device using native low level, block protocols:**<br><br>**Intrinsic:**<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from <u>devices</u> connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access). | **Allowing access…to the storage devices using native low level, block protocols:**<br><br>Permitting reading and writing of data in the native low level, block protocol of the storage device, without involving network servers, Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | *See '035 patent, claim 1.* | "Permit or deny access using the NLLBP of the Virtual Local Storage without involving a translation from high level network protocols or file system protocols to a native low level block protocol request." |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Col. 4, ll. 7-47 (invention of patents-in-suit provides "virtual local storage" that appears to a workstation as local storage, and appears to have the same characteristics of local storage). Col. 4, ll. 44-57 ("virtual local storage" is "provided" by the storage router in a manner that is transparent to the devices requesting storage access). Col. 5, ll. 11-17, ll. 24-27 (supervisor unit within the storage router processes NLLBP requests from the devices to access permitted storage). Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are servers).<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 3, ll. 17-23 (the "network protocol" used by the prior art "network servers" to allow access to storage devices is a protocol that includes a high level file system command that must be translated into low level storage requests). | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices). <br><br> April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make a sweeping disclaimer of | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments).<br><br>Col. 5, ll. 53-56 (Fibre Channel is a protocol | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | used for communications over "Fibre Channel based networks"). **Extrinsic:** March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶¶ 9-13 (data transfer in networks best understood as having layers; when TCP/IP and Ethernet protocols were used by prior art systems to transport high level network file system requests, a network server would translate such requests into low level requests to access storage); ¶¶6-7 (prior art "server" described in patents-in-suit was specifically a device that allowed access between the device requesting "access to data" and the storage devices using something called a "network protocol"; such "servers" implemented file systems and received high level file system protocols from devices requesting data access). April 28, 2011 2d Supp. | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). <br><br> Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server"). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")

April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).

March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶3 (a workstation gets "access to the local storage device through native low level block protocols").<br><br>Hr'g Tr. at 129:7-13, March 8, 2011 (Defendants agreed to remove "without involving . . . Ethernet networks, Ethernet protocols, TCP/IP" from their proposed construction).March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶36 (NLLBP "used" by the storage router to allow access is the NLLBP sent to it from the device; this NLLBP is the NLLBP appropriate for the virtual local | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | storage, not the NLLBP of the storage device storing the data). <br><br> Dictionary of Computer and Internet Terms 311 (6<sup>th</sup> Ed. 1996), Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. S (defining "native" as "1. designed for a specific hardware or software environment (rather than for compatibility with something else)"). <br><br> Stip. Defs. of Cl. Terms, Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. I (parties agree that "virtual local storage" is "storage space, in a storage device that is remotely connected to an initiator device to be within or locally connected to the initiator device"). <br><br> April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | be a network protocol). | | | |
| allowing access from the device connected to the first transport medium to the storage device using **native low level, block protocols**. | **Native low level block protocol ("NLLBP"):**<br><br>**Native:**<br>"Designed for use with a specific type of storage device."<br><br>**Block Protocol:**<br>"A set of rules or standards for exchanging information with a block-oriented storage device."<br><br>**Low Level . . . Protocol:**<br>"A set of rules or standards that enable computers to exchange information without involving high level file system protocols."<br><br>Or, in the alternative:<br><br>**Native Low Level Block Protocol:**<br><br>"A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file | **Native low level block protocol:**<br><br>**Intrinsic:**<br><br>Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term).<br><br>Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server).<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the | **Native low level block protocol:**<br><br>*Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows*<br><br>**Native:**<br>Designed for use with a specific type of storage device.<br><br>**Low-level protocol:**<br>A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols.<br><br>**Block protocol:**<br>A set of rules or standards for exchanging information with a block-oriented storage device | *See '035 patent, claim 1.* | "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." |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | system protocols." | "network protocol" into low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from devices connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage | | | |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | access request are servers). <br><br> April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices). <br><br> April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Crossroads did not make a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP).<br><br>Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Col. 5, ll. 53-56 (Fibre Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems).<br><br>Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers).<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art).<br><br>Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification) | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command). March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols."). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Cl. Const. Br., Ex. J) the workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server"). Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). | | | |

| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | protocols" is superfluous to "without involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | of higher level protocols to access storage); *Id.* ¶ 34 (specification describes network servers communicating with storage using NLLBPs). | | | |
| **Claim 29:** | | | | | |
| The method of claim 28, further comprising **maintaining a configuration** wherein the configuration includes a map between the device and the one storage device, and further wherein the map includes virtual LUNs that provide a representation of the storage device. | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration | **Configuration:** "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | includes a map. . ." would be meaningless under Defendants' proposed construction).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| The method of claim 28, further comprising maintaining a configuration wherein the configuration includes a map between the **device** and the one storage device, and further wherein the map includes virtual LUNs that provide a representation of the storage device. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices).<br><br>Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56 Col. 6, ll. | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, | | | |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests).<br><br>May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 30:** | | | | | |
| The method of claim 29, wherein the map only exposes the **device** to LUNs that the device may access. | **Device:**<br><br>"Computing device that issues storage access requests." | **Device:**<br><br>**Intrinsic:**<br><br>Claim 1, Col. 9, ll. 27-30 | **Device:**<br><br>Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices"). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage). | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | **Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP).<br><br>The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4$^{th}$ ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives").<br><br>Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | storage network"). | | | |
| **Claim 31:** | | | | | |
| The method of claim 28, further comprising maintaining a **configuration** including a map from a host device ID to a virtual LUN representation of the storage device to a physical LUN of the storage device. | **Configuration:** "A modifiable setting of information." | **Configuration:** **Intrinsic:** Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** | **Configuration:** "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| **Claim 32:** | | | | | |
| The method of claim 28, further comprising partitioning storage space on the storage device into virtual local storage for the **device**. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | "computing devices"). Col. 1, ll. 57-60 ("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 "). Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations"). Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests). Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | workstations, input/output devices, "initiator" and "target" devices).<br><br>April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).<br><br>**Extrinsic:**<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). | | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
|---|---|---|---|---|---|
| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that can request access to storage). Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network"). Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 33:** | | | | | |
| The method of claim 32, further comprising preventing the **device** from accessing any storage on the storage device that is not part of a virtual local storage partition assigned to the device. | **Device:** "Computing device that issues storage access requests." | **Device:** **Intrinsic:** Claim 1, Col. 9, ll. 27-30 ("devices" refers to the devices that make requests and are allowed access to storage devices). | **Device:** Computer. | *See '035 patent, claim 1.* | No Construction Necessary. |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Col. 1, ll. 36-37; Col. 2, ll. 4-5; Col. 4, ll. 55-56; Col. 8, ll. 65-68 (the specification describes the devices that make requests to access the storage devices as "computing devices").<br><br>Col. 1, ll. 57-60 ("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 ").<br><br>Claim 3, Col. 9, ll. 37-39 (principles of claim differentiation require "devices," as a group, must necessarily be broader than "workstations").<br><br>Col. 6, ll. 31-41, 46-56 (the specification describes "servers" as a type of computing device that can make storage access requests).<br><br>Abstract, Col. 1, ll. 21-24, ll. 36-37, ll. 53-56; | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | Col. 2, ll. 4-6; Col. 3, ll. 3-6, 41-43; Col. 4, ll. 38-42, ll. 55-56  Col. 6, ll. 45-55; Col. 8, ll. 65-68 ("devices" is used broadly to refer to various computing devices such as workstations, input/output devices, "initiator" and "target" devices).  April 6, 2005 Reply to Office Action at 8, 10, 12, 22, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const., Ex. E; July 22, 2005 Reply to Office Action at 7-15, 21-23, 27-29, 32, 33, 35-37, 39, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F ("Device" is used over ninety times in the reexamination prosecution history to refer to types of devices capable of making requests for storage).  **Extrinsic:**  April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶ 4 (one of | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | ordinary skill would understand that in the embodiments at Col. 6, ll. 33-41; 46-56, it is the server that sends requests for storage access to the storage router using NLLBP). <br><br> The McGraw-Hill Illustrated Dictionary of Personal Computers 126 (4th ed. 1995), Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. W (defining device as "a mechanical, electrical or electromechanical contrivance or appliance. Commonly used in reference to peripherals such as printers, CRTS and disk drives"). <br><br> Hr'g Tr. at 202:24-203:3, 205:4-7, Mar. 8, 2011 (Defendants' counsel agreeing that the defining characteristic of a device is that it is the thing that issues storage requests). <br><br> May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., ¶3 (a "network server" is a server that | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | can request access to storage).<br><br>Microsoft Computer Dictionary 430 (3d Ed. 1997), May 11, 2011 3d Supp. Decl. of John Levy, Ph.D., Ex. A (defining "server" as "(1) on a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network").<br>Special Master's Report at 22, *Dot Hill* Litigation, Pl.'s Cl. Const. Hr'g Ex. P-15 (Court previously construed "storage router" as "a data transmitting device that allows users to integrate different servers or workstations into a storage network"). | | | |
| **Claim 34:** | | | | | |
| A system for providing virtual local storage, | **Configuration:** | **Configuration:** | **Configuration:** | *See claim 1, supra.* | No Construction Necessary. |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| comprising: a host device; a storage device remote from the host device, wherein the storage device has a storage space; a first controller; a second controller; a first transport medium operable according to a Fibre Channel protocol, wherein the first transport medium connects the host device to the first controller; a second transport medium operable according to the Fibre Channel protocol, wherein the second transport medium connects the second controller to the storage device; a supervisor unit coupled to the first controller and the second controller, the supervisor unit operable to: maintain a **configuration** that maps between the host device and at least a portion of the storage space on the storage | "A modifiable setting of information." | **Intrinsic:**<br><br>Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable).<br><br>'147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls").<br><br>Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties | "Map"; otherwise indefinite. | | |

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| | Special Master's Proposed Construction of Disputed Terms | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| device; and | | to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| implement **access controls** according to the configuration for the storage space on the storage device using native low level, block protocol. | **Access control(s):** "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." | **Access control(s):** **Intrinsic:** Fig. 3, Col. 3, ll. 7-59, Col. 4, ll. 7-27, 33-35, 40-43, 48-50, 50-53 (Fig. 3 shows embodiment in which all workstations can access global storage device). Col. 4, ll. 7-11 ("access controls" applies to shared storage). July 22, 2005 Reply to Office Action at 13-14, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (discussion during reexamination, that the "access controls" feature | **Access controls:** Controls that use a map to permit a particular device to read data from or write data to a particular storage space assigned to the device, and to prevent the device from reading data to or writing data from storage space assigned to other devices. **Implement access controls...using native low level, block protocol:** Permit reading and writing of data in the native low level, block protocol of the storage | *See '035 patent, claim 1.* *See "allow access [ing]...using native low level, block protocol" at '035 patent, claim 1.* | "Controls which limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | includes the concept of allowing multiple devices to have access to shared storage).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 3-7, 15, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (Crossroads' construction parallels historic construction; the invention contemplates using access controls for an entire storage device as well as shared storage; Court has rejected a construction in which a particular subset of storage could only be accessed by a single workstation).<br><br>Comments on Statement of Reasons for Patentability and/or Confirmation, Fore Decl. ISO Pl.'s Cl. Const. Br., Ex. I (patentees expressly disagreed with any characterization of the claims that were "inconsistent with the claim language, specification or prior | device, without involving network servers, Ethernet networks, higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols, or translation from one protocol to another. | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | prosecution history."). | | | |
| implement access controls according to the configuration for the storage space on the storage device using **native low level, block protocol**. | **Native low level block protocol ("NLLBP"):**<br><br>**Native:**<br>"Designed for use with a specific type of storage device."<br><br>**Block Protocol:**<br>"A set of rules or standards for exchanging information with a block-oriented storage device."<br><br>**Low Level . . .**<br>**Protocol:**<br>"A set of rules or standards that enable computers to exchange information without involving high level file system protocols."<br><br>Or, in the alternative:<br><br>**Native Low Level Block Protocol:**<br><br>"A set of rules or standards designed for exchanging information with a block-oriented storage device without involving high level file system protocols." | **Native low level block protocol:**<br><br>**Intrinsic:**<br><br>Abstract, Col. 1, ll. 44, Col. 2, ll. 13-14, 26; Col. 3, ll. 17, 22-23, 53, 63; Col. 4, ll. 4-5, 25; Col. 5, l. 3; Claim 1, Col. 9, ll. 29-30; Col. 10, l. 10; Col. 10, ll. 48-49 (specification consistently uses "NLLBP" as a single term).<br><br>Fig. 1; Col. 3, ll. 20-23 (network server shown in Fig. 1 communicates with storage devices via NLLBPs even though the SCSI commands are sent by a network server).<br><br>Fig. 1, Col. 1, ll. 49-54; Col. 3, ll. 17-23 (the "storage router" of the invention is contrasted with a "network server" that allowed access to storage devices by translating high level file system commands of the "network protocol" into | **Native low level block protocol:**<br><br>*Does not need to be separately construed; alternatively, may be construed with reference to individual terms as follows:*<br><br>**Native:**<br>Designed for use with a specific type of storage device.<br><br>**Low-level protocol:**<br>A set of rules or standards that enable computers to exchange information without involving network servers, Ethernet networks, or higher-level protocols such as TCP/IP, Ethernet protocols, network protocols or file system protocols.<br><br>**Block protocol:**<br>A set of rules or standards for exchanging information with a block-oriented storage device | *See '035 patent, claim 1.* | "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." |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | low level requests (i.e., NLLBP) and sending the NLLBP to the physical storage devices).<br><br>Claim 1, Col. 9, ll. 13-30 (storage router "allow[s] access from <u>devices</u> connected to the first transport medium to the storage devices using native low level, block protocols" (emphasis added); the storage router, specifically, the supervisor unit within the storage router, "uses" the NLLBP to permit or enable access).<br><br>Abstract; Col. 2, ll. 12-15, 17-20, 24-27; Col. 3, ll. 59-63; Col. 3, ll. 51-53; Col. 4, ll. 2-6; Col. 5, ll. 1-5; Col. 9, ll. 28-31; Col. 10, ll. 9-11 (specification discloses that NLLBPs are used by, and at, the storage router to allow access).<br><br>Col. 6, ll. 33-41, 46-56 (specification describes two embodiments wherein "devices" making the storage access request are | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
|---|---|---|---|---|---|
| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | servers). April 6, 2005 Reply to Office Action at 10-11, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 24-27, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (Crossroads distinguished Petal, Spring and Oeda as having a server that provided controlled access to storage was required to translate high level file system commands into low level commands in order to send the NLLBP to the storage devices). April 6, 2005 Reply to Office Action at 8-11, 19, 22-23, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. E; July 22, 2005 Reply to Office Action at 11-17, 21-28, Fore Decl. ISO Crossroads' Post-Hr'g Cl. Const. Br., Ex. F (showing that Crossroads did not make | | | |

| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | a sweeping disclaimer of *any* use of a "network server"; Crossroads distinguished its invention from Oeda, Petal and Spring based on the requirement that the "network server" that provided controlled access to storage was required to translate the high level file system command into low level commands in order to send the NLLBP to the storage device, not the use of Ethernet networks, Ethernet or TCP/IP). Col. 2, ll. 17-20; Col. 5, ll. 19-22, 50-57, 60-63; Col. 6, ll. 32-37; '147 Patent, Claim 1, Col. 9, ll. 28-32 (disclosing and claiming embodiments using Fibre Channel; the inclusion of "without involving . . . network protocols" according to Defendants' expert would prohibit the use of Fibre Channel despite the fact that these are express embodiments). Col. 5, ll. 53-56 (Fibre | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Channel is a protocol used for communications over "Fibre Channel based networks").<br><br>Col. 1, ll. 42-53; Col. 3, ll. 16-24; Col. 5, ll. 1-5 (specification notes that NLLBPs do not involve overhead of high level network protocols or file systems).<br><br>Col. 6, ll. 31-41, 46-56 (specification has two distinct embodiments in which the "devices" making storage requests are servers).<br><br>**Extrinsic:**<br><br>March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶2; March 7, 2011 Decl. of Brian Berg ¶42 (experts agree that "NLLBP" is not a term of art).<br><br>Hr'g Tr. at 121:8-16, March 8, 2011 (parties agree that "NLLBP" should be construed as a single term, consistent with use in specification) | | | |

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| Actual Claims Language | Crossroads' Proposed Construction | Crossroads' Evidence | Defendants' Proposed Construction | Defendants' Evidence | Special Master's Construction |
| | | March 7, 2011 Supp. Decl. of John Levy, Ph.D., ¶13 (Ethernet and TCP/IP protocols are concerned only with delivery of messages). March 7, 2011 Decl. of Brian Berg ¶48 (a SCSI command would be a low level command). March 7, 2011 Decl. of Brian Berg, ¶37 (states that "low level" means "without involving . . . file system protocols."). April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶4 (person of ordinary skill would understand that the specification discloses a server that sends requests for storage access to a storage router using NLLBP). Hr'g Tr. 76:4-10, 82:20-23, March 8, 2011 (in hypothetical network of Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J) the | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | workstation sends high level file systems commands to network server); *Id.* at 200:2-5, 201:22-24, 202:24-203:3 (Defendants expressly stated that a "device" is a "computer" that is both "reading or writing data from a storage device" and sending NLLBPs and the only "device" that does so in Graphic 2, shown in Crossroads' Post-Hearing Brief is the "network server").<br><br>Crossroads' Concise Statement of Infringement, *Dot Hill* Litigation (Case No. A-03-CV-754 SS), Fore Decl. ISO Pl.'s Post-Hr'g Cl. Const. Br., Ex. H; April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶5 (accused devices in *Dot Hill* litigation were designed to be used in hypothetical system shown in Graphic 2 of Defendants' Markman Demonstratives (Fore Decl. ISO Pl's Post-Hr'g Cl. Const. Br., Ex. J)). | | | |

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| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | Hr'g Tr. at 81:12-15, March 8, 2011 (all parties agree that the Petal, Spring and Oeda references disclose systems with a "server" interposed between workstations and storage devices); *Id.* at 88:2-89:16; 93:4-7; 100:16-24 (Defendants agree that the "translation" distinguished by patentees during reexamination was from high level file system commands into NLLBP requests); *Id.* at 89:11-16 (parties agree that "allowing access . . . using NLLBP" occurs without a translation from a high level file system command to a NLLBP request); *Id.* at 91:14-16, 92:1-5, 152:4-7 (Defendants concede that the "network protocols" described in the Oeda, Petal and Spring references included file system commands thus, including "without involving . . . network protocols" is superfluous | | | |

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| Special Master's Proposed Construction of Disputed Terms | | | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | to "without involving a translation from a high level file system command to a native low level block protocol request.")<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶7 (CIFS, NFS and FTP are network protocols).<br><br>March 7, 2011 Decl. of Brian Berg, ¶37 (Defendants' expert uses term "network protocol" broadly such that it would include Fibre Channel).<br><br>April 28, 2011 2d Supp. Decl. of John Levy, Ph.D., ¶6 (under Defendants' construction, a protocol used for communication over "Fibre Channel based networks" would be a network protocol).<br><br>February 22, 2011 Decl. of John Levy, Ph.D., ¶¶ 31, 33 (NLLBPs do not have the overhead associated with the use of higher level protocols | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | to access storage); *Id.* ¶ 34 (specification describes network servers communicating with storage using NLLBPs). | | | |
| **Claim 35:** | | | | | |
| The system of claim 34, wherein the supervisor unit is further operable to: <br> maintain a **configuration** that maps from the host device to a virtual representation of at least a portion of the storage space on the storage device to the storage device; and <br> allow the host device to access only that portion of the storage space that is contained in the map. | **Configuration:** <br><br> "A modifiable setting of information." | **Configuration:** <br><br> **Intrinsic:** <br><br> Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). <br><br> '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). <br><br> Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." | **Configuration:** <br><br> "Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | would be meaningless under Defendants' proposed construction).<br><br>**Extrinsic:**<br><br>*Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a configuration" to mean "keeping a modifiable set of information"). | | | |
| **Claim 36:** | | | | | |
| The system of claim 35, wherein the **configuration** comprises a map from a host device ID to a virtual LUN representation of the storage device to a physical LUN of the storage device. | **Configuration:**<br><br>"A modifiable setting of information." | **Configuration:**<br><br>**Intrinsic:**<br><br>Col. 2, ll. 19-23; Col. 5, ll. 53-54; Col. 6, ll. 58-64 (describing "configuration" as information used to control operation of the storage router and which is modifiable). | **Configuration:**<br><br>"Map"; otherwise indefinite. | *See claim 1, supra.* | No Construction Necessary. |

| | | Special Master's Proposed Construction of Disputed Terms | | | |
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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | '147 Patent: Col. 2, ll. 28-32; Col. 9, ll. 36-41 ("configuration" can also include mapping information and additional information, such as information needed to "implement[] access controls"). Claim 15, Col. 11, ll. 23-28 (the limitation "operable to maintain a configuration wherein the configuration includes a map. . ." would be meaningless under Defendants' proposed construction). **Extrinsic:** *Chaparral* Markman Order at 16, Fore Decl. ISO Crossroads' Cl. Const. Br., Ex. L (parties to earlier action agreed to construe "maintain a configuration" to mean "keeping a modifiable setting of information"); February 22, 2011 Decl. of John Levy, Ph.D., ¶46 (person of ordinary skill would understand "maintaining a | | | |

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| **Actual Claims Language** | **Crossroads' Proposed Construction** | **Crossroads' Evidence** | **Defendants' Proposed Construction** | **Defendants' Evidence** | **Special Master's Construction** |
| | | configuration" to mean "keeping a modifiable set of information"). | | | |
| **Claim 37:** | | | | | |
| The system of claim 34, wherein the storage device further comprises storage space partitioned into virtual local storage for the host device. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 38:** | | | | | |
| The system of claim 37, wherein the supervisor unit is further operable to prevent the host device from accessing any storage on the storage device that is not part of a virtual local storage partition assigned to the host device. | [No claim term at issue] | | [No claim term at issue] | | |
| **Claim 39:** | | | | | |
| The system of claim 37, wherein the supervisor unit is further operable to prevent the host device from accessing any storage on the storage device that is not part of a virtual local storage partition assigned to the host device. | [No claim term at issue] | | [No claim term at issue] | | |

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## TABLE OF CITATION ABBREVIATIONS

| Abbreviation | Document(s) | Date | Exhibit No. or Range |
|---|---|---|---|
| Joint Materials | | | |
| Hrg. Tr. | Transcript of *Markman* Hearing before the Honorable Karl Bayer, Jr. | 3/08/2011 | |
| Jt. Ex. | Markman Hearing Joint Exhibits | | Jt. Ex. 101-114 |
| Plaintiff's Pleadings and Exhibits | | | |
| Pl. Br. | Plaintiff Crossroads Systems Inc.'s Markman Brief | 2/22/2011 | |
| Pl. Br. Ex. | Exhibits to Declaration of Elizabeth Brown Fore dated 2/22/2011 (in support of Plaintiff's brief) | | A-FF |
| Levy Decl. | Declaration of John Levy, Ph.D. | 2/22/2011 | |
| Levy Ex. | Exhibits to Declaration of John Levy, Ph.D. | | A-F |
| Levy Supp. | Supplemental Declaration of John Levy, Ph.D. | 3/07/2011 | |
| Levy Supp. Ex. | Exhibits to Supplemental Declaration of John Levy, Ph.D. | | A-L |
| Pl. Hrg. Ex. | Crossroads' Markman Hearing Exhibits | | P-1 to P-37 |
| Pl. PHB | Plaintiff Crossroads Systems Inc.'s Post-Hearing Markman Brief | 4/29/2011 | |
| Pl. PHB Ex. | Exhibits to Declaration of Elizabeth Brown Fore dated 4/29/2011 (in support of Plaintiff's post-hearing brief) | | A-J |
| Levy 2nd Supp. | Second Supplemental Declaration of John Levy, Ph.D. | 4/28/2011 | |

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| Abbreviation | Document(s) | Date | Exhibit No. or Range |
|---|---|---|---|
| Levy 2nd Supp. Ex. | Exhibits to Supplemental Declaration of John Levy, Ph.D. | | A-D |
| Pl. RPHB | Plaintiff Crossroads Systems Inc.'s Reply Post-Hearing Brief | 5/13/2011 | |
| **Defendants' Pleadings and Exhibits** | | | |
| Def. Br. | Brief in Support of Defendants' Proposed Claim Constructions | 2/22/2011 | |
| Def. Ex. | Exhibits to Declaration of George W. Webb III (to accompany Defendants' brief) (also entered as Defendants' hearing exhibits) | 2/22/2011 | Def. Ex. 1-22 |
| Berg Decl. | Declaration of Brian A. Berg | 3/07/2011 | |
| Berg App. | Appendices to Declaration of Brian A. Berg | | Berg. App. A-J |
| Def. PHB | Defendants' Post-Hearing Brief on Issues of Claim Construction | 4/29/2011 | |
| Def. PHB Ex. | Exhibits to Declaration of George W. Webb III (to accompany Defendants' brief) | 4/29/2011 | Def. Ex. 23-24 |
| Def. RPHB | Defendants' Reply Post-Hearing Brief on Issues of Claim Construction | 5/13/2011 | |
| **Frequently Cited Documents** | | | |
| '035 patent | U.S. Pat. 6,425,035 | 7/23/2002 | Jt. Ex. 101 |
| '147 patent | U.S. Pat. 7,051,147 | 5/23/2006 | Jt. Ex. 102 |
| First Reexam Reply | '035 file history, Reply to Office Action Under *Ex Parte* Reexamination Dated 2/07/2005 | 4/06/2005 | Def. Ex. 6 |

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| Abbreviation | Document(s) | Date | Exhibit No. or Range |
|---|---|---|---|
| Second Reexam Reply | '035 file history, Reply to Office Action Under *Ex Parte* Reexamination Dated 5/24/2005 | 7/22/2005 | Def. Ex. 7 |
| '147 Reply | '147 file history, Reply to Office Action Dated 1/27/2005 | 7/27/2005 | Def. Ex. 9 |
| Horst Decl. | Declaration of Robert W. Horst and exhibits in *Crossroads v. Postvision* (W.D. Tex. case 1:10-cv-00652-SS) | 5/20/2010 | Def. Ex. 16 |