

DECLARATION FOR PATENT APPLICATION

DOCKET NUMBER (Optional)  
18022-002

OFFICIAL

As below named inventor, I hereby declare that:

My residence, post office address and citizenship is as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventors (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **A SYSTEM USING FIRST BANNER REQUEST THAT CAN NOT BE BLOCKED FROM REACHING A SERVER FOR ACCURATELY COUNTING DISPLAYS OF BANNERS ON NETWORK TERMINALS (AS AMENDED)**, the specification of which is attached hereto unless the following box is checked:

FAX RECEIVED

[ X ] was filed on June 11, 1997 as United States Application Number or PCT International Application Number 08/872,971 and was amended on March 10, 1999 and on June 2, 1999.

AUG 16 1999

Group 2700

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendments referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s) (Number)	Priority Claimed (Country)	Priority Claimed (Day/Month/Year Filed)	[ ] Yes [ ] No
--	-------------------------------	--	----------------

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT International filing date of this application.

<u>08/858,650</u> (Application Number)	<u>5/19/97</u> (Filing Date)	<u>pending</u> (Status - patented, pending, abandoned)
---	---------------------------------	---

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

JAMES R. YOUNG, Reg. No. 27,847; THOMAS C. FOTISOMI, Reg. No. 35,514; STEVEN C. PETERSEN, Reg. No. 36,238; SCOTT B. ALLISON Reg. No. 38,378; KENT A. LEMBKE, Reg. No. P-44,866; AND AGENT SARAH S. O'Rourke, Reg. No. 41,226

Address all telephone calls to Scott B. Allison at telephone number (303) 546-1300  
Address all correspondence to Scott B. Allison, Chrisman, Bruun & Johnson, 1900 Fifteenth Street, Boulder, Colorado 80302

I hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor (given name, family name) Michael John Griffiths

Inventor's signature [Signature] Date AUG 13 1999

Residence 11334 North Eaton Way, Broomfield, Colorado 80020 Citizenship Canada  
Post Office Address 11334 North Eaton Way, Broomfield, Colorado 80020

DECLARATION FOR PATENT APPLICATION

PTO/SB/01 (11-91)

As below named inventor, I hereby declare that:

DOCKET NUMBER (Optional) 18022-002

My residence, post office address and citizenship is as stated below next to my name.

OFFICIAL

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventors (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled A SYSTEM USING FIRST BANNER REQUEST THAT CAN NOT BE BLOCKED FROM REACHING A SERVER FOR ACCURATELY COUNTING DISPLAYS OF BANNERS ON NETWORK TERMINALS (AS AMENDED), the specification of which is attached hereto unless the following box is checked:

RECEIVED

[X] was filed on June 11, 1997 as United States Application Number or PCT International Application Number 08/872,971 and was amended on March 10, 1999 and on June 2, 1999.

AUG 16 1999

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

Group 2700

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications(s) Priority Claimed Priority Claimed [ ] Yes [ ] No (Number) (Country) (Day/Month/Year Filed)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT International filing date of this application.

08/858,650 5/19/97 pending (Application Number) (Filing Date) (Status - patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

JAMES R. YOUNG, Reg. No. 27,847; THOMAS C. FOLSOM, Reg. No. 35,514; STEVEN C. PETERSEN, Reg. No. 36,238; SCOTT B. ALLISON, Reg. No. 38,370; KENT A. LEMKE, Reg. No. P-44,866; AND AGENT SARAH S. O'ROURKE, Reg. No. 41,226

Address all telephone calls to Scott B. Allison at telephone number (303) 546-1300 Address all correspondence to Scott B. Allison, Christian, Bynum & Johnson, 1900 Fifteenth Street, Boulder, Colorado 80302

I hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor (given name, family name) Michael John Griffiths

Inventor's signature [Signature] Date AUG 12 1999

Residence 11334 North Eaton Way, Broomfield, Colorado 80020 Citizenship Canada Post Office Address 11334 North Eaton Way, Broomfield, Colorado 80020

OFFICIAL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Michael John Griffiths )  
 Serial No.: 08/872,971 )  
 Filing Date: June 11, 1997 )  
 Title: METHOD FOR COUNTING DISPLAYS OF )  
       BANNERS ON TERMINALS CONNECTED )  
       TO A COMPUTER NETWORK )  
 Our File No.: 18022-002 )

Group Art Unit:  
2317 2758

Examiner:  
Dennis Pham

FAX RECEIVED

AUG 16 1999

Group 2700

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.56, 1.97 and 1.98

To: Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

The applicant hereby submits his Supplemental Information Disclosure Statement pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98 and respectfully requests the Examiner to consider the information disclosed in the patents and publications listed below:

CITATIONS

<u>U.S. Patents</u>	<u>Inventors</u>	<u>Issue Dates</u>
5,774,660	Brendel et al.	June 30, 1998
5,341,477	Pitkin et al.	August 23, 1994
5,794,210	Goldhaber et al.	August 11, 1998
5,764,906	Edelstein et al.	June 9, 1998
5,781,550	Templin et al.	July 14, 1998
5,796,952	Davis et al.	August 18, 1998
5,712,979	Graber et al.	January 27, 1998



ARTICLES AND PUBLICATIONS

NetGravity Ad Server 2.0 Announcement. Available at <http://www.netgravity.com>.  
10/96.

Khoda et al. "Ubiquitous advertising on the WWW: Merging advertisement on the browser," *Computer Network and ISDN System*, 28 (1996) 1493-1499. 5/96.

The Goldhaber, Edelstein et al. And Templin et al. references were cited in the Written Opinion by the International Preliminary Examining Authority and the Davis et al. and Graber et al. references were cited in the International Preliminary Examination Report in the counterpart foreign application, and are being submitted pursuant to M.P.E.P. Chapter 609-A(3) and B(2). A copy of the PCT Written Opinion and International Preliminary Examination Report are provided with the citations, and the Examiner is requested to reference item 2 in paragraph 2 in the PCT Written Opinion and item 2 of the International Preliminary Examination Report which are titled Citations and Explanations for the concise explanation of relevance of the cited references.

The Brendel et al. and Pitkin et al. references were cited in the corresponding pending U.S. patent application serial number 08/58,650.

Pursuant to C.F.R. §1.17(p), Applicant submits herewith check no. 73524 in the amount of \$240.00 as payment for the filing of this Supplemental Information Disclosure Statement.

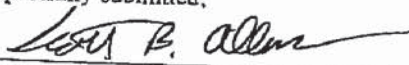
One (1) page of Form PTO-1449 and copies of all the above-cited prior art and the International Preliminary Examining Authority's Written Opinion and International Preliminary Examination are enclosed for the Examiner's convenience. This Information



Disclosure Statement Under 37 C.F.R. §§ 1.56 and 1.97 is not to be construed that no other material information as defined in 37 C.F.R. §1.56(a) exists, or that these citations constitute prior art under 35 U.S.C. §102.

Dated this 17<sup>th</sup> day of March, 1999.

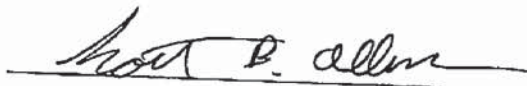
Respectfully submitted,



Scott B. Allison, Reg. No. 38,370  
CHRISMAN, BYNUM & JOHNSON, P.C.  
1900 Fifteenth Street  
Boulder, Colorado 80302  
Telephone: (303) 546-1300

**CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8**

I hereby certify that the foregoing SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§ 1.56, 1.97 AND 1.98 together with PTO-Form 1449, copies of all recited prior art, and Check No. 73524 in the amount of \$240.00 were mailed by first-class U.S. mail, postage prepaid to the Assistant Commissioner for Patents, Washington, DC 20231 on this 17<sup>th</sup> day of March 1999.



OFFICIAL

FAX RECEIVED  
AUG 16 1999  
Group 2700

RE: MatchLogic, Inc.  
SERIAL NO.: 08/872,971  
FILING DATE: June 11, 1997  
FOR: Method for Counting Displays of Banners on  
Terminals Connected to a Computer Network  
DATE: 17<sup>th</sup> March 1999  
ITEMS ENCLOSED: 1. SUPPLEMENTAL  
INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.56, 1.97 AND 1.98; 2. PTO-  
Form 1449 WITH COPIES OF ALL RECITED  
PRIOR ART; 3. Check No. 73524 IN THE AMOUNT  
OF \$240.00; and 4. CERTIFICATE OF MAILING  
UNDER 37 CFR 1.8.



card and return it to us  
Office of receipt of the

Our File No.: 18022-002



#9  
SK  
9-15-99

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on September 3, 1999.

Scott B. Allison

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants:	Michael J. Griffiths	)	
	James D. McElhiney	)	
		)	
Serial No.:	08/858,650	)	
		)	Group Art Unit: 2757
Filing Date:	May 19, 1997	)	
		)	Examiner:
Title:	Information Storage and Delivery Over a Computer	)	Dung Dinh
	Network Using Centralized Intelligence To Monitor	)	
	and Control the Information Being Delivered	)	
		)	
Our File No.:	18022-1	)	

REQUEST FOR THREE-MONTH EXTENSION OF TIME

**RECEIVED**

To: Assistant Commissioner for Patents  
Washington, D.C. 20231

SEP 13 1999

Group 2700

Sir:

The applicant hereby requests a three-month extension of time from June 4, 1999 to September 3, 1999, in which to respond to the Office Action, Paper No. 7, dated March 4, 1999. Our Check Number 75582, in the amount of \$435.00 is enclosed to cover payment of this three-month extension of time request. The applicants' Declaration to establish small entity status has been previously filed.

Respectfully submitted,

Scott B. Allison  
 Scott B. Allison, Reg. No. 38,370  
 1900 Fifteenth Street  
 Boulder, Colorado 80302  
 Telephone: (303) 546-1300  
 Facsimile: (303) 449-5426

Dated: September 3, 1999

09/03/1999 HKAMARA-00000049-00858650

01 FC-203  
02 FC-202

324.00-00  
156.00-00

09/09/1999 HKAMARA 00000049 08858650 435.00 00  
04 FC-217





CAA-2757/1#  
#10

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)	
Serial No.:	08/858,650	)	Art Unit: 2757
Filing Date:	May 19, 1997	)	
Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED	)	Examiner: Dung Dinh
Our File No.:	18022-001	)	

RECEIVED  
SEP 13 1999  
Group 2700

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8

I hereby certify that the following:

1. Check No. 75582 in the amount of \$435.00 for Three Month Request for Extension of Time;
2. Check No. 75585 in the amount of \$480.00, filing fee for additional claims;
3. Check No. 75580 in the amount of \$240.00, filing fee for Supplemental Information Disclosure Statement;
4. Form PTO-1083;
5. Request for Three Month Extension of Time;
6. Amendment Under 37 C.F.R. §1.111;
7. Supplemental Information Disclosure Statement; and

return postcard are being deposited with the United States Postal Service as first-class mail, postage prepaid, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on this 3rd day of September, 1999.



CASE DOCKET NO. 18022-001

In re Application of: Michael J. Griffiths and James D. McElhiney

Serial No.: 08/858,650

Filed: May 19, 1997

For: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

THE COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

- Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted
- A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.
- No additional fee is required.

The fee has been calculated as shown below:

(Col. 1) CLAIMS REMAINING AFTER AMENDMENT	(Col. 2) HIGHEST NO. PREVIOUSLY PAID FOR	(Col. 3) PRESENT EXTRA	SMALL ENTITY RATE OR FEE	OTHER THAN SMALL ENTITY RATE FEE
TOTAL 78 MINUS 42 = 36			x\$9= \$ 324	x\$18= \$ _____
INDEP. 9 MINUS 5 = 4			x\$39= \$ 156	x\$78= \$ _____
MULTIPLE DEPENDENT CLAIMS			x\$130= \$ _____	x\$260= \$ _____
			TOTAL \$ 480	TOTAL \$ _____

RECEIVED  
SEP 13 1999  
Group 2700

Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_. A duplicate copy of this sheet is attached.

A check in the amount of \$ 480.00 is attached.

The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 03-1725. A duplicate copy of this sheet is attached.

- Any filing fees under 36 CFR 1.16 for the presentation of extra claims.
- Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

Scott B. Allison, Reg. No. 38,370  
CHRISMAN, BYNUM & JOHNSON, P.C.  
1900 Fifteenth Street  
Boulder, CO 80302  
(303) 546-1300



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#10  
SK  
9-15-99

Applicants: Michael John Griffiths and )  
 James David McElhiney )  
 Serial No.: 08/858,650 ) Group Art Unit: 2757  
 Filing Date: May 19, 1997 ) Examiner: Dung Dinh  
 Title: INFORMATION STORAGE AND DELIVERY )  
 OVER A COMPUTER NETWORK USING )  
 CENTRALIZED INTELLIGENCE TO MONITOR )  
 AND CONTROL THE INFORMATION BEING )  
 DELIVERED )  
 Our File No.: 18022-001 )

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.56, 1.97 and 1.98

To: Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

The applicants hereby submit their Supplemental Information Disclosure Statement pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98 and respectfully request the Examiner to consider the information disclosed in the patents and publications listed below:

CITATIONS

<u>U.S. Patents</u>	<u>Inventors</u>	<u>Issue Dates</u>
5,712,979	Graber et al.	January 27, 1998
5,715,453	Stewart	February 3, 1998
5,727,129	Barrett et al.	March 10, 1998
5,742,768	Gennaro et al.	April 21, 1998
5,764,235	Hunt et al.	June 9, 1998
5,764,906	Edelstein et al.	June 9, 1998

03/05/1999 HHC/MARR 00000049 08050650 240.00 DP  
03 FC:126



5,781,550	Templin et al.	July 14, 1998
5,781,739	Bach et al.	July 14, 1998
5,793,972	Shane	August 11, 1998
5,794,210	Goldhaber et al.	August 11, 1998
5,796,952	Davis et al.	August 18, 1998

Pursuant to C.F.R. §1.17(p), Applicants submit herewith check no. 75580 in the amount of \$240.00 as payment for the filing of this Supplemental Information Disclosure Statement.

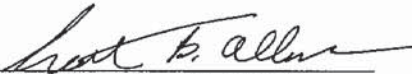
One (1) page of Form PTO-1449 and copies of all the above-cited prior art are enclosed for the Examiners convenience.

Dated this 3rd day of September, 1999.

**RECEIVED**

SEP 13 1999

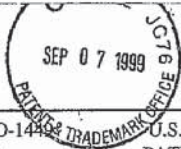
Respectfully submitted, **Group 2700**

  
 Scott B. Allison, Reg. No. 38,370  
 CHRISMAN, BYNUM & JOHNSON, P.C.  
 1900 Fifteenth Street  
 Boulder, Colorado 80302  
 Telephone: (303) 546-1300

**CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8**

I hereby certify that the foregoing SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§ 1.56, 1.97 and 1.98, along with PTO-Form 1449 and copies of all recited prior art, was mailed by first-class U.S. mail, postage prepaid to the Assistant Commissioner for Patents, Washington, DC 20231 on this 3rd day of September, 1999.





Sheet 1 of 1

FORM PTO-1449 (Rev. 7-80) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE <b>LIST OF PRIOR ART CITED BY APPLICANT</b> (Use several sheets if necessary)	ATTY. DOCKET NO. 18022-001	SERIAL NO. 08/858.650
	APPLICANTS: Griffiths, et al.	
	FILING DATE May 19, 1997	GROUP <del>2757</del> 2153

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AA	5,712,979	1/27/98	Graber et al.	395	200.11	
AB	5,715,453	2/3/98	Stewart	395	615	
AC	5,727,129	3/10/98	Barrett et al.	395	12	
AD	5,742,768	4/21/98	Gennaro et al.	295	200.33	
AE	5,764,235	6/9/98	Hunt et al.	345	428	
AF	5,764,906	6/9/98	Edelstein et al.	395	200.49	
AG	5,781,550	7/14/98	Templin et al.	370	401	
AH	5,781,739	7/14/98	Bach et al.	395	200.57	
AI	5,793,972	8/11/98	Shane	395	200.49	
AJ	5,794,210	8/11/98	Goldhaber et al.	705	14	
AK	5,796,952	8/18/98	Davis et al.	395	200.54	

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER	<i>D DMM</i>	<i>12/14/98</i>
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

RECEIVED  
 SEP 13 1999  
 Group 2700



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

411/A  
55X  
9-15-99

Applicants:	Michael J. Griffiths James D. McElhiney	)	
Serial No.:	08/858,650	)	
Filing Date:	May 19, 1997	)	Group Art Unit: 2757
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	)	Examiner: Dung Dinh
Our File No.:	18022-1	)	

AMENDMENT UNDER 37 C.F.R. § 1.111

To: Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

**RECEIVED**  
SEP 13 1999  
Group 2700

Dear Sir:

In response to the Patent Examiner's Office Action, Paper No. 7, dated March 4, 1999,  
please amend the above-identified patent application, as follows:

In the Specification:

On page 25, line 3, replace "The method 72" with --The prior art method 72--.

On page 34, line 19, before "302" insert --HTTP--.

On page 36, line 19, replace "stings" with --strings--.

On page 37, line 1, replace "bannersite1.cm" with --bannersite1.com--.

On page 50, line 15, insert --- after "response".

09/09/1999 HIKAMARA 00000049 08858650

01 FC:203  
02 FC:202

324.00 BP  
156.00 BP

A



In the Claims:

Please cancel claims 2, 13, 26, 42 without prejudice to the subject matter claimed therein.

Please amend the claims as follows:

Sub 1

1. (Amended) A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising [the steps of]:
- servicing a first portion of [the] information to [the] a terminal, wherein said first portion of [the] information contains a reference to a second portion of [the] information;
  - [sending] causing a first request signal to be transmitted from the terminal to a [the] primary server requesting a location address for said second portion of [the] information from which said second portion of [said] information can be served to the terminal, wherein said first request signal cannot be blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;
  - sending a location signal from the primary server to the terminal providing said location address of said second portion of [the] information;
  - [sending] causing a second request signal to be transmitted from the terminal containing said location address of said second portion of [the] information and

A1

A

A1

requesting said second portion of [the] information be served to the terminal; and  
serving said second portion of [the] information to the terminal.

A2

3. (Amended) The method of claim 1 [2], wherein said second portion of [the] information is served from the primary or secondary servers.

6. (Amended) The method of claim 1, wherein said second portion of [the] information is served from one of the secondary servers.

7. (Amended) The method of claim 1, wherein after the primary server receives the first request signal from the terminal, further including [the step of] determining which server connected to the computer network is best suited for serving said second portion of [the] information to the terminal.

A3

8. (Amended) The method of claim [8] 7, wherein results of said determining [determination step] are included in said location signal sent from the information server to the terminal.

9. (Amended) The method of claim 8, including [the steps of] creating a matrix of selections between each of the terminals or groups of terminals and each of the servers and using said matrix to determine which of the servers is best suited to serve said second portion of [the] information to the terminals or groups of terminals.

A4

11. (Amended) The method of claim 1, including [the step of] making one of the secondary servers a new primary server if the original primary server becomes inaccessible.

12. (Amended) The method of claim 1, including [the step of] storing said second portion of [the] information in the terminal.

62

A

14. (Amended) The method of claim 4, including [the step of] selecting the composition of said second portion of [the] information.

15. (Amended) The method of claim 14, wherein the results of said composition selection [step] are included in said location signal sent from the information server to the terminal.

Sub B2  
AS  
16. (Amended) A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a [hypertext] document served to the device, wherein the banner is stored in one or more servers, comprising [the steps of]:

[sending] receiving a first banner request signal from [the] a device [to] at a first server requesting that a banner be served to the device, wherein said first banner request signal cannot be blocked from reaching said first server by the device despite previous caching of said specified banner in the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

[sending] receiving a second banner request signal from the device [to] at said second server requesting that the second server serve said specified banner to the device.

22  
28. (Amended) The method of claim <sup>20</sup>16, including [the step of] determining which of the servers is best suited for serving said specified banner to the device.

23  
18. (Amended) The method of claim <sup>22</sup>18, wherein said [step of] determining which of the servers is best suited for serving said specified banner to the device is performed in said





A4

first server after said first server receives said first banner request signal from the device.

<sup>26</sup>/~~25~~. (Amended) The method of claim <sup>20</sup>/~~18~~, including [the step of] storing said specified banner in said device.

A7

<sup>27</sup>/~~23~~. (Amended) The method of claim <sup>26</sup>/~~22~~, including [the step of] determining whether said specified banner is stored in the device before said [step of sending] receiving said second banner request signal.

<sup>28</sup>/~~24~~. (Amended) The method of claim <sup>20</sup>/~~18~~, including [the step of] selecting said specified banner prior to sending said banner location signal from said first server to the device.

Sub 33

27. (Amended) A method for [serving] enabling a web page and an associated banner to be served to a computer [running browser software], wherein the web page contains a link or other reference [links] to the banner, comprising [the steps of]:

    serving [the] a web page to [the] a computer; [for display by the browser software];

    [sending] causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes [the] a Uniform Resource Locator address for said primary server and wherein said banner request signal cannot be blocked from being received by the primary server as a result of previous caching of the banner on the computer;

    determining which specified banner will be served to the computer; and

    sending a banner location signal from said primary server to the computer, wherein said banner location signal includes the Uniform Resource Locator address for a

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A8  
B3

device on which the specific banner to be served to the computer is stored.

<sup>36</sup>29. (Amended) The method of claim <sup>34</sup>27, including [the step of] determining whether said specified banner is stored on the computer.

A9

<sup>37</sup>30. (Amended) The method of claim <sup>36</sup>29, wherein after said [step of] determining whether said specified banner is stored on the computer, if said specified banner is not stored on the computer then including [the step of sending] causing a [specified] second banner request signal to be sent to said device requesting that said device serve said specified banner to the computer.

A10

<sup>41</sup>34. (Amended) The method of claim <sup>34</sup>27, including [the step of] tagging said specified banner as being cachable.

Sub B4

36. (Amended) A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising [the steps of]:

A11

[sending] receiving a first banner request signal from the device [to] at a first server requesting that a banner be served to the device, wherein said first banner request signal [is not] cannot be blocked by the device or [any] an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device;

determining if said first server is best suited to serve said banner to the device and serving said banner to the device if said first server is best suited to serve said banner and,

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if said first server is not best suited to server said banner to the device, sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server;

[sending] receiving a second banner location request signal from the device [to] at said second server requesting that [the] said second server serve said specified banner to said device if said first server is not best suited to server said banner to the device; and serving said specified banner to said device from said second server if said first server is not best suited to server said banner to the device.

AX BY

37. (Amended) A method for enabling distribution of [distributing] a banner over a computer network to a device when the banner is referenced in a document served to the device, wherein the banner is stored in one or more servers connected to the computer network, and the device is connected to the computer network via an intermediary server, comprising [the steps of]:

[sending] causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal is not blockable by the device or the intermediary server as a result of a storage in the device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for [a specified] said requested banner stored on a second server; and

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determining if said [specified] requested banner is stored on the device and, if said [specified] requested banner is not stored on the device, then [sending] causing a second banner request signal to be transmitted from the device to the intermediary server and determining if said [specified] requested banner is stored on the intermediary server, wherein if said [specified] requested banner is not stored on the intermediary server, [sending] causing at least a portion of said second banner request signal to be sent to said second server requesting that said second server serve said [specified] requested banner to said device.

A12 53 41. (Amended) The method of claim ~~37~~<sup>49</sup>, including [the step of] having said first server select said [specified] requested banner.

Kindly add the following new claims:

SMB  
A12

43. A method for serving a banner to a client device, comprising:  
receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request cannot be prevented from being received by the primary server despite previous storage of the banner on the client device;  
sending a signal from the primary server to the client device that includes at least a portion of a second URL associated with the banner's location;  
receiving at the primary server a second TCP/IP compliant request requesting that the banner be served to the client device if the banner is not stored on the client device;  
serving the banner to the client device; and



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-44. counting at least one display of the banner on the client device.--

59  
-44. The method of claim 43, wherein said first request includes the strings "cgi-bin" and "7".--

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-45. The method of claim 43, wherein said signal sent from said primary server to the client device includes an HTTP 302 redirect command.--

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59  
-46. The method of claim 43, wherein said first request cannot be prevented from being received by the primary server as a result of previous caching or storing of the banner by an intermediary device connected to the computer network.--

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42  
-47. The method of claim 43, wherein said intermediary device is connected topologically on said computer network between the client device and the primary server.--

AKB

Sub B

-48. A method for enabling accurate counting of displays of a banner on a client device, comprising:

receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request signal cannot be prevented from being received by said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary device;

sending a banner location signal to the client device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

causing a determination of whether said specified banner is stored on the client device and, if said specified banner is not stored on the client device, receiving a second banner request signal from the client device at said intermediary device and causing a

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determination of whether said specified banner is stored on said intermediary device, wherein if said specified banner is not stored on said intermediary device, receiving a third banner request signal at said second server requesting that said second server serve said specified banner to the client device.--

~~65~~ ~~59~~. The method of claim ~~48~~, wherein said intermediary device is a proxy server.--

~~66~~ ~~60~~. The method of claim ~~48~~, wherein said third banner request signal is identical to said second banner request signal.--

~~67~~ ~~51~~. The method of claim ~~48~~, wherein said banner location signal includes an HTTP 302 redirect command.--

A13

~~68~~ ~~52~~. The method of claim ~~48~~, wherein said first banner request signal includes the strings "cgi-bin" and "?".--

~~69~~ ~~53~~. The method of claim ~~48~~, wherein said first server and said second server are the same server.--

~~70~~ ~~54~~. The method of claim ~~48~~, including serving said specified banner to the client device.--

~~71~~ ~~55~~. The method of claim ~~54~~, including counting at least one display of said specified banner on the client device.--

Sub B1

~~56~~. A method for serving a banner to a client device, comprising:  
receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal cannot be prevented from being received by the primary server as a result of previous

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 caching of the banner in the client device;  
 sending a signal from the primary server to the client device that includes a  
 second URL associated with the banner's location;  
 receiving a second request signal requesting that the banner be served to the client  
 device if the banner is not stored on the client device; and  
 serving the banner to the client device.--

73  
~~57~~. The method of claim 72~~56~~, including counting at least one display of the banner on  
 the client device.--

74  
~~58~~. The method of claim 72~~56~~, wherein said first request signal includes the strings  
 "cgi-bin" and "?".--

2  
~~59~~. The method of claim 1, wherein said intermediary device is a proxy server.--

13  
~~60~~. The method of claim 1, wherein said first request signal includes the strings "cgi-  
 bin" and "?".--

16  
~~61~~. The method of claim 1, wherein said location signal includes an HTTP 302  
 redirect command.--

17  
~~62~~. The method of claim 1, wherein said reference to a second portion of information  
 includes at least a portion of a URL.--

18  
~~63~~. The method of claim 1, wherein said first portion of information is a web page,  
 said second portion of information is a banner, and said reference is a link.--

20  
~~64~~. The method of claim 16, including counting a display of said specified banner on  
 said device.--

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<sup>31</sup>/~~65~~. The method of claim <sup>20</sup>/~~16~~, wherein said location information includes at least a portion of a URL.--

<sup>32</sup>/~~66~~. The method of claim <sup>20</sup>/~~16~~, wherein said first request signal includes the strings "cgi-bin" and "?".--

<sup>33</sup>/~~67~~. The method of claim <sup>20</sup>/~~16~~, wherein said banner location signal includes an HTTP 302 redirect command.--

<sup>44</sup>/~~68~~. The method of claim <sup>43</sup>/~~36~~, wherein said document is a web page.--

<sup>45</sup>/~~69~~. The method of claim <sup>43</sup>/~~36~~, wherein said first banner request signal includes the strings "cgi-bin" and "?".

<sup>46</sup>/~~70~~. The method of claim <sup>45</sup>/~~69~~, wherein said banner relocation signal includes an HTTP 302 redirect command.--

<sup>47</sup>/~~71~~. The method of claim <sup>43</sup>/~~36~~, wherein said banner location information includes at least a portion of a URL.--

<sup>54</sup>/~~72~~. The method of claim <sup>49</sup>/~~37~~, wherein said first banner request signal includes the strings "cgi-bin" and "?".--

<sup>55</sup>/~~73~~. The method of claim <sup>49</sup>/~~37~~, wherein said banner location signal includes an HTTP

302 redirect command.--

<sup>56</sup>/~~74~~. The method of claim <sup>49</sup>/~~37~~, wherein the document includes at least a portion of a

web page.--

<sup>57</sup>/~~75~~. The method of claim <sup>49</sup>/~~37~~, wherein said location information includes at least a portion of a URL.--



Sub B88

A13

--76. A method for enabling a banner to be received at a client device, comprising:  
 generating at the client device a first request signal for a banner;  
 transmitting said first request signal to a server, wherein said first request signal  
 cannot be prevented from being received by the server as a result of previous caching of  
 the banner on the client device;  
 receiving at the client device a response signal from the server that includes a  
 URL associated with the banner's location; and  
 transmitting a second request signal from the client device requesting that the  
 banner be served to the client device.--

~~76~~ <sup>75</sup>  
 --77. The method of claim ~~76~~, wherein said first banner request signal includes the  
 strings "cgi-bin" and "?".--

~~77~~ <sup>75</sup>  
 --78. The method of claim ~~76~~, wherein said response signal includes an HTTP 302  
 redirect command.--

~~78~~ <sup>75</sup>  
 --79. The method of claim ~~76~~, including receiving the banner at the client device.--

~~19~~  
 --80. The method of claim 1, including counting at least one display of said second  
 portion of information on the terminal.--

~~48~~ <sup>43</sup>  
 --81. The method of claim ~~36~~, including counting at least one display of said specified  
 banner on the device.--

~~58~~ <sup>49</sup>  
 --82. The method of claim ~~37~~, including counting at least one display of said specified  
 banner on the device.--

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**REMARKS**

In the Office Action, Paper No. 7, dated March 4, 1999, the Patent examiner rejected claims 1-42 under 35 U.S.C. § 103 as being unpatentable over the article to *Kohda et al.* in view of U.S. Patent No. 5,431,477 issued to *Pitkin et al.*

The applicants have carefully considered the patent examiner's rejections, the reasons for the rejections, and the prior art cited by the patent examiner. In response, the applicants have deleted claims 2, 13, 26, and 42 and added new claims 43-82. In addition, the applicants have amended claims 1, 3, 6, 7, 8, 9, 11, 12, 14, 15, 16, 18, 19, 22, 23, 24, 27, 29, 30, 34, 36, 37, and 41 to define more clearly the essence of their invention. Please note that the applicants do not desire or intend that any elements of any of the pending claims be construed as being in step-plus-function claim element format and none of the elements of any of the pending claims should be construed as being in such step-plus-function claim element format. The applicants have also amended the specification to correct inconsistencies noted by the applicants. No new matter is introduced by this amendment.

**The Applicants' Invention and the Prior Art References Cited by the Patent Examiner**

Turning now to the substantive rejections of the applicants' claims over the *Kohda et al.* and the *Pitkin et al.* references, it is important to first put those two references in perspective with the applicants' invention. In order to do so, it is also important to recognize at least four of the fundamental principles of the applicants' invention.

First, applicants' invention is specifically directed to the serving of banners or other information from a server device to a client device via a computer network and the accurate

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counting of such display of banners or other information on the terminal or client device. *See*, Applicants' disclosure, page 5, line 20 to page 6, line 1; page 11, line 17 to page 12, line 3; page 13, line 19 to page 14, line 9; page 39, lines 6-17. Inaccurate counting of banner displays on the client device is often caused by previous caching or storage of the banner on the client device or on proxy servers, or other intermediate devices topologically connected between the client device and the server device, which prevent requests or request signals for the banners generated or sent by the client device from reaching the server device. Thus, as a result of such caching or storage of the banners on the client device, proxy servers, or other intermediate devices, such requests or request signals are blocked or otherwise prevented from reaching the server device. *See*, Applicants' disclosure, page 11, line 20 to page 12, line 3; page 12, line 16 to page 13, line 18; page 18, line 8 to page 22, line 1; page 25, line 3 to page 26, line 5. Applicants' invention reduces the inaccurate display counting caused by caching of the banners by making or causing request signals generated or transmitted by a client device unblockable by the client device or proxy server, even though the banners may have been previously stored on the client device or proxy server. Therefore, despite such caching or storage of the banners on the client device, proxy servers, or other intermediate devices, the request signals generated or transmitted by the client device cannot be blocked or prevented from reaching the server device. In other words, the request signals generated by the client device cannot be blocked or prevented from reaching the server device as a result or consequence of previous caching or storage of the banners on the client device, proxy servers, or other intermediate devices. *See*, Applicants' disclosure, page 28, line 9 to page 29, line 10. It should be noted that no specific limitations are intended by the use



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of the terms "terminal," "device," "client device," or "server" as those terms are used in the applicants' patent application, in the applicants' claims, or in this response to the first Office Action.

Second, applicants' invention allows such serving and counting to occur without significantly increasing data traffic on the computer network or unnecessarily delaying the display of the banners or other information on the client device. *See*, Applicants' disclosure, page 5, lines 2-4; page 26, line 17 to page 27, line 15; page 28, lines 9-13; page 37, lines 5-15. Applicants' invention controls the use of cached banners or advertisements such that accurate counting of displays of the banners and advertisements can be made, as previously discussed above, but allows and takes advantage of caching when appropriate and possible to reduce congestion or unnecessary data traffic on the computer network. *See*, Applicants' disclosure, page 39, line 18 to page 40, line 10.

Third, applicants' invention allows banners or advertisements to be targeted to users to increase the banners' or advertisements' effectiveness. *See*, Applicants' disclosure, page 5, lines 18-19; page 28, lines 14-16; page 38, line 18 to page 39, line 2. Therefore, applicants' invention allows advertisements to be selected for display to a user based on demographic or other information known about the user and uses content general or content specific request signals as part of the disclosed method. *See*, Applicants' disclosure, page 28, lines 5-8; page 38, line 18 to page 39, line 2.

Fourth, applicants' invention increases fault tolerance and reliability for information and banner delivery and storage systems, thereby increasing the ability to continuously serve



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information and banners to clients or client devices. *See*, Applicants' disclosure, page 6, lines 5-7; page 40, line 11 to page 41, line 20; page 48, line 16 to page 50, line 15. Mirroring and redundancy of banners and other information also allows for more efficient delivery of such banners and other information to clients or client devices. *See*, Applicants' disclosure, page 50, line 16 to page 51, line 10.

In contrast to the applicants' invention, the *Kohda et al.* reference is directed to an advertising framework in which users, "who agree to see advertisements while browsing," negotiate with advertising agents so as to allow tailored advertising to be delivered by the advertising agents to the users. Thus, the users make a contract with the advertising agent. *See*, *Kohda et al.* reference, pages 1494-1495.

Once a contract is established between a user and an advertising agent, the agent provides the user with a special filtering browser by the agent that allows the agent to track all pages and advertisements served to the user. In addition, the filter is displayed as part of the browser software on the user's computer.

The filter keeps in memory the contact path (URL) to the agent's Web server. When it is invoked, it forwards the invocation parameters passed from the browser to the agent's Web server, and waits for a reply. Then the agent's Web server returns one of its advertisements or other useful information. The filter merges the reply from the agent's Web server before the input from the pipe, i.e., Web pages from other Web servers.

*See*, *Kohda et al.* reference, page 1497. In this disclosed scheme, the agent controls the advertisements served to the user and a predefined relationship must exist between the user and the agent. Furthermore, the agent's browser must be modified by the filtering software to allow the agent to "detect" the actions initiated by the user. *See*, *Kohda et al.* reference, page 1495.

The agent also detects all events initiated or undertaken by the user, thereby allowing the agent to develop an accumulated record of the user's interests and activities. *Id.*

While the *Kohda et al.* reference is related to advertising, it simply does not recognize or address the problems encountered with accurate counting of banners served to users, particularly the need to provide accurate counting without significantly increasing computer network data traffic. More specifically, *Kohda et al.* do not teach or even recognize the problems associated with accurate counting of banners delivered to client devices created by caching of such banners on the terminal or other devices topologically located between the terminal and a server. In fact, *Kohda et al.* do not even discuss the caching of banners on a terminal. Moreover, in contrast to the applicants' invention, *Kohda et al.*'s disclosed method requires a user-selected agent that controls the advertising delivered to the user and specialized browser software to allow the agent to detect and monitor user activity.

The *Pitkin et al.* patent is directed to the allocation of resources within a computer network architecture. Unlike the applicants' invention, however, *Pitkin et al.* do not teach or even address the concept of serving advertisements, information, banners, etc. in an efficient manner that promotes the accurate counting of displays of such advertisements, information, banners, etc.

#### **Obviousness Rejections**

The Patent Examiner rejected claims 1-42 under 35 U.S.C. § 103(a) as being unpatentable over the *Kohda et al.* reference in view of the *Pitkin et al.* patent. The applicants respectfully disagree that the combination of these references results in the applicants' claimed invention. In

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addition, the applicants point out that the *Kohda et al.* and *Pitkin et al.* references are directed to very different problems in non-analogous areas. Therefore, the Patent Examiner's combination of these references is improper. The combination of elements from non-analogous sources, in a manner that reconstructs the applicants' invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Moreover, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to replicate the claimed invention. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Care must be taken to avoid hindsight reconstruction by using the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit. Grain Processing Corp. v. American Maize-Products Corp., 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988).

*Kohda et al.* do not address the problems identified by *Pitkin et al.*, *i.e.*, the allocation of resources within a computer network architecture. Moreover, *Pitkin et al.* do not address or even suggest the problems identified by *Kohda et al.*, *i.e.*, delivery of targeted advertisements. The inquiry into obviousness is not whether each element existed in the prior art, but whether the prior art made obvious the invention as a whole for which patentability is claimed. Hartness International, Inc., v. Simplimatic Engineering Co., 819 F.2d 1100, 2 USPQ2d 1826 (Fed. Cir. 1987). Furthermore, without some suggestion or incentive in the prior art, independent of applicants' claims, it is improper to combine the prior art references in a manner necessary to show the applicants' invention in a 35 U.S.C. § 103 obviousness rejection. In re Samour, 197

USPQ 1 (CCPA 1978); In re Rinehart, 189 USPQ 143 (CCPA 1976); Ex parte Shepard and Gushue, 188 USPQ 536 (Bd. Pat. App. & Int. 1974). Among other things, since the inventions disclosed in the *Kohda et al.* or *Pitkin et al.* references are directed to such different problems, and since any combination of the inventions disclosed in the *Kohda et al.* or *Pitkin et al.* references would require extensive or cumbersome modifications to either or both of the inventions disclosed in the *Kohda et al.* or *Pitkin et al.* references, there is simply no suggestion or teaching in either the *Kohda et al.* or *Pitkin et al.* references to combine them in any fashion whatsoever.

In addition to the above, as previously discussed, neither the *Kohda et al.* nor *Pitkin et al.* references address or even suggest the goal of accurate counting of banner displays with efficient delivery of such banners to client devices, or the problems in reaching such a goal created by previous caching of a banner. Furthermore, neither the *Kohda et al.* nor *Pitkin et al.* references disclose or even fairly suggest the need to prevent blocking of request signals for a banner or other information from reaching a server as a result of previous caching or other storage of the banner or other information on a device other than the server. While the banner request signals discussed in the *Kohda et al.* reference may reach a server, there is no guarantee that such signals will not be blocked or otherwise prevented from reaching the server as a result of previously caching of a requested banner. Therefore, even if the teachings of the *Kohda et al.* and *Pitkin et al.* references are combined, neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second

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portion of information can be served to the terminal, wherein said first request signal cannot be blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device, as recited in applicants' amended independent claim 1; receiving a first banner request signal from a device at a first server requesting that a banner be served to the device, wherein said first banner request signal cannot be blocked from reaching said first server by the device despite previous caching of said specified banner in the device, as recited in applicants' amended independent claim 16; causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes a Uniform Resource Locator address for said primary server and wherein said banner request signal cannot be blocked from being received by the primary server as a result of previous caching of the banner on the computer, as recited in applicants' amended independent claim 27; receiving a first banner request signal from the device at a first server requesting that a banner be served to the device, wherein said first banner request signal cannot be blocked by the device or an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device, as recited in applicants' amended claim 36; or causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal is not blockable by the device or the intermediary server as a result of a storage in the

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device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device, as recited in applicants' amended claim 37. Thus, applicants' amended independent claims 1, 16, 27, 36, and 37 are non-obvious and allowable over the *Kohda et al.* or *Pitkin et al.* references or any other references cited by the Patent Examiner or provided by the applicants' in their Supplemental Information Disclosure Statement filed concurrently herewith.

In addition to the above, neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request cannot be prevented from being received by the primary server despite previous storage of the banner on the client device, as recited in applicants' new independent claim 43; receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request signal cannot be prevented from being received by said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary, as recited in applicants' new independent claim 48; receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal cannot be prevented from being received by the primary server as a result of previous caching of the banner in the client device, as recited in applicants' new independent claim 56; or transmitting said first request signal to a server, wherein said first request signal cannot be prevented from being received by the server as a result of previous caching of the banner on the client device, as recited in applicants' new independent claim 76. Moreover,

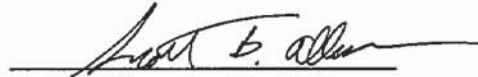
---

neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest counting at least one display of the banner on the client device, as recited in applicants' claim 43. Therefore, applicants' new independent claims 43, 48, 56 and 76 are non-obvious and allowable over the *Kohda et al.* or *Pitkin et al.* references or any other references cited by the Patent Examiner or provided by the applicants' in their Supplemental Information Disclosure Statement filed concurrently herewith.

In addition to the above, neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest the use of "cgi-bin" and "?" strings, as recited in applicants' dependent claims 44, 52, 58, 66, 69, 72, and 77 and supported in page 36, line 14 to page 37, line 4 of the applicants' original disclosure, the use of HTTP 302 redirect commands, as recited in applicants' dependent claims 32, 45, 51, 60, 67, 70, 73, 78 and supported in page 34, lines 1-18 and claim 32 of the applicants' original disclosure, or the counting of displays of banners or other information, as recited in applicants' dependent claims 55, 57, 80, 81, and 82 and discussed throughout applicants' original disclosure.

The Patent Examiner is requested to reconsider his rejections in light of the amendments and explanations above and to grant an early allowance. If any questions remain to be resolved, the Patent Examiner is requested to contact applicants' attorney at the telephone number listed below.

Respectfully submitted,

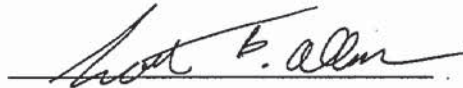


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Dated: 9/3/99

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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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08/258,650 05/19/97 GRIFFITHS M 18022-001

LM02/1227

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EXAMINER

DINH, D

ART UNIT PAPER NUMBER

2757

DATE MAILED: 12/27/99

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

Responsive to communication(s) filed on 9-7-99

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s); or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims:

Claim(s) 1, 2, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

Claim(s) 1, 3-12, 14-25, 27-41, 43-82 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All  Some\*  None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of Reference Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s) \_\_\_\_\_

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

Dung C. Dinh  
Primary Examiner

- SEE OFFICE ACTION ON THE FOLLOWING PAGES -

Serial Number: 08/858,650  
Art. Unit: 2757

-2-

DETAILED ACTION

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-82 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the general concept of not caching the first request signal, does not reasonably provide enablement for the new limitation "signal cannot be blocked ...", "signal cannot be prevented from being received ...", "signal is not blockable ...", etc. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The specification discloses that it is preferred that the first request signal is not blocked by the caching process. There is no teaching of how one can implement the system such that the signal is not blockable or cannot be blocked as claimed. There are many ways, both legitimate and illegitimate

Serial Number: 08/858,650  
Art Unit: 2757

-3-

means, to block a request signal from reaching a server over a communication network. A system can be programmed to bypass the cache and/or to always send a certain type of request directly to the intended server; but no system can guarantee that a signal cannot be blocked from reaching the server.

The following claim number 1 from U.S. Patent No. 5,948,061 is suggested to applicant under 35 U.S.C. 135(a) for the purposes of an interference:

A network comprising:  
a user node having a browser program coupled to said network, said user node providing requests for information on said network;  
a content provider affiliate node having a respective affiliate web site responsive to requests for information from said user node to provide media content, advertising space for display of advertising content and a link message to said user node;  
an advertiser node having an advertiser web site including advertising content, said advertiser node responsive to a request to provide said advertising content; and  
an advertisement server node responsive to a request from said user node based on said link message to select an advertiser node as a selected advertiser node, and identify said advertiser node as said selected advertiser node to said user node,  
whereby said advertising content from said selected advertiser node is displayed at said user node.

The suggested claim must be copied exactly, although other claims may be proposed under 37 CFR 1.605(a).

Applicant is given ONE MONTH or THIRTY DAYS, whichever is longer, from the mailing date of this communication to copy this patent claim. Failure to do so will be considered a concession that the subject matter of this claim is the prior invention of



Serial Number: 08/858,650  
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another under 35 U.S.C. 102(g), and thus also prior art under 35 U.S.C. 103(a) (In re Oguie, 517 F.2d 1382, 186 USPQ 227 (CCPA 1975)), but will not result in the abandonment of this application. THE PROVISIONS OF 37 CFR 1.136 DO NOT APPLY TO THE TIME SPECIFIED IN THIS ACTION.

Applicant need not respond to the remaining issues in this action if a suggested claim is copied for the purpose of an interference within the time limit specified above (37 CFR 1.605(b)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Dinh whose telephone number is (703) 305-9655. The examiner can normally be reached on Monday-Thursday from 7:00 AM - 4:30 PM. The examiner can also be reached on alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached at (703) 305-4792.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks  
Washington, DC 20231

or faxed to:

(703) 308-9051, (for formal communications intended for entry)  
(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

  
Dung C. Dinh  
Primary Examiner



FORM PTO-892		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 08/858,650	GROUP ART UNIT 2153 <del>2757</del>	ATTACHMENT TO PAPER NO. 12
NOTICE OF REFERENCES CITED				APPLICANT(S) Griffiths et al.		
<b>U.S. PATENT DOCUMENTS</b>						
*		DOCUMENT NO.	DATE	NAME	CLASS	FILING DATE
	A	5,948,061	09/07/1999	Merriman et al.	709	219 10/29/1996
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
<b>FOREIGN PATENT DOCUMENTS</b>						
*		DOCUMENT NO.	DATE	COUNTRY	NAME	SUB-CLASS
	L					
	M					
	N					
	O					
	P					
	Q					
<b>OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)</b>						
	R					
	S					
	T					
	U					
EXAMINER D. Dinh			DATE December 20, 1999		Form 892ccs2106b	
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05(a).)						

#2757



AMENDMENT TRANSMITTAL LETTER, Under Small Entity Status Attorney Docket No: 413 18022.001 SSK

Application Serial Number: 08/858,650 Filing Date: 19 May 1997 Examiner: Dinh, D. Group Art Unit: 2757

Invention: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS: Transmitted herewith is an amendment in the above-identified application. The fee has been calculated as shown below.

CLAIMS AS AMENDED

Table with 7 columns: CLAIMS REMAINING AFTER AMENDMENT, HIGHEST NUMBER PREVIOUSLY PAID FOR, NO. OF EXTRA CLAIMS PRESENT, RATE, ADDITIONAL FEE. Rows include TOTAL CLAIMS (78) and INDEP. CLAIMS (9).

X Petition is hereby made under 37 CFR 1.136(a) to extend the time for response to the Office Action of 12/27/1999 to and through 6/27/2000, comprising an extension of the shortened statutory period of:

- one month (\$55)
two months (\$190)
X three months (\$435)
four months (\$680)

TOTAL ADDITIONAL FEE FOR THIS AMENDMENT \$435

- X Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.
A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.
X A check in the amount of \$435 is attached.
Charge \$ to Deposit Account
No additional fee is required.

27 June 2000 Date

Daniel N. Fishman Reg. No. 35512

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I hereby certify that this correspondence and all correspondence identified as accompanying this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on 27 June 2000.

Daniel N. Fishman

Reg. No. 35512

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#14/B  
SSK  
7-10-00

Applicants: Michael J. Griffiths  
James D. McElhiney



Serial No.: 08/858,650

Filing Date: May 19, 1997

Title: Information Storage and Delivery Over a  
Computer Network Using Centralized Intelligence  
To Monitor and Control the Information Being  
Delivered

Group Art Unit: 2757

Examiner:  
Dung Dinh

Our File No.: 18022-001

AMENDMENT UNDER 37 C.F.R. § 1.111

To: Box Fee Amendment  
Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

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TECH CENTER 2700

Dear Sir:

In response to the Patent Examiner's Office Action, Paper No. 12, dated 27 December  
1999, please amend the above-identified patent application, as follows:

In the Claims:

1. (Twice Amended) A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising:
  - servicing a first portion of information to a terminal, wherein said first portion of information contains a reference to a second portion of information;

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causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal [cannot be blocked] includes information intended to prevent said first request signal from being blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;

81  
sending a location signal from the primary server to the terminal providing said location address of said second portion of information;

causing a second request signal to be transmitted from the terminal containing said location address of said second portion of information and requesting said second portion of information be served to the terminal; and

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serving said second portion of information to the terminal.

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<sup>20</sup>  
~~18.~~ (Twice Amended) A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a document served to the device, wherein the banner is stored in one or more servers, comprising:

82  
receiving a first banner request signal from a device at a first server requesting that a banner be served to the device, wherein said first banner request signal [cannot be blocked] includes information intended to prevent said first banner request signal from being blocked from reaching said first server by the device despite previous caching of



said specified banner in the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

receiving a second banner request signal from the device at said second server requesting that the second server serve said specified banner to the device.

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<sup>34</sup>/<sub>27</sub> (Twice Amended) A method for enabling a web page and an associated banner to be served to a computer, wherein the web page contains a link or other reference to the banner, comprising:

serving a web page to a computer;

causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes a Uniform Resource Locator address for said primary server and wherein said banner request signal [cannot be blocked] includes information intended to prevent said banner request signal from being blocked from being received by the primary server as a result of previous caching of the banner on the computer;

determining which specified banner will be served to the computer; and

sending a banner location signal from said primary server to the computer, wherein said banner location signal includes the Uniform Resource Locator address for a device on which the specific banner to be served to the computer is stored.

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~~43~~  
~~36.~~

(Twice Amended) A method for distributing a banner over a computer

network to a device when the banner is referenced or linked to in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising:

receiving a first banner request signal from the device at a first server requesting that a banner be served to the device, wherein said first banner request signal [cannot be blocked] includes information intended to prevent said first banner request signal from being blocked by the device or an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device;

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determining if said first server is best suited to serve said banner to the device and serving said banner to the device if said first server is best suited to serve said banner and, if said first server is not best suited to server said banner to the device, sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server;

receiving a second banner location request signal from the device at said second server requesting that said second server serve said specified banner to said device if said first server is not best suited to server said banner to the device; and

serving said specified banner to said device from said second server if said first server is not best suited to server said banner to the device.

~~49~~  
~~37.~~

(Twice Amended) A method for enabling distribution of a banner over a

computer network to a device when the banner is referenced in a document served to the device,

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wherein the banner is stored in one or more servers connected to the computer network, and the device is connected to the computer network via an intermediary server, comprising:

causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal [is not] includes information intended to make said first banner request signal not blockable by the device or the intermediary server as a result of a storage in the device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device;

34  
sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for said requested banner stored on a second server; and

determining if said requested banner is stored on the device and, if said requested banner is not stored on the device, then causing a second banner request signal to be transmitted from the device to the intermediary server and determining if said requested banner is stored on the intermediary server, wherein if said requested banner is not stored on the intermediary server, causing at least a portion of said second banner request signal to be sent to said second server requesting that said second server serve said requested banner to said device.

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43. (Amended) A method for serving a banner to a client device, comprising:

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receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request [cannot be

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prevented from being received by] includes information intended to prevent said first request from being blocked from the primary server despite previous storage of the banner on the client device;

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sending a signal from the primary server to the client device that includes at least a portion of a second URL associated with the banner's location;

receiving at the primary server a second TCP/IP compliant request requesting that the banner be served to the client device if the banner is not stored on the client device;

serving the banner to the client device; and

counting at least one display of the banner on the client device.

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48. (Amended) A method for enabling accurate counting of displays of a banner on a client device, comprising:

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receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request [cannot be prevented from being received by] includes information intended to prevent said first banner request signal from being blocked from said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary device;

sending a banner location signal to the client device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

causing a determination of whether said specified banner is stored on the client device and, if said specified banner is not stored on the client device, receiving a second banner request signal from the client device at said intermediary device and causing a



B6

determination of whether said specified banner is stored on said intermediary device, wherein if said specified banner is not stored on said intermediary device, receiving a third banner request signal at said second server requesting that said second server serve said specified banner to the client device.

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56. (Amended) A method for serving a banner to a client device, comprising:

receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal [cannot be prevented from being received by] includes information intended to prevent said first request signal from being blocked from the primary server as a result of previous caching of the banner in the client device;

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sending a signal from the primary server to the client device that includes a second URL associated with the banner's location;

receiving a second request signal requesting that the banner be served to the client device if the banner is not stored on the client device; and

serving the banner to the client device.

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76. (Amended) A method for enabling a banner to be received at a client device,

comprising:

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generating at the client device a first request signal for a banner;

transmitting said first request signal to a server, wherein said first request signal [cannot be prevented from being received by] includes information intended to prevent

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said first request signal from being blocked from the server as a result of previous caching of the banner on the client device;

receiving at the client device a response signal from the server that includes a URL associated with the banner's location; and

transmitting a second request signal from the client device requesting that the banner be served to the client device.

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REMARKS

In the Office Action, Paper No. 12, dated 27 December 1999, the Patent Examiner rejected all pending claims under 35 U.S.C. § 112, first paragraph as not enabling. The Patent Examiner also suggested to the Applicants under 35 U.S.C. § 135(a) that claim 1 from United States Patent Number 5,948,061 be copied for purposes of an interference.

Applicants traverse the rejection of all claims as not enabled. Applicants further traverse the Examiner's suggestion to copy claim 1 of the identified patent for purposes of an interference.

Applicants have amended independent claims 1, 16, 27, 36-37, 43, 48, 56 and 76 in response to the Examiner's § 112 rejection in hopes of advancing the prosecution of this patent application.

**§112 Rejection**

The Examiner rejected all remaining claims 1, 3-12, 14-25, 27-41 and 43-82 under 35 U.S.C. § 112, first paragraph as not enabling. The Examiner suggests that although the specification enables the general concept of not caching the first request it does not enable the claimed feature wherein the signal *cannot* be blocked. The Examiner suggests that although the specification teaches that it is preferred that the signal not be blocked there is no teaching to implement a system such that the signal is *not blockable* or *cannot* be blocked as claimed. The Examiner notes that there are many legitimate and illegitimate means to block a request from reaching an intended server and that no system can guarantee that a signal *cannot be blocked* in view of all such means.

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Applicants heartily disagree with the Examiner's suggestion that the specification fails to enable the claimed feature wherein the signal cannot be blocked. The specification starting at page 34, line 1 through page 37, line 4 teaches a multitude of techniques for assuring that the request signal will not be blocked from the intended server. The specified techniques include:

- Use of HTTP standard temporary redirect
- Use of HTTP standard response tags in the server responses including:
  - Expiry tag to specify a latest valid date of the response
  - Last-modified tag to specify the valid date of the response
  - Cache-control tags to indicate that the response is not cachable
  - pragma:no-cache tags to indicate that the response is not cachable
- Use of variable components in the links used by the terminal to request a response

such as:

- a random number
- a time/date stamp
- a cgi-bin string
- a random page identifier
- Use of a URL link that, though constant, appears to the terminal and intermediate servers to be constantly changing

This extensive (though not exhaustive) list enables one of ordinary skill in the art to practice the invention as claimed such that such request is not blocked by normal HTTP standard compliant terminals or proxy servers (or other intermediate nodes).

The Examiner appears to suggest that since not every unknown, non-standardized



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technique for blocking a signal from reaching its intended server is addressed by such a list, the Applicants have not enabled the claimed feature of preventing blocking of the signal. Such theoretical extensions are inappropriate to suggest that the Applicants have not enabled one of ordinary skill in the art to practice the invention. The Applicants extensive list presents a number of equivalent methods to prevent blocking of the request signal by presently known HTTP compatible systems, terminals and browsers. The Examiner merely speculates that other unspecified techniques, including illegitimate techniques, may still be capable of blocking such a message.

In view of the above discussion, Applicants suggest that the rejected claims are in fact enabling for one of ordinary skill in the art to practice the invention as claimed.

However, in hopes of advancing the prosecution of this patent application, Applicants have amended the independent claims to remove the phrasing of concern to the Examiner. In particular, the term "*cannot*" has been removed from all independent claims. Rejected claim 1 for example has been amended to recite that the "first request signal includes information intended to prevent said first request signal from being blocked from reaching said primary server." The absolute term "*cannot*", found not to be enabled by the Examiner, is in essence replaced by language indicating that the signal is structured in a manner *intended* not to be blocked by caching operations of the terminal or intermediate servers. Similar amendments have been made to other independent claims of the subject application.

Applicants strongly disagree with the Examiner's rejection of the claims as not enabled but have made these amendments to advance the prosecution of the subject application.

In view of these amendments and the above discussion, Applicants respectfully request

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reconsideration and withdrawal of the rejection of all claims under 35 U.S.C. § 112 as not enabled.

### **Suggested Interference**

The Examiner suggested copying of claim 1 of patent 5,948,061 (hereinafter the '061 patent) for purposes of provoking an interference therewith. Applicants declined the Examiner's invitation in view of notable distinctions between the claimed inventions and the lack of support for the claim to be copied by the specification of the subject application. Admittedly the claimed invention of the subject application and that of suggested claim 1 of the '061 patent both relate to Internet advertising but that is the extent of the similarity in the claimed invention. The claimed invention of the subject application and that of suggested claim 2 of the '061 patent are directed to very different subject matter and the specification of the subject application cannot support the suggested claim 1 of the '061 patent.

First and foremost Applicants note that all claims of the subject application are directed to specific *methods* of delivering network content to a requesting terminal. By contrast, suggested claim 1 of the '061 patent is directed to an *apparatus* -- a particular structure of systems that cooperate to deliver requested network content and advertising. In this sense the subject application and the '061 are directed to fundamentally different inventions.

Further, claim 1 of the '061 patent, though seemingly broad, none the less recites specific structure not found in a reasonable reading of the specification of the subject application. For example, Applicants do not find support in the subject application for the combination of several nodes recited in the suggested claim 1 of '061. Specifically the subject application does not

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support a combination of servers/nodes as recited in claim 1 of '061 including at least a user node, a content provider having an affiliate web site, an advertising node having an advertiser web site and an advertisement server node. In this sense as well the subject application and the '061 are directed to different inventions. The specification of the subject patent application cannot therefore support the suggested claim 1 of the '061 patent.

Still further, the claimed invention of the subject application is directed to methods simply not taught or reasonably suggested by the '061 patent. For example, one glaring distinction is the very recitation that is the subject of the Examiner's § 112 rejection discussed above. Namely, the '061 patent does not teach or reasonably suggest that the request cannot be blocked from transmission to the intended server by the requesting terminal or by intermediate nodes. In this sense also, the invention of the subject application is very different than that of suggested claim 1 of the '061 patent.

In view of the above discussion, Applicants strongly assert that the subject application and the '061 patent are *not* directed to the same invention. Applicants respectfully request reconsideration and withdrawal of the Examiner's suggestion that claim 1 of the '061 is supportable by the specification of the present invention and therefore be copied in accordance with 35 U.S.C. § 135 to provoke an interference.

Despite Applicants refusal to copy the suggested claim for purposes of an interference and in view of the above discussion, Applicants explicitly deny that the '061 patent is relevant prior art with respect to consideration under 35 U.S.C. §§ 102 and 103. Further, the Examiner has not indicated any reading of the teachings of the '061 patent that suggest it is relevant art with respect to the claims of the subject application. Applicants reserve the right to more



thoroughly discuss the relevance of the '061 patent should the Examiner attempt to apply the '061 patent as a reference under 35 U.S.C. §§ 102 or 103.



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**Conclusion**

The Patent Examiner is requested to reconsider and withdraw his rejection in light of the explanations above. The Examiner is further requested to withdraw his request for copying of a claim pursuant to 35 U.S.C. § 135 in view of Applicants position that the specification of the subject application lacks support for such a claim. If any questions remain to be resolved, the Patent Examiner is requested to contact applicants' attorney at the telephone number listed below.

Respectfully submitted,

Daniel N. Fishman, Reg. No.: 35,512  
CHRISMAN, BYNUM & JOHNSON, P.C.  
1900 Fifteenth Street  
Boulder, Colorado 80302  
Tel: (303) 546-1300

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JUL 7 2000  
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Dated: 27 JUN 2000

**CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8**

I hereby certify that the attached AMENDMENT UNDER 37 C.F.R. § 1.111 is being deposited with the United States Postal Service, first class postage prepaid, in an envelope addressed to Assistant Commissioner for Patents, Washington, DC 20231, on this 27<sup>th</sup> day of June 2000.

Daniel N. Fishman



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

JD

PR

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/858,650	05/19/97	GRIFFITHS	M 18022-001

LM02/1002

SCOTT B ALLISON  
CHRISMAN BYNUM AND JOHNSON  
1900 FIFTEENTH STREET  
BOULDER CO 80302

EXAMINER

DINH, D

ART UNIT	PAPER NUMBER
2757	15

DATE MAILED: 10/02/00

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

Commissioner of Patents and Trademarks

JD

<b>Office Action Summary</b>	<b>Application No.</b> 08/858,650	<b>Applicant(s)</b> GRIFFITHS ET AL.	
	<b>Examiner</b> Dung Dinh	<b>Art Unit</b> 2757	

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

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

1)  Responsive to communication(s) filed on 03 July 2000.

2a)  This action is FINAL.                      2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)  Claim(s) 1,3-12,14-25,27-41 and 43-82 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1,3-12,14-25,27-41 and 43-82 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

11)  The proposed drawing correction filed on \_\_\_\_\_ is: a)  approved b)  disapproved.

12)  The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

13)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)  All   b)  Some \*   c)  None of the CERTIFIED copies of the priority documents have been:

1.  received.

2.  received in Application No. (Series Code / Serial Number) \_\_\_\_\_.

3.  received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

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

14)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. & 119(e).

**Attachment(s)**

15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____
16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
17) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	20) <input type="checkbox"/> Other:

Serial Number: 08/858,650  
Art Unit: 2757

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#### DETAILED ACTION

The amendment filed 7-3-00 is effective to overcome the U.S.C. 112 1<sup>st</sup> paragraph rejection in the prior office action (paper #12).

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

All pending claims are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-49 of U.S. Patent No. 6,014,698. Although the conflicting claims are not identical, they are not patentably distinct from each other because all limitations recited in the claims of the current application are within the limitations of the claims of the patent 6,014,698.



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 Art Unit: 2757

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Claim 1 of present application:	Claim 1 of patent 6,014,098
<p>A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising:</p>	<p>A method for delivering information to a terminal connected to a computer network, wherein information delivered over the computer network from a primary server to the terminal contains references to other information to be delivered to the terminal from the primary server or from one or more other servers connected to the computer network, comprising:</p>
<p>serving a first portion of information to a terminal, wherein said first portion of information contains a reference to a second portion of information; sending a location signal from the primary server to the terminal providing said location address of said second portion of information;</p>	<p>serving a first portion of information to the terminal, wherein said first portion of information contains a reference to a second portion of information;</p>
<p>causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal [cannot be blocked] includes information intended to prevent said first request signal from being blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;</p>	<p>sending a first request signal from the terminal to the primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal cannot be blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching or storing of said first portion of information or said second portion of information by the terminal or said intermediary device; sending a location signal from the primary server to the terminal providing said location address of said second portion of information; and</p>
<p>causing a second request signal to be transmitted from the terminal containing said location address of said second portion of information and requesting said second portion of information be served to the terminal; and serving said second portion of information to the terminal.</p>	<p>determining ... sending a second request signal from the terminal containing said location address of said second portion of information and requesting that said second portion of information be served to the terminal ...</p>

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Dinh whose telephone number is (703) 305-9655. The examiner can normally be reached on Monday-Thursday from 7:00 AM - 4:30 PM. The examiner can also be reached on alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached at (703) 305-4792.

Serial Number: 08/858,650  
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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks  
Washington, DC 20231

or faxed to:

(703) 308-9051, (for formal communications intended for entry)

(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).



Dung Dinh  
Primary Examiner  
September 20, 2000

<b>Notice of References Cited</b>	Application/Control No. 08/858,650	Applicant(s)/Patent Under Reexamination GRIFFITHS ET AL.	<b>D</b>
	Examiner Dung Dinh	Art Unit 2757-2153	

**U.S. PATENT DOCUMENTS**

*		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	DOCUMENT SOURCE **	
							APS	OTHER
<input type="checkbox"/>	A	6,014,698 ✓	Jan. 2000	Griffiths	709	224	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	B	6,115,742 ✓	Sep. 2000	Franklin et al.	709	224	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	C	6,038,601 ✓	Mar. 2000	Lambert et al.	709	226	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	D						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	E						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	F						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	G						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	H						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	I						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	J						<input type="checkbox"/>	<input type="checkbox"/>
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<input type="checkbox"/>	L						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M						<input type="checkbox"/>	<input type="checkbox"/>

**FOREIGN PATENT DOCUMENTS**

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS	DOCUMENT SOURCE **	
								APS	OTHER
<input type="checkbox"/>	N							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	O							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	P							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Q							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	R							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	S							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	T							<input type="checkbox"/>	<input type="checkbox"/>

**NON-PATENT DOCUMENTS**

*		DOCUMENT (Including Author, Title Date, Source, and Pertinent Pages)	DOCUMENT SOURCE **	
			APS	OTHER
<input type="checkbox"/>	U	Goldberg et al., "Beyond the Web: Excavating the Real world via Mosaic", Second International WWW Conference, 1994. Source: Internet, retrieved 5/2/96 from <a href="http://www.usc.edu/dept/raiders/paper/">http://www.usc.edu/dept/raiders/paper/</a>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	V		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	W		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	X		<input type="checkbox"/>	<input type="checkbox"/>

\*A copy of this reference is not being furnished with this Office action. (See Manual of Patent Examining Procedure, Section 707.05(a).)

\*\*APS encompasses any electronic search i.e. text, image, and Commercial Databases.

U.S. Patent and Trademark Office

PTO-892 (Rev. 03-98)



# Beyond the Web: Excavating the Real World Via Mosaic

## THE MERCURY PROJECT.

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(To appear in the Second International WWW Conference, Chicago, IL, Oct 17-21, 1994.)

## Abstract

*This paper describes a Mosaic server that allows users to "leave the Web" and interact with the real world. An interdisciplinary team of anthropologists, computer scientists and electrical engineers collaborated on the project, designing a system which consists of a robot arm fitted with a CCD camera and a pneumatic system. By clicking on an ISMAP control panel image, the operator of the robot directs the camera to move vertically or horizontally in order to obtain a desired position and image. The robot is located over a dry-earth surface allowing users to direct short bursts of compressed air onto the surface using the pneumatic system. Thus robot operators can "excavate" regions within the environment by positioning the arm, delivering a burst of air, and viewing the image of the newly cleared region. This paper describes the system in detail, addressing critical issues such as robot interface, security measures, user authentication, and interface design. We see this project as a feasibility study for a broad range of WWW applications.*

## Goals of the Project

WWW and Mosaic[1]-like servers provide a multi-media interface that spans all major platforms. Thousands of sites have been set up in the past year. Our goal with this project was to provide public access to a teleoperated robot, thus allowing users to reach beyond the digital boundaries of the WWW.



Such a system should be robust as it must operate 24 hours a day and it should be low in cost (we had an extremely limited budget). It is worth noting that the manufacturing industry uses the same criteria to evaluate robots for production. Thus our experience with RISC robotics (see below) proved helpful.

Our secondary goal was to create an evolving WWW site that would encourage repeat visits by users to collectively solve a puzzle. As of this writing we do not have sufficient data to report on the success of the "puzzle" component; therefore this paper focuses on the details of the implementation. We also speculate on how Mosaic might be used for other tele-operated applications.

## Related Work

The first "teleoperated robots" were developed over 30 years ago. The basic objective has always been to develop systems capable of working in inhospitable environments (such as radiation sites). Teleoperation began with very simple mock-ups in nuclear power plants [Mos], progressing to more versatile setups for teleoperation of robots in space [Miz]. Over the last 20 years, the development of intuitively operable teleoperation tools has continued to play an important role in the development of robotics in general. The basic objectives have remained the same, even though the methods and technical limitations have changed.

Today, sophisticated "Telerobot Operator Control Stations" [Kan] are equipped with stereovideo-displays, "force reflecting hand controllers" and comprehensive video graphics support. The development of teleoperation stations is currently being pushed further with the help of latest graphics workstations to provide so-called "telepresence." Modern telepresence systems, considered to be pushing the frontier of research in this field, are defined as follows [Aki]: "At the worksite, the manipulator has the dexterity to allow the operator to perform normal human functions. At the control station, the operator receives sufficient quantity and quality of sensory feedback to provide a feeling of actual presence at the worksite."

The Mercury Project does not achieve this level of telepresence but provides a limited level of teleoperation. One of our goals was to provide "teleoperation for the masses." Instead of developing a highly sophisticated, multi-million-dollar testbed, we opted for a simple and reliable end-effector on a commercial robot. Combined with an intuitively operable man-machine-interface, the system gives all WWW users access to teleoperation.

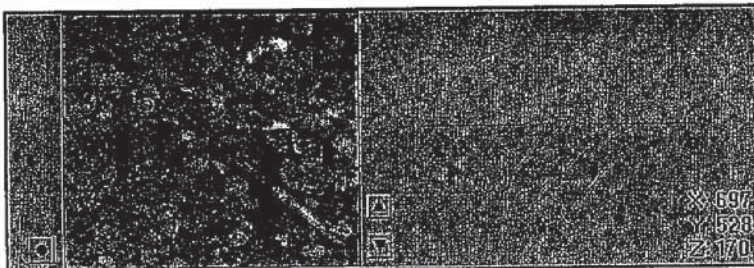
In the Discussion section, we describe a number of other WWW sites that offer interactive capabilities.

## User Interface and Environment Design

The interface design for the system was challenging due to the limitations of the HTML/HTTP environment, as well as network traffic considerations. An effective system was created within such limitations by carefully designing the physical environment for the robot, and by fine-tuning the user-machine interface. For example, the initial idea of a live video feed from the camera was dropped in order to maintain compatibility with all visual clients on the Web. (Although we could have implemented some custom clients [2], we decided to stay within the limits of HTML/HTTP to reach as large a user base as possible, making this a truly global system.) In addition, initial simulations using a robot fitted with grippers (simulated in VIRTUS WALKTHROUGH) revealed a high degree of complexity in control functions [3], not suitable for the anticipated 5-10 seconds per frame page loading time, a 2D Mosaic window and a naive/untrained user.

The team chose instead to use a simple environment which would allow relatively easy control of the robot. Here the analogy taken from real world archaeology - using a dry-earth environment and compressed air bursts - allowed us to simplify the robot control dramatically. Thus users could be quickly trained in the operation of the system, through a simple "Operator's Orientation" and a "Level 1 Clearance Test."

Even with a simplified system, users are still able to choose between fine and gross movements of the arm. Fine pitch movements are executed by clicking in the camera image, with the robot moving to center the arm over the X,Y coordinates of the click-point. Crude navigation is provided by clicking on a schematic picture of the robot and its workspace, with the robot moving to center the arm over the click-point. Two buttons allow navigation in the Z axis (between "up" and "down" positions), with a button to blow air only active when at the Z=0 (i.e., "down") position.



(Click to see an animated robot operation session in MPEG - 175K)

Other features of the system were designed to balance functionality with user needs. All HTML documents sent to the clients are carefully designed to minimize network traffic in order to get a high refresh rate. For example, control panel functions are clearly distinguished from text-based information documents. The Operator's Log was



implemented to create a forum for collaborative efforts to solve the puzzle/problem regarding the underlying logic which links the artifacts. (The Operator's Log is readable throughout the system but only writeable after completing an operating session.) A second entry path was also created to the system, which provides a "back-story" explaining the project while also hinting at possible "real world" uses of the system.

## Access to the Robot

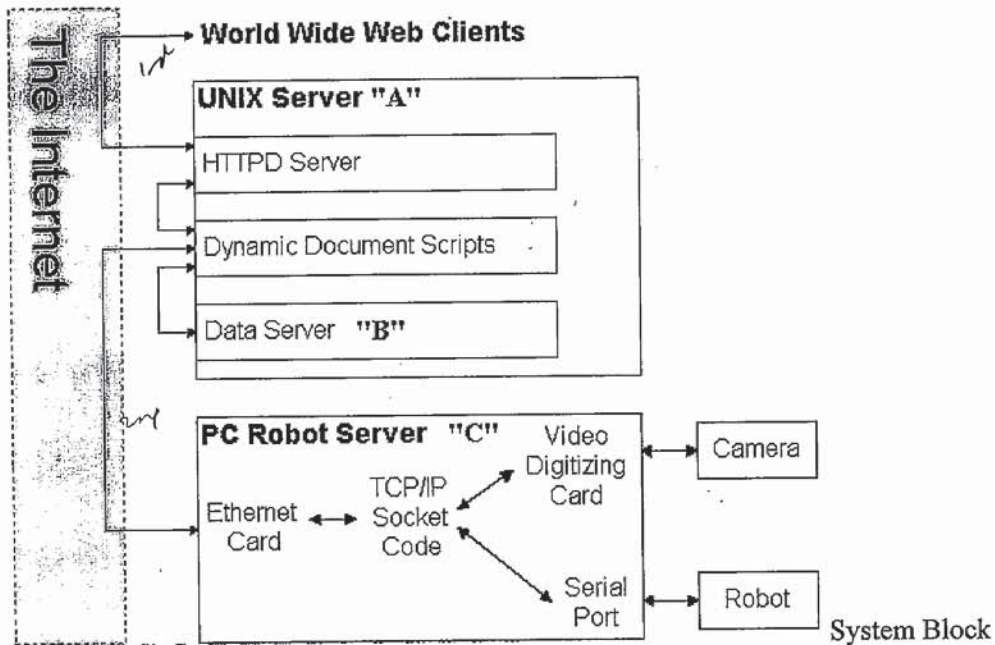
Most of the HTML documents seen by the user on our site are generated by a script running on the WWW server. Using a random token scheme described below, the system tracks each user as he or she proceeds through the interface and generates appropriate HTML documents. This allows the system to discriminate between "observers" and "operators" so that it presents only accessible options to each.

To operate the robot, the user must read the information on how to use the control panel, and then complete a level-1 clearance test to get a password. Since only one person can operate the robot at a time, the system maintains a queue of pending operators. A typical user will enter his/her password, and then add him/herself to the queue. Each time update button is clicked, the system updates the queue and returns a current status page. When the user's turn arrives, the screen returned is the live operators' control screen.

## System Architecture

Below is a Block Diagram for the system. We start with an overview that necessarily glosses over many interesting details.

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Diagram

At one end are WWW clients from around the world; at the other end is a robot arm combined with a camera. The robot and camera provide an updated image of the environment, which is combined with a schematic of the robot arm/workspace and control buttons to produce the final GIF image that is send to users.

At any given time there may be dozens of clients interacting with the system. Since there can only be one Operator at a time, one challenge is to keep track of which client is the operator.

The Mercury system is comprised of three communicating servers. The first, call it A, is a standard Mosaic server (NCSA httpd v.1.3, currently running on a Sun SPARCserver 1000, with SunOS Release 5.3. When the RTE Site is requested by an observer, the most recent image, which is stored on server A, is simply returned.

The database of registered users is handled by another server, call it B. In our case, Server B runs on the same machine as server A. The database server is custom programmed for this project, but performs fairly standard database functions.

When a client request comes in, Server A communicates with server B. If that client is an Operator, Server A must then communicate with a third server, call it C, that controls the robot. Server C runs on a Pentium-based PC and communicates with servers A and B via



the Internet. Server A decodes the ISMAP X&Y mouse coordinates, and sends them to server C.

On server C, a custom program decodes these coordinates into a robot command and verifies that the command is legal, e.g., within the robot workspace. If it is, this command is then converted into a robot command format which is sent to the robot over a serial line. Once the robot move is completed server C uses the CCD camera to capture a stable 8 bit 192x165 image of the workspace.

Using a simple set of equations for inverse kinematics server C then generates a schematic view of the robot in its new configuration. This schematic is combined with the camera image, and the up, down, and air control buttons to form a new composite image. Server C then compresses this image into GIF format and returns it to Server A, which updates the most recent image and returns it to the Operator client.

## Subsystems

### Random Tokens for Cache Avoidance and User Tracking

Following some complex and unwieldy tests, we implemented a random token scheme for tracking users as they use the system. Each time a URL is returned, a large random number is added to the path (which the NCSA HTTPD 1.3 server splits into the PATH\_INFO environment variable). This "token" serves two purposes:

The first is to prevent the WWW client from caching the robot view. When a document is requested a second time during a session, it is much faster to swap in a local copy of the document rather than going back over the net to retrieve it a second time. Most implementations of Mosaic support such caching at various memory levels. However in our case we want to repeatedly retrieve the URL containing the robot image because it is updated continuously. In brief, we DON'T WANT users to cache this url. The random token makes each request look different and tricks the client into retrieving a fresh version of the document.

The second use for the token is to identify Operators. When an operator logs in with a correct password, the system begins tracking him/her as he/she moves from viewing the robot to being on the operators' queue to operating the robot. Since the same script is used for all views, the token allows the system to customize the result for every user depending on his/her position in the system.

### Scripts

The robot view screen is controlled for the most part by one script at the HTTPD server.

Each call to the main script has a token attached to the URL. The token is decoded by the WWW server, and placed in the PATH\_INFO environment variable. The main script then checks the token with the database server to determine the status of the user. Each check of the database generates a system update to keep the queue moving. The user's status is used to generate the custom system status page.

The robot image itself is only changed by the operator when he or she makes a move. Each image is date and time stamped, so WWW clients that cache the image will only retrieve the image when it changes (since its filename will be different, due to a different time stamp).

Due to the client-server architecture of the World Wide Web HTTPD protocol, The robot system (server) has no way to contact the client except at the client's prompting. From the user's point of view, once he or she gets the robot view screen, there is no way for the server to keep sending updates automatically as the robot is moved by the operator. The screen updates must be driven by the user. Since the user must trigger each update, we wanted to provide a button for doing so, since each web client handles reloading the page differently. Some sites have a "reload" hypertext link to the same page, but this doesn't work for any client that caches pages. If a page is being viewed, hitting reload will just re-display the page from the cache, thus not obtaining a new view from the system. Asking the user to disable his/her cache is also problematic, since not all clients allow this option.

One attempt was made to use a mini-form, since the submit button always calls a script and is not cached. that scheme was eventually dropped, since passing registered user identification information to the server via hidden fields only worked on some clients. Using the random token allows for an elegant interface.

Since the robot can only be controlled by one person at a time, a registration scheme was implemented to allow the server to track operators as they move on to the waiting queue and progress to controlling the robot. Since the server only knows the IP address of each user, some user information had to be incorporated into the HTML robot view document itself for re-transmission to the system when the user hits "reload." There are various techniques used by many sophisticated web systems to accomplish user identification between document requests, but we found some problems in many of the standard solutions. In the end, the random token served excellently as a means of identifying registered users.

A preliminary attempt was made to use a small form to identify the user. Hidden fields could hold the user id, but once again, many clients do not implement the hidden field attributes so the interface is cluttered by unnecessary fields. Putting the user's id information into the ACTION field of the form tag is also client dependent. Unfortunately, some clients strip that data before adding the encoded field information.



Since random tokens were already being passed with each update, the system was extended to track the tokens of each registered user. Each time the script is called, the token is exchanged for a new one, and the database is updated with the new token for registered users. One side effect is that the user can not use the client re-load button, since this will not use the new URL (it is embedded in the update HREF).

## The Data Server

The data server ("B") is a custom Perl script that handles all of the database work for the project. It continuously runs as a TCP/IP listener, waiting for database transactions from the other system scripts. The data server runs as a single process, handling requests serially to maintain internal data integrity. Typically, transactions are very short, since the data is kept in main memory. The data server could be replaced by an off-the-shelf transaction based DB system in the future. A time-out is set to close the connection if there is too much time elapsed between commands. This was implemented because some WWW clients would crash in the middle of a document request, leaving the system waiting for the connection to be closed.

## Internal Network Interface

The networking functionality required by the project was defined by two factors. On one hand, the camera that we purchased required a PC-based platform running an Microsoft DOS or compatible operating system to run on Server C. On the other hand, the expected load of client requests required a machine capable of more heavy networking duties such as a Sun workstation (Server A). Currently Server A is located across campus from server C.

These servers are connected via Ethernet. Each machine has its own IP address and resides in the usc.edu domain. Communication is achieved using a socket connection between the two machines. The implementation on Server A was done using the standard BSD socket functions provided with the SunOS 4.1 operating system and Perl. On Server C we used a publicly available socket package called Waterloo TCP and Borland C. The Waterloo TCP package was obtained from the ftp site dorm.rutgers.edu in the file /pub/msdos/wattcp/wattcp.zip.

With this software Server A can request a socket connection to Server C to establish a connection. The first step in obtaining a new image is for Server A to write a command consisting of thirty bytes which encodes the (xy) coordinates of the ISMAP event. After Server C completes the moves and generates the new image, it writes the size of the new image to server A so that server A knows exactly how many bytes to expect. Server C then proceeds to write the entire image to the socket and waits for the socket to close to insure deliver of the data. Once server A has read all the specified bytes it closes the

socket. Server C is now ready and waiting for another socket connection. Server A is free to continue processing the Mosaic actions of the current users.

Current-throughput is approximately 20 Kbytes/second, which is poor compared to the 0.5 megabyte per second rate that can be achieved between two Sun workstations in close proximity on the campus network. At this time we feel that the delays are being imposed by the MS-DOS operating system because of its inability to support networking operations and its lack of multitasking abilities, which necessitates busy waiting cycles in the PC software to obtain concurrence between the robotic/camera operations and the networking duties.

Our low data rate is somewhat tolerable because the time for communication between Servers A and C is small compared with Internet delays between clients and server A. One way to speed communication would be to use different methods of image compression such as JPEG to reduce the size of the image. However this may introduce latency due to encoding.

### **The IBM Robot and Server "C"**

The robot we're using is an IBM SR5427 SCARA arm, built around 1980.

SCARA stands for "Selective Compliance Assembly Robot Arm". Robots with SCARA kinematics are common in industrial assembly for "pick-and-place" operations because they are fast, accurate and have a large 2.5D workspace. However, the SCARA arm can only rotate its gripper about the vertical (Z) axis. We selected this robot over other robots in our lab due to its excellent durability, large workspace, and because it was gathering dust in the Robot Education Lab.

The IBM SCARA robot is controlled through a 4800 baud serial port by a custom written C library constructed with reference from IBM's BASIC library distributed along with the robot. The commands sent by the library are simple instructions consisting of instruction id, length, data and checksum. The data length and content varies depending on instruction id. The IEEE floating point format is used to represent the necessary data. This command string is then sent over the serial line to the robot to issue the command.

Unfortunately IBM no longer supports this robot and we were forced to read two antiquated BASIC programs and monitor their serial line transmissions to decipher the protocols needed for serial control of the robot. The robot accepts XYZ and Theta commands using IEEE format and checksums. Server C now runs on a Pentium based PC with all custom code written in Borland C.

The first step was implementing a local graphical user interface to control robot movements and monitor subsequent functions such as network flow. We chose two



views of the workspace: a global schematic view for coarse motions, and a local camera view for fine motions. Note that a click on the camera image requires a different relative move if the camera is in the up or down position. To handle it, we implemented an empirical calibration program.

The major difficulty in implementing Server C was to schedule response to the network, the local mouse, and the image capture board. At first we discussed a multi-tasking environment but, upon further study, we realized we could achieve this cooperation within a single DOS task. Another problem, inherent to DOS based applications, is memory management. This complication was solved by careful usage of memory and by utilizing the screen itself as a memory buffer. This careful usage of memory enabled the custom written GIF encoder to use more memory which, combined with an appropriate hash function, sped the GIF encoding process up to a few microseconds.

In future versions of Mercury, we plan to incorporate a more sophisticated PC-based robot simulation system based on COSIMIR [Fre] from the University of Dortmund.

## Camera

We are using an EDC 1000 digital CCD camera from Electrim Inc. This camera was chosen based on size and cost. Image data is sent from the camera back through a serial line into a video capture card. The picture captured is always 192 by 165 pixels with 256 shades of gray. The image size and gray shades are fixed. Focus and contrast are manually adjusted. Exposure time can be changed by software to range between 1/200 th to 1/64 th of a second. 1/150th exposure was used to reduced light streaking that the camera is prone to.

Although the robot's control system quickly dampens oscillation about the destination point, dynamic effects can cause image blur. Two solutions were implemented. First the robot was slowed down enough as to reduce some of the vibration but not to hinder the robot access speed considerably. Second, once the robot responds positively to an issued command, the camera captures two pictures each at 1/64 th of a second. These two images are compared to determine a factor of similarity. If this factor is below some set value the image is presumed to be stable, otherwise subsequent pictures are taken until the image pair is determined to be stable. More then 5 trials results in a time-out in which case the most current image is used and the program continues. This image comparison procedure reduces movement streaks seen in pictures of moving objects.

Lighting the workspace has been problematic. The work space is primarily luminated by standard florescent ceiling fixtures and augmented by two additional florescent lamps to reduce shadows and raise the overall ambient light levels. We tested a contrast enhancement routine to normalize the lighting of each image captured from the camera. This increased the visual aesthetics of the image but subjected it to drastic light and dark

changes as the robot moved onto different objects with different light reflecting qualities. In response, a global lighting adjustment was implemented but found to reduce certain areas to unacceptable darkness. Certainly a better lighting system is required.

Due to the manual focus adjustment of the camera, the focus adjustment could not be changed between the up and down position of the camera. This resulted in a compromise focus adjustment that is not perfect for the up or down position of the robot arm, but acceptable in both positions.

To decrease compressed image size and thus increase network transfer rate the image is reduced from 256 to 64 gray scales since most systems available can only display 256 colors or 64 shades of gray. Thus the gray scale reduction did not reduce image quality but reduced compressed image size by about 10K.

### **Robustness and Soft Resets**

All robot motions are monitored by Server C. Each command sent to the robot is verified to be within the robot's workspace. Acknowledgments from the robot are monitored to detect errors. When an error is detected, Server C automatically resets the robot controller, recalibrates, and returns the robot to its previous position.

## **Performance**

### **History and Statistics**

Daily statistics are available and may be correlated with project milestones. As of the writing of this paper, the system has been online for over 4 weeks and there are approximately 100 users per day. There is also a list of all hosts that have visited the system. As of this writing the system has been visited by hosts from all of the major continents except the polar caps.

### **Refresh Rates via Ethernet**

System response time seems to be mostly dependent on network link speeds. Locally, we get screen refreshes at rates of 5-10 seconds per page. Similar response times have been reported from Europe. Obviously, a slow local link or SLIP connection will drastically affect the update speed, since the robot control image is essential to the system. Updates are also strongly affected by the speed of the WWW client application.

### **Uptime**

The system is designed for 24 hour use. The WWW server scripts are generally



modified, tested and then loaded into the running system. Background programs monitor the system and notify the team members if there are problems.

### **Operators' Logs**

When an operator has finished driving, he or she is prompted to make a textual entry into an "Operator's log". The Operator's log provides an ongoing forum for discussion of the system and record of artifacts discovered in the sand.

For example, several skeptics have claimed that the system is an elaborate hoax where all images are taken from a prestored library (much like the celebrated Apollo Moonwalk hoax of 25 years ago). We have had encouraging comments from the robotics community, including several researchers at NASA.

### **Discussion and Future Applications:**

This project is an initial step in an ongoing educational and research project at the University of Southern California. It brings together faculty and students of different backgrounds to collaborate in the design and implementation of a networked system that combines robotics with archaeology and interactive art.

This system exemplifies RISC Robotics, which advocates Reduced Intricacy in Sensing and Control. The SCARA-type robot requires only 4 axes, is relatively inexpensive and robust, and it is easy to avoid singularities. The end effector we've used here is also about the minimum. For more on RISC as applied to industrial robotics, please see RISC for Industrial Robots: Recent Results and Open Problems, (with J. Canny), 1994 IEEE Conference on Robotics and Automation.

We see the project leading in several directions. For Mosaic and the WWW, the required interface design prompted new developments related to several issues, including user authentication, user queuing and interface security (as discussed above).

For this project we chose a very simple application. The server can be extended to a variety of platforms that permit remote inspection and manipulation of objects -- for example, providing unique and unedited access and views of priceless and otherwise inaccessible resources (a Grecian urn, a Gutenberg Bible, etc.), thus providing an alternative to pre-stored libraries which are limited in terms of perspective, depth of resolution, etc. (Cite Recent NY Times article on the Metropolitan Museum of Art).

Further extensions for this project might include: the robot could be placed out in the field, in a remote anthropological site or on the moon; the camera could be replaced with a scanning electron microscope; or the remote operator could be a doctor examining a



patient or a specialist performing remote inspection or manufacturing. All of these areas also have significant implications for education, as they present the opportunity for virtual "field trips" to a live site while permitting remote manipulation from the classroom.

Anthropologists have conventionally recorded the diverse cultural heritage of humankind by means of varied media: written text, graphics, film, sound and still images. The advantage of a system like the one described in this paper lies in the fact that you do not have to rely on prerecorded media. It enables the user to view and possibly record her or his own "slice of reality". We see the Web as a perfect medium for updating pre-recorded media as described in [Mas] Interactive Education: Transitioning CD-ROMs to the WEB, a paper presented at the First WWW Conference, Geneva 94. Furthermore, we now have the possibility to combine updateable prerecorded media of all sorts with live recordings and live remote interactions. The possibilities of a system that combines global access to up-datable prerecorded media and combines it with the possibility of live remote interactions are just beginning to unfold, and are a central focus of interest for the anthropologists from the E-LAB involved in this project.

In view of other interactive WWW sites, we propose a three-tiered system describing interactively on the WWW. Under Level I, interaction is solely between digital information stored on computers or created by scripts running on such machines, and connected or communicating with the WWW and Mosaic clients. In Level II sites, the clients are able to observe the "real world" by means of a camera observing and digitizing visual and, hopefully soon, audio-visual information. The camera acts as an "eye" for the Web, providing multiple "real world images" from a global theater. A number of Web sites fall into this category, such as the Coffee Pot and the Fishtank sites. All have the same characteristic of passively observing the real world. We also know of one restricted site that allows the user to alter the user's point of view (see LEGO pan and tilt site.)

The Mercury Project introduces a third level. Level III sites reach beyond the digital domain to allow users to alter a remote physical environment. We envision this project as a first glimpse into the possibilities available at Level III. We might also speculate about other levels, which might allow remote users to control a mobile robot and thus "tele-ambulate".

## Footnotes

- [1] To simplify we mention only Mosaic as a WWW client but we are aware of the fact that there are different WWW clients similar to Mosaic, e.g. MacWeb, Cello, etc.
- [2] MBONE broadcasting, REFERENCE to MIT LIVE VIDEO SITE [diversion -

possible fixes to client refresh problem to show we know about the X stuff etc.] There are two possible fixes to this problem, One is to release specially modified clients that set up a two-way communication, the second is to use some other software to display the current system on the user's client workstation. Since many clients are used to view the WWW, making modifications would be difficult, especially since they are being updated all the time. Even if source code could be obtained for every major client, changes would have to be made to every release of all these be on each release of these applications, The second possibility is to write a separate program to run on the clients' workstation. The problem here is to write a robots client that can be released for enough platforms to be useful, Since this would be an esoteric piece of the system, it is not likely that other sites would customize the software for different systems like is done for the major systems. One technique is to use the X windows protocol to display a client application on the users workstation running an X server. (weather, movies) We felt that this would be a limited audience, however. It also may compromise security from the user's point of view. Both these approaches may be attempted in version 2.0 of the system to allow more enhanced use of the system for some users. The HTTPD protocol could be extended to allow these sort of connections, though - maybe we need a new protocol for passing media only back that doesn't have all the hooks into system calls like X Windows and Display PostScript.

[3]

3D control of a robot needs: 3 dimensions of spatial movement, 3 dimensions of orientation and 1 to 3 dimensions of gripper control.

## Acknowledgments

- Rick Lacy, Mark Brown, and the Center for Scholarly Technology,
- Depts. of CS and Anthro,
- Prof. Peter Danzig (CS)
- The alpha and beta testers
- The Laika Foundation
- The Los Angeles Museum of Miniatures

## References

[Aki]

D.L. Akin, M. Minsky, e.a.: "Space Applications of automation, robotics, and machine intelligence systems (ARAMIS)", Phase II, Vol. 3, M.I.T. Contract NASA 8-34381, NASA Marshall Space Flight Center.

[Kan]

E.Kan, J.Tower e.a.: "The JPL Telerobot Operator Control Station: Part 1 - Hardware", Proceedings of the NASA Conference on Space Telerobotics, 1989.





#16 / ext. of time 2  
T. McBeth-B- and 3/14/01

Approved for use through 10/31/2002, CMB 0651-0031  
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) 18022.001	
In re Application of Griffiths et al.			
Application Number	08/858,650	Filed	19 May 1997
For INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED			
Group Art Unit	2757	Examiner	Dinh, D.

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- One month (37 CFR 1.17(a)(1)) \$ 110.00
- Two months (37 CFR 1.17(a)(2)) \$ 390.00
- Three months (37 CFR 1.17(a)(3)) \$ 890.00
- Four months (37 CFR 1.17(a)(4)) \$1,390.00
- Five months (37 CFR 1.17(a)(5)) \$1,890.00

- Applicant claims small entity status. See 37 CFR 1.27. Therefore the fee amount shown above is reduced by one-half, and the resulting fee is: \$ 195.
- A check in the amount of the fee is enclosed.
- Payment by credit card. Form PTO-2038 is attached.
- The Commissioner has already been authorized to charge fees in this application to a Deposit Account.
- The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ I have enclosed a duplicate copy of this sheet.

- I am the
- applicant/inventor
  - assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).
  - attorney or agent of record.
  - attorney or agent under 37 CFR 1.34(a). Registration number if acting under 37 CFR 1.34(a). \_\_\_\_\_

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1 March 2001  
Date

Signature

Daniel N. Fishman  
Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

Total of \_\_\_\_\_ forms are submitted.

Burden Hour Statement: This form is estimated to take 0.1 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

08 MAR 2001 09:05:21 00000012 00058650

195.00 DP





#17 Terminal Disclaimers  
MCSB 158-87  
3/14/01

PTO/SB/26 (10-00)  
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**TERMINAL DISCLAIMER TO OBIATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT**

Docket Number (Optional)  
18022.001

In re Application of: Griffiths, et al.  
Application No.: 08/858,650  
Filed: 19 May 1997

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MAR 1 2001  
TC 2100  
MAIL ROOM

For: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

The owner\*, Matchlogic, Inc., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 to 156 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 6,014,698. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 to 156 and 173 of the prior patent, as presently shortened by any terminal disclaimer. In the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

- 1.  For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 or Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

- 2.  The undersigned is an attorney or agent of record.

Signature

1 March 2001

Date

Daniel N. Fishman

Typed or printed name

- Terminal disclaimer fee under 37 CFR 1.20(d) included.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

\*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this statement. See MPEP § 324.

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55.00 DP

<b>Notice of Allowability</b>	Application No.	Applicant(s)	
	08/858,650	GRIFFITHS ET AL.	
	Examiner	Art Unit	
	Dung Dinh	2153	

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to terminal disclaimer filed 3/5/01.
2.  The allowed claim(s) is/are 1,3-12,14-25,27-41 and 43-82.
3.  The drawings filed on \_\_\_\_\_ are acceptable as formal drawings.
4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All    b)  Some\*    c)  None of the:
    1.  Certified copies of the priority documents have been received.
    2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.
5.  Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION.** This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).


6.  Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7.  Applicant MUST submit NEW FORMAL DRAWINGS
  - (a)  Including changes required by the Notice of Draftsperson's Patent Drawing Review( PTO-948) attached
    - 1)  hereto or 2)  to Paper No. \_\_\_\_\_.
  - (b)  including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the examiner.
  - (c)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.
8.  Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE / SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

**Attachment(s)**

1 <input type="checkbox"/> Notice of References Cited (PTO-892)	2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____
5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____	6 <input type="checkbox"/> Examiner's Amendment/Comment
7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	8 <input type="checkbox"/> Examiner's Statement of Reasons for Allowance
	9 <input type="checkbox"/> Other

  
 Dung Dinh  
 Primary Examiner  
 Art Unit: 2153





UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

**NOTICE OF ALLOWANCE AND ISSUE FEE DUE**

TM02/0406

SCOTT B ALLISON  
CHRISMAN BYNUM AND JOHNSON  
1900 FIFTEENTH STREET  
BOULDER CO 80302

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/858,650	05/19/97	078	DINH, D	2153 04/06/01
First Named Applicant	GRIFFITHS, 35 USC 154(b) term. ext. = 0 Days.			

TITLE OF INVENTION: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
0	18022-001	709-229,000	E59 UTILITY	YES	\$620.00	07/06/01

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

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*June 29, 2001.*

*James R. Young*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants:	Michael J. Griffiths	)	
	James D. McElhiney	)	
Serial No.:	08/858,650	)	
Filing Date:	May 19, 1997	)	Group Art Unit: 2153
Title:	Information Storage and Delivery Over a	)	Examiner:
	Computer Network Using Centralized Intelligence	)	Dung Dinh
	To Monitor and Control the Information Being	)	Our File: 18022-001
	Delivered	)	

**TRANSMITTAL OF ISSUE FEE**

To: Box ISSUE FEE  
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U.S. Patent and Trademark Office  
Washington, DC 20231

Enclosed is Chrisman, Bynum & Johnson check no. 86452 in the amount of \$1,270.00 (\$1,240.00 for Issue Fee and \$30.00 for advance order of patent copies), along with the Issue Fee Transmittal form PTOL-85B (Rev. 10-96) for the above-referenced patent application. Please note that the applicant is no longer entitled to a small entity status. Therefore, the Issue Fee Transmittal form, PTOL-85B (REV.) 10-66), has been corrected to reflect the large entity status along with the appropriate fee.

Dated: *June 29, 2001*

Respectfully submitted,  
*James R. Young*  
James R. Young, Reg. No. 27,847  
CHRISMAN, BYNUM & JOHNSON  
1900 Fifteenth Street  
Boulder, Colorado 80302  
Telephone: (303) 546-1300

PART B—ISSUE FEE TRANSMITTAL

# 19  
8-18-01  
SC

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Washington, D.C. 20231**



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**Certificate of Mailing**

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CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

TM02/0406

**SCOTT B. ALLISON** James R. Young  
CHRISMAN BYNUM AND JOHNSON  
1900 FIFTEENTH STREET  
BOULDER CO 80302

James R. Young (Depositor's name)

*James R. Young* (Signature)

29 June 2001 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/858,650	05/19/97	078	DINH, D	2153 04/06/01
First Named Applicant	GRIFFITHS, 35 USC 154(b) term ext. = 0 Days.			

**TITLE OF INVENTION** INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
0 18022-001	709-229.000	E59	UTILITY	NO	\$1,240.00 \$620.00	07/06/01

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.
- Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1. James R. Young
2. Chrisman Bynum & Johnson
3. \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)  
**PLEASE NOTE:** Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.
- (A) NAME OF ASSIGNEE Matchlogic, Inc.
- (B) RESIDENCE: (CITY & STATE OR COUNTRY) Louisville, CO
- Please check the appropriate assignee category indicated below (will not be printed on the patent)
- Individual  corporation or other private group entity  government

- 4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):
- Issue Fee
- Advance Order - # of Copies 10
- 4b. The following fees or deficiency in these fees should be charged to:
- DEPOSIT ACCOUNT NUMBER: 031725  
(ENCLOSE AN EXTRA COPY OF THIS FORM)
- Issue Fee
- Advance Order - # of Copies 10

The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature) *James R. Young* (Date) 6/29/01

07/09/2001 SHERMAN: 00600169 00650650

01 FC:142 1840.00 IP  
02 FC:561 30.00 IP

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Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

*Ce*



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June 29, 2001

*James R. Young*

#2011

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths	)	
	James D. McElhiney	)	
Serial No.:	08/858,650	)	
Filing Date:	May 19, 1997	)	Group Art Unit: 2153
Title:	Information Storage and Delivery Over a	)	Examiner:
	Computer Network Using Centralized Intelligence	)	Dung Dinh
	To Monitor and Control the Information Being	)	
	Delivered	)	
Our File No.:	18022-001	)	

TRANSMITTAL OF FORMAL DRAWINGS

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c/o Technology Center 2100  
U.S. Patent and Trademark Office  
Washington, D.C. 20231

Dear Sir:

In response to the Notice of Allowance and Issue Fee Due dated April 6, 2001, please find enclosed, along with a separate Letter to the Official Draftsman, three (3) sheets of formal drawings containing figures one through four for the above-referenced patent application.

Respectfully submitted,

CHRISMAN, BYNUM & JOHNSON, P.C.

*James R. Young*

Dated: June 29, 2001

James R. Young, Reg. No. 27,847  
1900 Fifteenth Street  
Boulder, CO 80302  
Telephone: (303) 546-1300





IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths James D. McElhiney	)	
Serial No.:	08/858,650	)	
Filing Date:	May 19, 1997	)	Group Art Unit: 2153
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	)	Examiner: Dung Dinh
Our File No.:	18022-001	)	

**LETTER TO OFFICIAL DRAFTSPERSON TRANSMITTING FORMAL DRAWINGS**

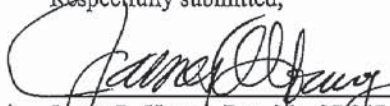
To: Box ISSUE FEE  
c/o Technology Center 2100  
U.S. Patent and Trademark Office  
Washington, DC 20231

Dear Sir/Madam:

Enclosed herewith are three (3) sheets of formal drawings containing figures one through four for the above-referenced patent application.

Respectfully submitted,

Dated: 29 June 2001

  
 \_\_\_\_\_  
 James R. Young, Reg. No. 27,847  
 CHRISMAN, BYNUM & JOHNSON  
 1900 Fifteenth Street  
 Boulder, Colorado 80302  
 Telephone: (303) 546-1300

#B

#19



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Michael J. Griffiths )  
 James D. McElhiney )  
 Serial No.: 08/858,650 )  
 Filing Date: May 19, 1997 ) Group Art Unit: 2153  
 Title: Information Storage and Delivery Over a ) Examiner:  
 Computer Network Using Centralized Intelligence ) Dung Dinh  
 To Monitor and Control the Information Being )  
 Delivered )  
 Our File No.: 18022-001 )

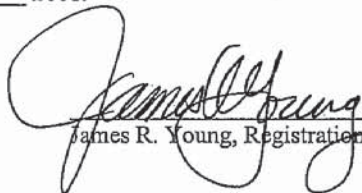
CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

To: Box ISSUE FEE  
 c/o Technology Center 2100  
 U.S. Patent and Trademark Office  
 Washington, DC 20231

The undersigned hereby certifies that the following documents:

1. Certificate of Mailing Under 37 C.F.R. §1.8
2. Form PTOL-85B (Rev.10-96);
3. Chrisman, Bynum & Johnson check no. 86452 in the amount of \$1,270.00 (\$1,240.00 for Issue Fee and \$30.00 for advance order of patent copies);
4. Transmittal of Issue Fee;
5. Transmittal of Formal Drawings;
6. Letter to Office Draftsperson Transmitting Formal Drawings; and
7. Three (3) sheets of formal drawings containing figures one through four; and
8. Return Post Card

are being deposited with the United States Postal Service as first-class mail, postage prepaid, in an envelope addressed to: Box ISSUE FEE, Assistant Commissioner of Patents, Washington, DC 20231, on this 29<sup>th</sup> day of June 2001.

  
 James R. Young, Registration No. 27,847

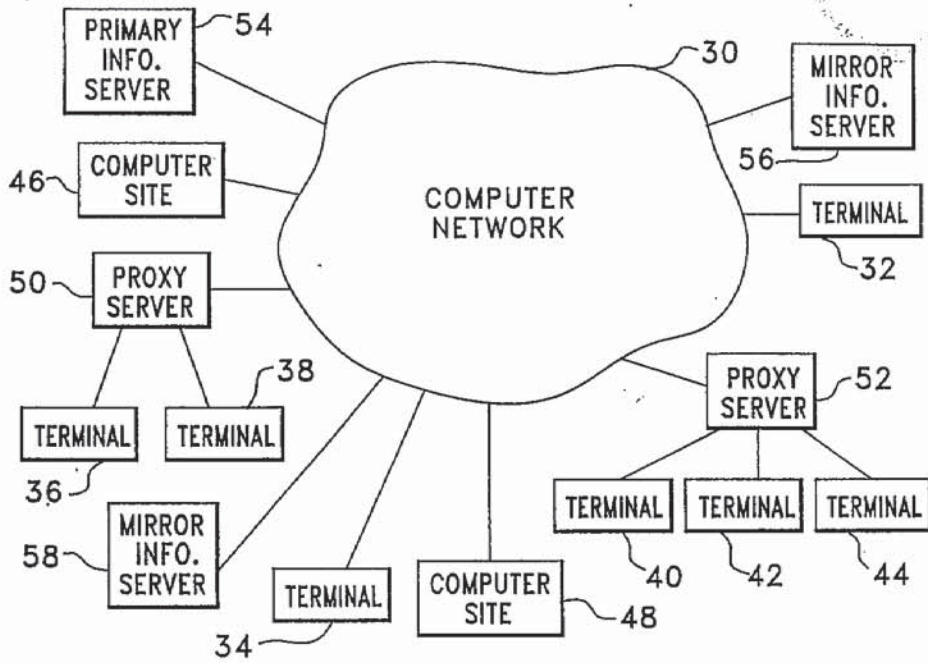


FIG. 1

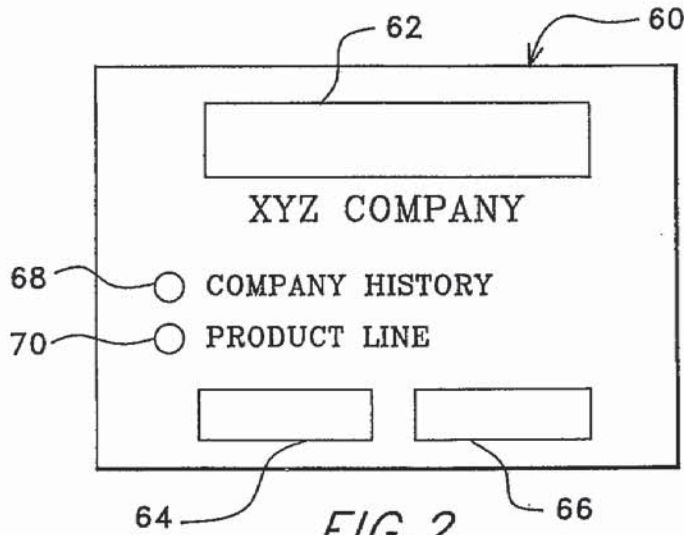


FIG. 2



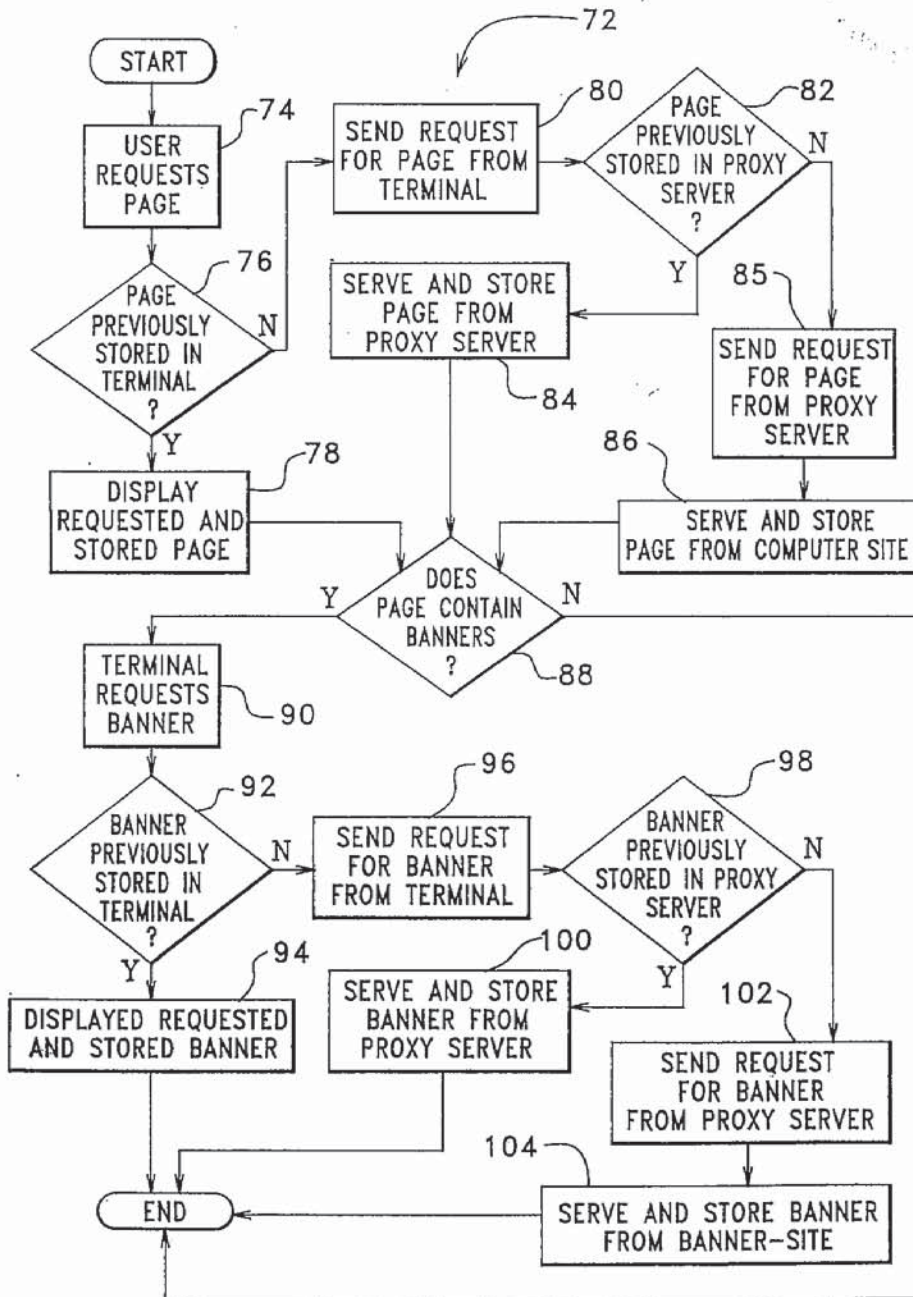


FIG. 3  
(PRIOR ART)





UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

PAYOR NUMBER
28286

P75M

DATE PRINTED

FAEGRE & BENSON LLP
Attn: PATENT DOCKETING
2200 WELLS FARGO CENTER
90 SOUTH 7TH STREET
MINNEAPOLIS MN 55402-3901

10/05/05

NOTICE OF PATENT EXPIRATION

According to the records of the U.S. Patent and Trademark Office (USPTO), payment of the maintenance fee for the patent(s) listed below has not been received timely prior to the end of the six-month grace period in accordance with 37 CFR 1.362(e). THE PATENT(S) LISTED BELOW HAS THEREFORE EXPIRED AS OF THE END OF THE GRACE PERIOD. 35 U.S.C. 41(b). Notice of the expiration will be published in the USPTO Official Gazette.

Expired patents may be reinstated in accordance with 37 CFR 1.378 if upon petition, the maintenance fee and the surcharge set forth in 37 CFR 1.20(i) are paid, AND the delay in payment of the maintenance fee is shown to the satisfaction of the Director to have been unavoidable or unintentional. 35 U.S.C. 41(c)(1).

If the Director accepts payment of the maintenance fee and surcharge upon petition under 37 CFR 1.378, the patent shall be considered as not having expired but would be subject to the intervening rights and conditions set forth in 35 U.S.C. 41(c)(2).

For instructions on filing a petition under 37 CFR 1.378 to reinstate an expired patent, you may call the USPTO Contact Center at 800-786-9199 or 703-308-4357.

Table with 6 columns: PATENT NUMBER, U.S. APPLICATION NUMBER, PATENT ISSUE DATE, APPLICATION FILING DATE, EXPIRATION DATE, ATTORNEY DOCKET NUMBER. Row 1: 6286045, 08858650, 09/04/01, 05/19/97, 09/06/05, 101001





**RECEIVED**  
MAY 12 2006  
OFFICE OF PETITIONS

<b>TRANSMITTAL FORM</b>  <i>(to be used for all correspondence during pendency of filed application)</i>	Patent Number	6,286,045 B1	
	Issue Date	September 4, 2001	
	First Named Inventor	Michael John Griffiths	
	Group Art Unit Number	N/A	
	Examiner Name	Dung C. Dinh	
Total Number of Pages in This Submission	4	Attorney Docket Number	19675-11596

**RECEIVED**  
MAY 12 2006

OFFICE OF PETITIONS

ENCLOSURES <i>(check all that apply)</i>	
<input type="checkbox"/> Fee Transmittal Form (in duplicate)	<input type="checkbox"/> Issue Fee Transmittal
<input checked="" type="checkbox"/> Check Enclosed	<input type="checkbox"/> Letter to Chief Draftsperson
<input type="checkbox"/> Return Receipt Postcard	<input type="checkbox"/> Formal Drawing(s): (Replacement Sheets) [ ] Sheet(s) of Figure(s) [ ]
<input checked="" type="checkbox"/> Petition to Accept Unintentionally Delayed Payment of Maintenance Fee in an Expired Patent	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Declaration	<input type="checkbox"/> Appeal Communication to Group <i>(Appeal Notice, Brief, Reply Brief)</i>
<input type="checkbox"/> Power of Attorney to Prosecute Before the USPTO	<input type="checkbox"/> Certified Copy of Priority Document(s)
<input type="checkbox"/> Statement Under 37 CFR 3.73(b)	<input type="checkbox"/> After Allowance Communication to Group
<input type="checkbox"/> Copy of Assignment	<input type="checkbox"/> _____
<input type="checkbox"/> Request for Corrected Filing Receipt	<input type="checkbox"/> _____
<input type="checkbox"/> Request for Correction of Recorded Assignment	<input type="checkbox"/> _____
<input type="checkbox"/> Amendment: [ ] Page(s) <input type="checkbox"/> After Final	<input type="checkbox"/> _____
<input type="checkbox"/> Status Request	<input type="checkbox"/> _____
<input type="checkbox"/> Revocation and Substitute Power of Attorney	<input type="checkbox"/> _____
REMARKS:	

SIGNATURE OF ATTORNEY OR AGENT		
Signature:		
Attorney/Reg. No.:	Brian M. Hoffman, Reg. No.: 39,713	Dated: May 2, 2006

CERTIFICATE OF MAILING		
<small>I hereby certify that this correspondence, including the enclosures identified above, is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. If the Express Mail Mailing Number is filled in below, then this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service pursuant to 37 CFR 1.10.</small>		
Signature:		
Typed or Printed Name:	Brian M. Hoffman	Dated: 5/2/06
Express Mail Mailing Number (optional):		

20423/01000/SF/5167969.1

DAC



**PETITION TO ACCEPT UNINTENTIONALLY DELAYED PAYMENT OF MAINTENANCE FEE IN AN EXPIRED PATENT (37 CFR 1.378(c))**

Docket Number (Optional)  
20423-11596

**RECEIVED**  
MAY 12 2006  
**OFFICE OF PETITIONS**

Mail to: Mail Stop Petition  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

NOTE: If information or assistance is needed in completing this form, please contact Petitions Information at (703) 305-9282.

Patent No. 6,286,045 B1 Application Number 08/858,650

Issue Date September 4, 2001 Filing Date May 19, 1997

CAUTION: Maintenance fee (and surcharge, if any) payment must correctly identify: (1) the patent number (or reissue patent number, if a reissue) and (2) the application number of the actual U.S. application (or reissue application) leading to issuance of that patent to ensure the fee(s) is/are associated with the correct patent. 37 CFR 1.366(c) and (d).

**Also complete the following information, if applicable**

The above-identified patent:

is a reissue of original Patent No. \_\_\_\_\_, original issue date \_\_\_\_\_;  
original application number \_\_\_\_\_,  
original filing date \_\_\_\_\_.

resulted from the entry into the U.S. under 35 U.S.C. 371 of international application  
\_\_\_\_\_ filed on \_\_\_\_\_.

**CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]**

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

May 2, 2006  
Date

Signature

Brian Hoffman  
Typed or printed name of person signing Certificate

Adjustment dates: 10/10/2006 CKHLOK  
05/08/2006 TBESHAI 0000016 6286045  
01 FC:1599 -2540.00 OP

10/10/2006 CKHLOK 0000005 6286045  
01 FC:1551 900.00 OP  
02 FC:1558 1640.00 OP

05/08/2006 TBESHAI 0000016 6286045  
01 FC:1599 2540.00 OP

1. SMALL ENTITY

Patentee claims, or has previously claimed, small entity status. See 37 CFR 1.27.

2. LOSS OF ENTITLEMENT TO SMALL ENTITY STATUS

Patentee is no longer entitled to small entity status. See 37 CFR 1.27(g).

3. MAINTENANCE FEE (37 CFR 1.20(e)-(g))

The appropriate maintenance fee must be submitted with this petition, unless it was paid earlier.

NOT Small Entity				Small Entity			
Amount	Fee	(Code)		Amount	Fee	(Code)	
<input checked="" type="checkbox"/> \$900.00	3½ yr fee	(1551)		<input type="checkbox"/> \$_____	3½ yr fee	(2551)	
<input type="checkbox"/> \$_____	7½ yr fee	(1552)		<input type="checkbox"/> \$_____	7½ yr fee	(2552)	
<input type="checkbox"/> \$_____	11½ yr fee	(1553)		<input type="checkbox"/> \$_____	11½ yr fee	(2553)	

MAINTENANCE FEE BEING SUBMITTED \$\_\_\_\_\_

4. SURCHARGE

The surcharge required by 37 CFR 1.20(i)(2) of \$1,640.00 (Fee Code 1558) must be paid as a condition of accepting unintentionally delayed payment of the maintenance fee.

SURCHARGE FEE BEING SUBMITTED \$1,640.00

5. MANNER OF PAYMENT

Enclosed is a check for the sum of \$2,540.00.

Please charge Deposit Account No. \_\_\_\_\_ the sum of \$\_\_\_\_\_. A duplicate copy of this authorization is attached.

Payment by credit card. Form PTO-2038 is attached.

6. AUTHORIZATION TO CHARGE ANY FEE DEFICIENCY

The Commissioner is hereby authorized to charge any maintenance fee, surcharge or petition deficiency to Deposit Account No. 19-2555. A duplicate copy of this authorization is attached.



7. OVERPAYMENT

As to any overpayment made please

Credit to Deposit Account No. 19-2555.

OR

Send refund check.


**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

8. STATEMENT

The delay in payment of the maintenance fee to this patent was unintentional.

9. PETITIONER(S) REQUEST THAT THE DELAYED PAYMENT OF THE MAINTENANCE FEE BE ACCEPTED AND THE PATENT REINSTATED.

May 2, 2006  
Date

  
Signature(s) of Petitioner(s)

Telephone  
Number: (415) 875-2484

Brian M. Hoffman, Reg. No. 39,713  
Typed or printed name(s)

Address

Fenwick & West LLP

Silicon Valley Center

801 California Street

Mountain View, CA 94041

37 CFR 1.378(d) states: "Any petition under this section must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest."

Enclosures:

Maintenance Fee payment

Surcharge

\_\_\_\_\_



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P. O. Box 1460  
Alexandria, VA 22313-1460  
www.uspto.gov

Paper No. 22

BRIAN M. HOFFMAN  
FENWICK & WEST LLP  
SILICON VALLEY CENTER  
801 CALIFORNIA STREET  
MOUNTAIN VIEW, CA 94041

COPY MAILED

OCT 1 0 2006

OFFICE OF PETITIONS

In re Patent No. 6,286,045	:	
Issue Date: September 4, 2001	:	
Application No. 08/858,650	:	ON PETITION
Filed: May 19, 1997	:	
Patentee(s) Michael John Griffiths et al	:	

This is a decision on the petition under 37 CFR 1.378(c), filed May 5, 2006, to accept the delayed payment of a maintenance fee for the above-identified patent.

The petition is **GRANTED**.

The maintenance fee is hereby accepted and the above-identified patent is reinstated as of the mail date of this decision.

It is not apparent whether the person signing the statement of unintentional delay was in a position to have firsthand or direct knowledge of the facts and circumstances of the delay at issue. Nevertheless, such statement is being treated as having been made as the result of a reasonable inquiry into the facts and circumstances of such delay. In the event that such an inquiry has been made, petitioner must make such an inquiry. If such inquiry results in the discovery that the delay in paying the maintenance fee under 37 CFR 1.378(c) was intentional, petitioner must notify the Office.

Petitioner will not receive future correspondence related to maintenance fees for the above-identified patent unless a fee address@ (see PTO/SB/47) is submitted for the above-identified patent.

Telephone inquiries concerning this decision should be directed to Irvin Dingle at (571) 272-3210.

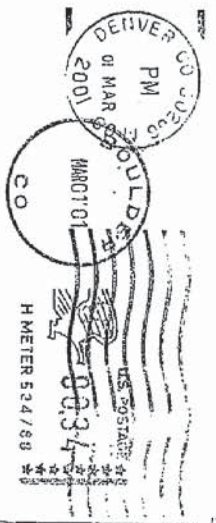
The patent file is being forwarded to Files Repository.

*Irvin Dingle*  
Irvin Dingle  
Petitions Examiner  
Office of Petitions

CHRISMAN BYNUM & JOHNSON  
ATTORNEYS AND COUNSELORS AT LAW  
190 FIFTEENTH STREET  
BOULDER, COLORADO 80502



Box Free Amendment  
Assistant Commissioner for Patents  
Washington, DC 20231







**PATENT APPLICATION FEE DETERMINATION RECORD**

Effective October 1, 1996

Application or Docket Number

08/858600

*1, 14, 27, 34, 35*

**CLAIMS AS FILED - PART I**

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	<i>42</i> minus 20 =	<i>22</i>
INDEPENDENT CLAIMS	<i>2</i> minus 3 =	<i>2</i>
MULTIPLE DEPENDENT CLAIM PRESENT		

\* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
	385.00	OR		770.00
x\$11=		OR	x\$22=	<i>484</i>
x40=		OR	x80=	<i>120</i>
+130=		OR	+260=	
TOTAL		OR	TOTAL	<i>1114</i>

**CLAIMS AS AMENDED - PART II**

AMENDMENT A	(Column 1)	(Column 2)	(Column 3)	PRESENT EXTRA
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR		
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

(Column 1) (Column 2) (Column 3)

AMENDMENT B	(Column 1)	(Column 2)	(Column 3)	PRESENT EXTRA
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR		
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

(Column 1) (Column 2) (Column 3)

AMENDMENT C	(Column 1)	(Column 2)	(Column 3)	PRESENT EXTRA
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR		
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

\*\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.  
 \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."  
 \*\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."  
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Effective October 1, 1997				Application or Docket Number										
<b>CLAIMS AS FILED - PART I</b>						<b>SMALL ENTITY TYPE</b> <input type="checkbox"/>		<b>OR</b>		<b>OTHER THAN SMALL ENTITY</b>				
		(Column 1)			(Column 2)									
FOR		NUMBER FILED		NUMBER EXTRA		RATE		FEE		RATE		FEE		
BASIC FEE								395.00				790.00		
TOTAL CLAIMS		42		minus 20 =		*		22		OR		x\$22=		
INDEPENDENT CLAIMS		5		minus 3 =		*		2		OR		x82=		
MULTIPLE DEPENDENT CLAIM PRESENT										OR		+270=		
								TOTAL		OR		TOTAL		
								719		OR		1428-		
<b>CLAIMS AS AMENDED - PART II</b>						<b>SMALL ENTITY</b>		<b>OR</b>		<b>OTHER THAN SMALL ENTITY</b>				
		(Column 1)			(Column 2)									
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE		ADDITIONAL FEE		RATE		ADDITIONAL FEE	
	Total	* 78	Minus	** 42	=	36	x\$11=		324.00		OR		x\$22=	
	Independent	* 9	Minus	*** 5	=	4	x41=		156.00		OR		x82=	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM										OR		+270=	
								TOTAL		OR		TOTAL		
								ADDIT. FEE		OR		ADDIT. FEE		
								480.00		OR				
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE		ADDITIONAL FEE		RATE		ADDITIONAL FEE	
	Total	*	Minus	**	=		x\$11=				OR		x\$22=	
	Independent	*	Minus	***	=		x41=				OR		x82=	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM										OR		+270=	
								TOTAL		OR		TOTAL		
								ADDIT. FEE		OR		ADDIT. FEE		
										OR				
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE		ADDITIONAL FEE		RATE		ADDITIONAL FEE	
	Total	*	Minus	**	=		x\$11=				OR		x\$22=	
	Independent	*	Minus	***	=		x41=				OR		x82=	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM										OR		+270=	
								TOTAL		OR		TOTAL		
								ADDIT. FEE		OR		ADDIT. FEE		
										OR				



# CHECKLIST FOR PROCESSING NEW APPLICATIONS

SERIAL NUMBER 08/858650

revised 6/29/95

## INSTRUCTIONS:

1. Make a checkmark beside each item IF verified.
2. If corrections are required, write notes to the examiner or supervisor on reverse side.

### 1. FACE OF THE FILE

1. Printed and stamped serial numbers match the bar code label.
2. Filing Date present.
3. Class/Subclass present.
4. Applicant(s) name present.
5. Total number of drawings present.
6. Total number of claims present.
7. Total number of independent claims present.
8. Filing fee received present.
9. Mailing address present.
10. Title of invention present.

### 2. CENTER OF THE FILE

#### A. DRAWINGS

1. None (go to B)
2. Serial Number present and correct on each sheet.
3. Number of sheets entered on line 1 of contents.

#### B. SMALL ENTITY STATEMENT

1. None and not recorded on face of file (go to C)
2. Statement present.
3. Small Entity recorded on face of file.

#### C. DECLARATION OR OATH

1. Title matches face of file and specification.
2. Declaration phrase present. (I hereby declare all...)
3. (Original and first inventor or inventors...) phrase present.
4. (Reviewed and understand the contents of the application, including claims...) phrase present.
5. (Acknowledge duty to disclose information in accordance with 1.56(a)...) phrase present.
6. Residence, citizenship, post office address of all applicants present.
7. Signed by all applicants.
8. Less than 3 months before filing date, or less than six months after filing date.

### D. CLAIMS (as filed)

1. Complete form 1360 and 875: (forms on right side of file)
2. Circle independent claims on the Index of Claims.
3. Draw line under the last claim number on the Index of Claims.

### E. SPECIFICATION

1. Serial Number present and correct.
2. Specification in permanent ink.
3. Brief Description of each drawing figure.
4. No missing or duplicate pages.
5. No holes punched in text.

### F. ABSTRACT

1. None (go to G)
2. Serial Number present and correct.
3. Abstract on separate page.
4. 25 lines or less.
5. One paragraph ONLY.

### G. PTO-1556

1. Present

### H. PRE-AMENDMENTS (found on right side of file)

1. None (go to I)
2. Enter on Contents of filewrapper.
3. Instruction to cancel claims.
4. Claims canceled on Index of Claims.
5. Instruction to add claims.
6. Circle new independent claims on the Index of Claims.
7. Draw line under the new last claim number on Index of Claims.
8. Complete forms 1360 and 875.

### I. PTO-948

1. Present

### 3. RIGHT SIDE OF FILE

1. PALM File Data sheet present.
2. Transmittal letters present.
3. Forms 1360 & 875 present/complete.
4. Miscellaneous Papers present/entered.
5. Petition to Make Special present. (Enter and place in the center)
6. Drawing prints present. (2 copies)

**FEES**

- 1. Correct filing fee paid.
- 2. Excess claims fees paid:
  - a. Excess total claims more than 20.
  - b. Excess independent claims more than 3.
  - c. First multiple dependent claim fee paid.
- 3. Miscellaneous paper fee paid.

**FINAL STEPS**

- 1. Sign and date center of filewrapper, under flap.
- 2. Docketed to examiner.

**NOTES TO SUPERVISOR:**

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**NOTES TO EXAMINER:**

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**SIGNATURE OF PREPARER:**

*S. Badie*

**DATE:**

*2/23/98*



**MULTIPLE DEPENDENT CLAIM  
FEE CALCULATION SHEET  
(FOR USE WITH FORM PTO-876)**

SERIAL NO. 081858650  
APPLICANT(S)

FILING DATE 5/19/97

**CLAIMS**

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT		*		*		*	
	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1						51					
2		1					52					
3							53					
4		1					54					
5							55					
6		1					56					
7							57					
8		1					58					
9		1					59					
10							60					
11		1					61					
12		1					62					
13		1					63					
14		1					64					
15		1					65					
16	1						66					
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26		1					76					
27	1						77					
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30		1					80					
31		1					81					
32		1					82					
33		1					83					
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35		1					85					
36	1						86					
37	1						87					
38		1					88					
39		1					89					
40		1					90					
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44							94					
45							95					
46							96					
47							97					
48							98					
49							99					
50							100					
TOTAL IND.	5						TOTAL IND.					
TOTAL DEP.	37						TOTAL DEP.					
TOTAL CLAIMS	42						TOTAL CLAIMS					

PTQ-1380 (3-78)

\*MAY BE USED FOR ADDITIONAL CLAIMS OR AMENDMENTS

U.S. DEPARTMENT OF COMMERCE  
Patent and Trademark Office







SEARCHED			
Class	Sub.	Date	Exmr.
709	217	12/16/99	✓
	218		
	219		
	224		
	227		
	229		
	230		
	232		
	239		
705	14		
	10		
	26		
	27		
707	10		
	501		
	503		

SEARCH NOTES		
	Date	Exmr.
not search from 08/778,635	3/2/99	os ✓
Tlee - interference? w/ 08/132, 634	12/18/99	os ✓
ACM IEEE part cache of cell case required	9/10/01	os ✓

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
709	219	3/27/01	os ✓
705	14		
707	501		



POSITION	ID NO.	DATE
CLASSIFIER		1/21/97
EXAMINER	422	10-6
TYPIST		
VERIFIER		
CORPS CORR.		
SPEC. HAND		
FILE MAINT.		
DRAFTING		

INDEX OF CLAIMS

Claim	Date
1	10/1/97
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- SYMBOLS
- ✓ ..... Rejected
  - ..... Allowed
  - (Through numeral) ..... Canoeled
  - + ..... Restricted
  - N ..... Non-elected
  - I ..... Interference
  - A ..... Appeal
  - O ..... Objected





US006286045B1

(12) **United States Patent**  
**Griffiths et al.**

(10) **Patent No.:** **US 6,286,045 B1**  
(45) **Date of Patent:** **\*Sep. 4, 2001**

(54) **INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED**

(75) Inventors: **Michael John Griffiths**, Broomfield, CO (US); **James David McElhiney**, Ottawa (CA)

(73) Assignee: **Matchlogic, Inc.**, Louisville, CO (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **08/858,650**

(22) Filed: **May 19, 1997**

(51) Int. Cl.<sup>7</sup> ..... **G06F 13/00**

(52) U.S. Cl. .... **709/224; 709/219; 705/14; 707/501**

(58) **Field of Search** ..... **709/217, 218, 709/219, 224, 221, 229, 230, 238, 239; 705/14, 10, 26, 27, 1; 707/20, 501, 503**

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(List continued on next page.)

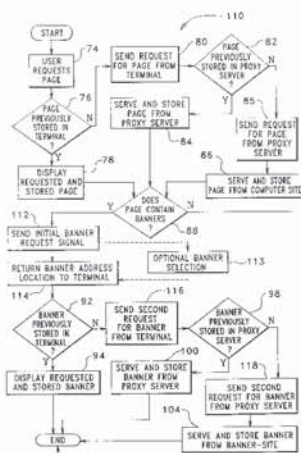
*Primary Examiner*—Dung C. Dinh

(74) *Attorney, Agent, or Firm*—James R. Young; Chrisman Bynum & Johnson

(57) **ABSTRACT**

A system for storing information on a computer network and allowing the information to be accessed by terminals connected to the computer network, either directly, or through an intermediary device such as a local or proxy server, includes computer or web sites which store pages requested by terminals for display on the terminals. The pages may include references to banners to be displayed in conjunction with the web pages on the terminal. The terminal initiates access or connection to a desired computer or web site to access a desired page. After the desired page is downloaded, transmitted, or served to the terminal from the computer or web site, the terminal initiates and sends an initial banner request signal to an information server. The information server returns a redirect signal to the terminal telling the terminal the location of the desired banner on the computer network, which may be the information server, the computer site, or some other information server, computer site, or location accessible via the computer network. The terminal then initiates a second banner request signal to the location of the desired banner and the banner is served to the terminal for display on the terminal, unless the requested banner has previously been stored or cached in the terminal’s memory or in the memory of a local or proxy server connected to the terminal, in which case the second banner request signal is not sent across the computer network and the banner is loaded directly from the terminal’s memory or served to the terminal from the proxy server.

**78 Claims, 3 Drawing Sheets**



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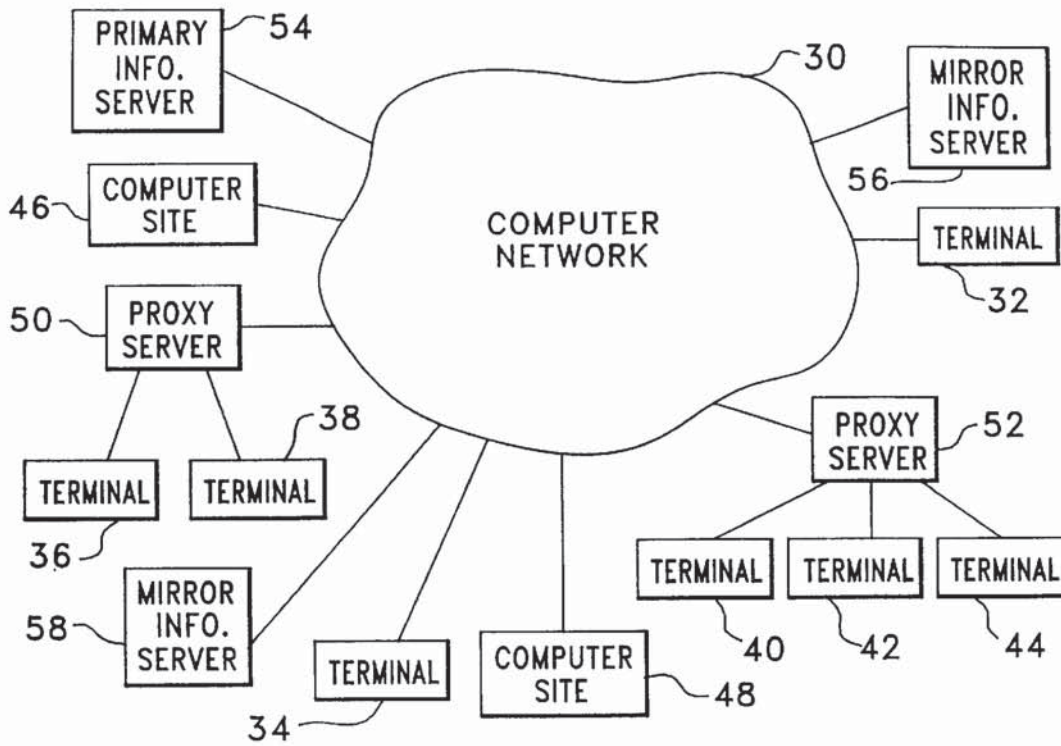


FIG. 1

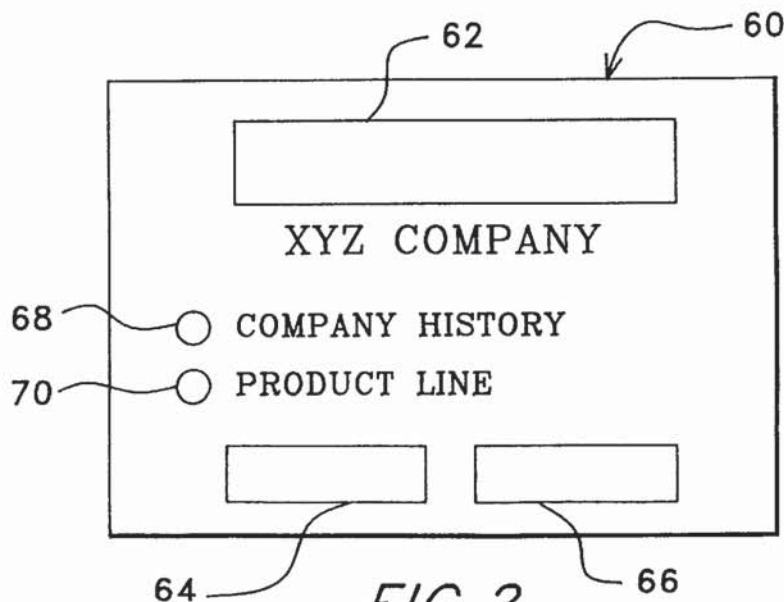


FIG. 2



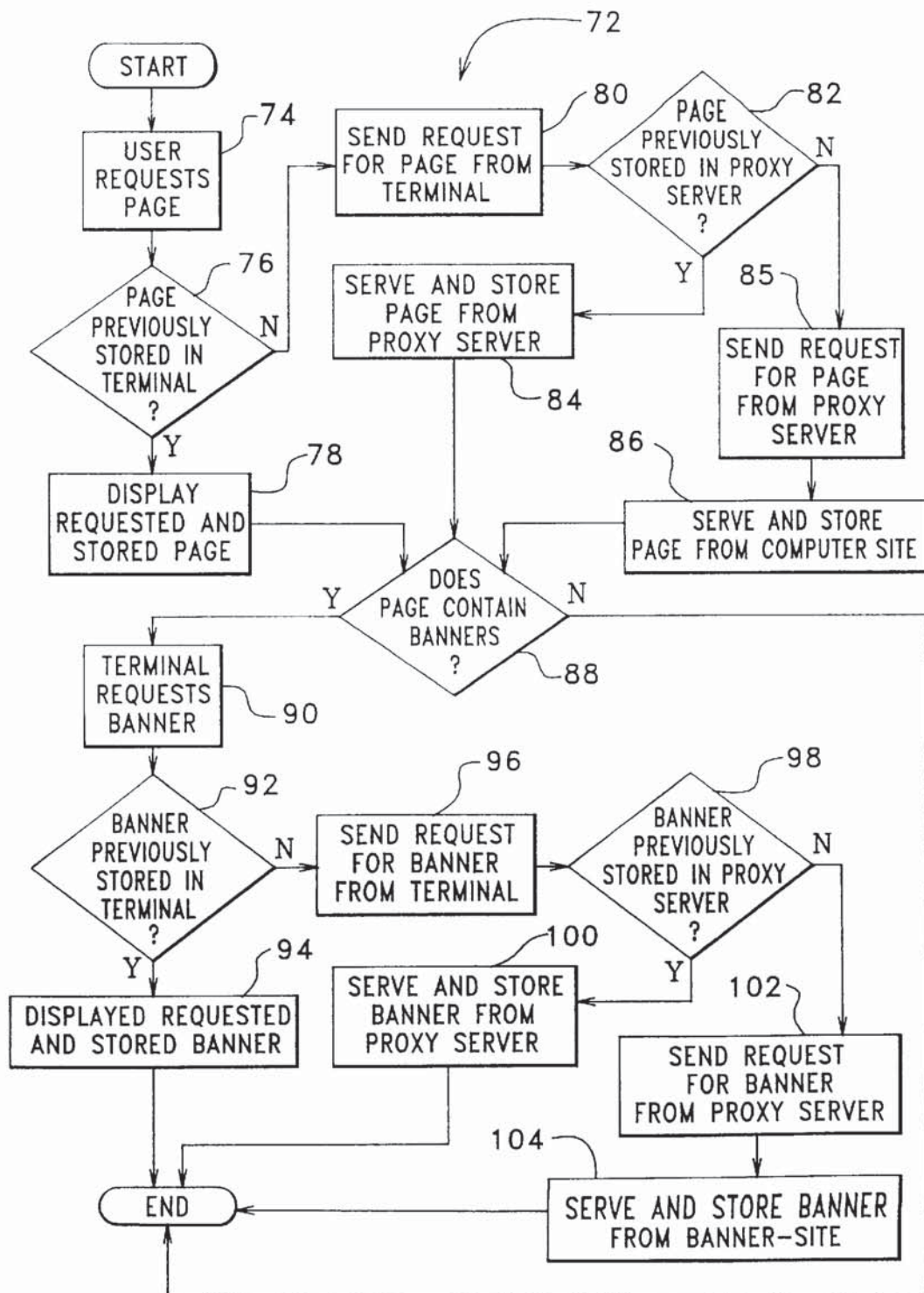


FIG. 3  
(PRIOR ART)

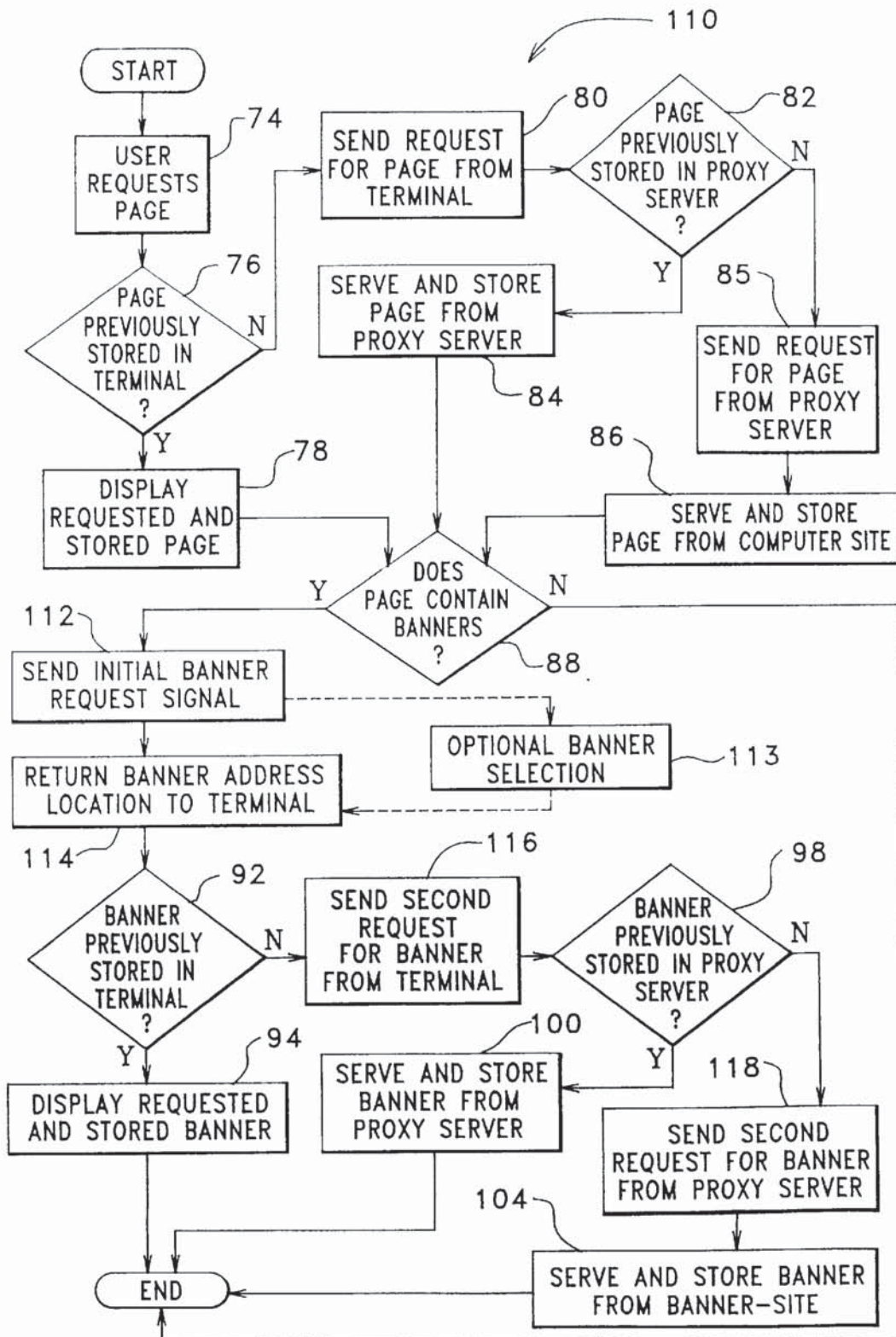


FIG. 4



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**INFORMATION STORAGE AND DELIVERY  
OVER A COMPUTER NETWORK USING  
CENTRALIZED INTELLIGENCE TO  
MONITOR AND CONTROL THE  
INFORMATION BEING DELIVERED**

**BACKGROUND OF THE INVENTION**

**1. Field of the Invention**

This invention relates to the system for the storage, management, and delivery of information on a computer network and, more specifically, to the efficient and reliable storage, delivery, and monitoring of advertising and other information on a computer network.

**2. Description of the Prior Art**

During recent years there have been rapid advancements in computers and computer networking. In particular, the world-wide network of computers commonly referred to as the Internet has seen explosive growth. The Internet comprises a vast network of smaller wide area and local area computer networks connected together so as to allow the sharing of resources and to facilitate data communication between computers and users. The rapid growth of the Internet is due, in large part, to the introduction and widespread use of graphical user interfaces called browsers which allow users easy access to network servers and computers connected to the Internet and, more particularly, the World Wide Web.

The World Wide Web forms a subset of the Internet and includes a collection of servers, computers, and other devices. Each server may contain documents formatted as web pages or hypertext documents that are accessible and viewable with a web compliant browser, such as the Netscape Navigator™ browser or the Mosaic™ browser. Each hypertext document or web page may contain references to graphic files or banners that are to be displayed in conjunction with the hypertext document or web page. The files and banners may or may not be stored at the same location as the hypertext document or web page.

A hypertext document often contains hypertext links to other hypertext documents such that the other hypertext documents can be accessed from the first hypertext document by activating the hypertext links. The servers connected to the World Wide Web utilize the Hypertext Transfer Protocol (HTTP) which is widely known protocol which allows users to use browsers to access web pages and the banners or files associated with web pages. The files, banners, hypertext documents, or web pages may contain text, graphics, images, sound, video, etc. and are generally written in a standard page or hypertext document description language known as the Hypertext Markup Language (HTML). The HTML format allows a web page developer to specify the location and presentation of the graphic, textual, sound, etc. on the screen displayed to the user accessing the web page. In addition, the HTML format allows a web page to contain links, such as the hypertext links described above, to other web pages or servers on the Internet. Simply by selecting a link, a user can be transferred to the new web page, which may be located very different geographically or topologically from the original web page.

When using a conventional browser, a user can select which web page or hypertext document the user wishes to have displayed on the user's computer or terminal by specifying the web page's Universal or Uniform Resource Locator (URL) address. Each server has a unique URL address and, in fact, so does each web page and each file needed to display the web page. For example, the URL

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address for the U.S. Patent and Trademark Office is currently <http://www.uspto.gov>. When a user types in this URL address into a browser, the user's terminal establishes a connection with the U.S. Patent and Trademark Office and the initial web page for the U.S. Patent and Trademark Office is transmitted from the server storing this web page (which may or may not be actually located at the U.S. Patent and Trademark Office) to the user's terminal and displayed on the user's terminal. The web page may include a number of graphic images or elements, often referred to as banners, which are to be displayed on the user's terminal in conjunction with the web page. Each of the graphic images is typically stored as a separate file on the server and has its own URL address. When the web page is initially transmitted from the server to the user's terminal, the browser receives the URL addresses for the graphic images and then requests that they be transmitted from the server on which they are stored to the user's terminal for display on the user's terminal in conjunction with the web page. The server(s) on which the graphic images are stored may or may not be the same server on which the original web page is stored. More specifically, since the URL's addresses for the included graphic images are all processed separately using the HML protocols, it is possible and, in fact, common, for these graphic images to be stored on separate and even widely distributed computers or hosts, all of which are accessible to the user's terminal via a computer network. For purposes of the present invention, the term "banner" is meant to be construed very broadly and includes any information displayed in conjunction with a web page wherein the information is not part of the same file as the web page. That is, a banner includes anything that is displayed or used in conjunction with a web page, but which can exist separately from the web page or which can be used in conjunction with many web pages. Banners can include graphics, textual information, video, audio, animation, and links to other computer sites, web sites, web pages, or banners.

The growth of easy access to the World Wide Web and the ability to create visually pleasing web pages have helped increase the amount of advertising and other promotional materials created for use and display with web pages. For example, a car manufacturer may have a web page describing the company and the cars and car parts that the company manufactures and sells. Part of the web page may include advertising information or banners such as, for example, images of current car models sold by the manufacturer or the types and numbers of cars the manufacturer has in stock. The car manufacturer may also contract with the owners or operators of other web pages to have the car manufacturer's advertisement banners displayed when users access these other web pages. Similarly, an advertising agency may contract with various web sites to have the advertisement banners of the agency's clients displayed when users access the web pages stored on the web sites. For example, an advertising agency or ad-network firm may contract with a web site containing general information about cars to have advertising information or banners included on the web pages displayed to a user accessing the web site. The advertising banners may contain graphics, text, etc. about car models or car parts manufactured by one of the advertising agency's clients. Furthermore, the advertisement banners may not be stored on the same server or computer or web site on which the web page is stored. Rather, all or a significant portion of the advertisement banners created by an advertising agency may reside on one or more information or ad servers. Typically, an advertising agency will pay a fixed amount of money for a fixed number of displays of



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its advertisement banners on a single web page or group of web pages. Therefore, advertising agencies are understandably very interested in knowing which advertisement banners have been displayed with which web pages and how often each advertisement banner has been displayed on terminals or otherwise served to terminals.

Unfortunately, the current state of the art is such that accurate counts are not made of how many times an banner, even a banner containing an advertisement, is displayed to users or served to terminals. Furthermore, nature and extent of the problem of miscounting displays of banners is not well-known or even understood in the industry or by people of ordinary skill in the art. Therefore, despite the well-developed state of the art in the displaying of information, banners, and advertisements in conjunction with web pages, documents, or other information, there is still a need for a system for storing and delivering information and banners on a computer network where accurate counts of the number of times each piece of information and banner is displayed can be made and the information and banners are displayed quickly and efficiently to users or terminals. In addition, there is a need for a highly reliable, even fault-tolerant, system for storing and delivering the information and banners that will not significantly reduce the efficiency of the Internet or the servers on which the information and banners are stored, while providing for accurate monitoring and counting of the information and banners displayed to a user or served to a terminal.

#### SUMMARY OF THE INVENTION

Accordingly, it is a general object of the present invention to provide a system for storing and delivering information on a computer network.

It is a specific object of the present invention to provide a system for the storage, delivery monitoring, and tailoring of advertising information on a computer network.

It is another general object of the present invention to provide a system for storing and delivering information on a computer network wherein accurate counts of the number of times the information is displayed or served to users or terminals can be made.

It is a specific object of the present invention to provide a system for storing and delivering information on a computer network wherein the operation of the computer network is not significantly affected.

It is another general object of the present invention to provide a system for storing and delivering information on a computer network wherein the system maintains a high degree of reliability and fault tolerance.

Additional objects, advantages, and novel features of the invention shall be set forth in part in the description that follows, and in part will become apparent to those skilled in the art upon examination of the following or may be learned by the practice of the invention. The objects and the advantages may be realized and attained by means of the instrumentalities and in combinations particularly pointed out in the appended claims.

To achieve the foregoing and other objects and in accordance with the purposes of the present invention, as embodied and broadly described herein, the system includes terminals connected to a computer network, either directly, or indirectly through an intermediary device such as a local or proxy server, that access computer or web sites also connected to the computer network to download or transmit pages, documents, or other information from the computer or web sites for storage or display on the terminals, wherein

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the pages, documents, or other information served to the terminals contain references to banners to be displayed in conjunction with the pages, documents, and information. The terminal initiates access or connection to a desired computer or web site to access a desired page. After the desired page is transmitted and served to the terminal from the computer or web site, the terminal initiates and sends an initial banner request signal to an information server either requesting that unspecified banner be served to the terminal or that a specified banner be served to the terminal. The information server returns a redirect signal to the terminal telling the terminal the location on the computer network of the banner requested or specified by the terminal or selected by the information server, which location may be the information server, the computer site, or some other information server, computer site, or location accessible to the terminal via the computer network. The terminal then initiates a second specific banner request signal to the location of the banner requested or specified by the terminal or selected by the information server and the banner is transmitted to the terminal for display on the terminal, unless the requested or selected banner has previously been stored or cached in the terminal's memory or in the memory of a local or proxy server connected to the terminal, in which case the second banner request signal is not sent across the computer network and the banner is loaded and/or displayed directly from the terminal's memory or served to the terminal from the proxy server.

In a second embodiment, a primary information server and at least one mirror information server are connected to the computer site, but may be separated either geographically or network topologically. The banner information stored in the primary information server is also stored in each of the mirror information servers. All of the initial banner request signals are sent to the primary information server which determines which information server is best suited for delivering the banner to the terminal sending the initial banner request signal. As in the first embodiment, the banner may be specifically requested by the terminal or may be selected by the primary information server. The primary information server then sends a signal to the terminal indicating to the terminal which information server the terminal should request the requested or selected banner from. The terminal then generates the second banner request signal to serve or transmit the banner from the information server selected by the primary information server. Should the primary information server go offline, one or more of the mirror information servers can become a new primary information server.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and form a part of the specification, illustrate the preferred embodiments of the present invention, and together with the descriptions serve to explain the principles of the invention. In the Drawings:

FIG. 1 illustrates a computer network over which the present invention can be implemented;

FIG. 2 shows an representative web page accessible from a computer site connected to the computer network of FIG. 1;

FIG. 3 shows a flowchart diagram of a prior method for storing and delivering information across the computer network of FIG. 1; and

FIG. 4 shows a flowchart diagram of the preferred method of the present invention for storing and delivering information across the computer network of FIG. 1.



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DETAILED DESCRIPTION OF THE  
PREFERRED EMBODIMENTS

A representative computer network **30** is illustrated in FIG. 1 and includes computers or terminals **32, 34, 36, 38, 40, 42, 44** with which users can access or connect to the computer network **30** and the resources connected to the computer network **30** such as the computer or web sites or servers **46, 48**. The computer network **30** can include satellite links, microwave links, fiber optic transmission lines, local area networks, wide area networks, etc. Terminals, such as the terminals **36, 38, 40, 42, 44**, may be connected to the computer network **30** via local or caching proxy servers **50, 52** or other intermediary devices (not shown). Proxy servers allow multiple terminals to access the computer network **30**, while reducing the number of physical connections to the computer network **30**, as will be discussed in more detail below. A primary information server **54** and mirror information servers **56, 58** may also be connected to the computer network **30** to facilitate the serving and displaying of information or banners to the terminals **32, 34, 36, 38, 40, 42, 44**, as will also be discussed in more detail below. The computer network **30** illustrated in FIG. 1 is only meant to be generally representative of computer networks for purposes of elaboration and explanation of the present invention and other devices, networks, etc. may be connected to the computer network **30** without departing from the scope of the present invention. The computer network **30** is also intended to be representative of, and include, the Internet, the World Wide Web, privately or publicly owned or operated networks such as, for example, Tymnet, Telenet, America On-Line, Prodigy, Compuserve, Information America, and the Microsoft Network, and other local or wide area computer networks. The computer network **30** can also include or be representative of corporate or other private intranets, which are privately owned networks using Internet protocols. It should also be noted that the distinction between information servers, web site, computer sites, and generic servers is made only for the purposes of elaboration and explanation of the present invention and that a device can function simultaneously or alternatively as a computer site, web site, information server, generic server, or other device, or combinations thereof without falling outside the scope of the present invention.

By way of general introduction, in a typical computer network, a user located at a terminal can access the resources connected to the computer network. For example, a user at the terminal **34** or terminal **36** can access the web site or computer site **46** and the information stored thereon. The computer site or server **46** may contain web pages, such as the web page **60** illustrated in FIG. 2, that the user can download for display on the terminal **34**. For purposes of this invention, the term "web page" shall be defined broadly and will include any hypertext document, information, screen displays, etc. that a user can download or otherwise retrieve from a computer or web site for display and/or storage on the user's terminal, and shall not be limited to only the information, pages, or documents retrievable by a user connected to the World Wide Web. Therefore, the term "web page" will be used generically to refer to information transmitted or served to a terminal from a computer site, web site, server, or other device, wherein the web page may contain banners or references to banners that can be served to the terminal and displayed in conjunction with the web page. The web page **60** may contain textual information, such as "XYZ COMPANY" and "Company History," and information configured in banners, such as the banners **62, 64, 66**. The banners **62, 64, 66** may contain graphics, text,

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video, etc. As will be discussed in more detail below, the banners associated with a web page may not be stored at the same place as the web page and may be downloaded or served to a user's terminal separately from the web page. A significant feature and advantage of the present invention is in the way the banner information is selected and downloaded or served to a user's terminal from computer sites or information servers connected over a same computer network, as will be discussed in more detail below. The current state of the art is such that the counts of banner displays are largely inaccurate, banners are not targetable to large segments of the population using caching proxy servers, and suffers when the performance gains provided by proxy servers are not taken into account in prior art methods of counting banner displays, as will also be discussed in more detail below.

In a conventional web page, such as the web page **60**, if a user clicks on, or otherwise activates, the button associated with the textual information, a new web page might be displayed on the user's terminal. For example, if the user clicks on the button **68** associated with the textual information "Company History," a new web page devoted to the history of the XYZ company might be served from the computer site **46** to the user's terminal **34** and displayed on the user's terminal **34**. Similarly, if the user clicks on the button **70** associated with the textual information "Product Line," a new web page devoted to the product line of the XYZ company might be served from the computer site **46** to the user's terminal **34** and displayed on the user's terminal **34**. Each web page may contain similar "links" to other web pages, hypertext documents, web sites, etc. Activating a link available on a web page or hypertext document, therefore, provides the user with an ability to navigate or move to and display or download different documents, pages, banners, sites, or other information via the computer network **30**.

When a user has a web page displayed on the user's terminal, the web page and its associated banners are often stored or cached in the terminal's memory for a period of time. In this fashion, if the user desires or requests that a web page previously displayed to the user on the terminal be reaccessed and displayed on the user's terminal, the web page and the banners associated with the requested web page can be loaded directly from the terminal's memory without reconnecting to the computer or web site on which the web page is stored and from which the web page was originally served and without reconnecting to the computer site or information server on which the banners are stored and from the banners were originally served, thereby reducing the time needed to display the web page. Similarly, if the user's terminal is connected to a local or proxy server, the web page and the banners associated with the web page may be stored in the memory of the proxy server. Should the user at a terminal request a redisplay of a web page previously displayed on the user's terminal or previously displayed on any other terminal connected to the same proxy server, the web page and the banners associated from the web page can be served from the proxy server to the terminal for display on the terminal without connecting to the computer or web site on which the web page is stored and from which the web page was originally downloaded or served and without connecting to computer site or information servers on which the banners are stored and from which the banners were originally transmitted or served. Note that, in the case that the information is retrieved from a copy of the information previously stored held within a proxy server connected to the terminal, the serving of the information to the terminal will typically be completed by sending the information from



the proxy server to the terminal, i.e., without the participation of the computer site or server. Therefore, it is difficult for the computer site or server 46 to maintain an accurate count of the terminals 36, 38, etc. on which the information is displayed if the terminals are connected to caching proxy servers, if the performance benefits offered by the caching proxy server are desired.

As previously discussed above, a significant feature and advantage of the present invention is in the way the banner information is selected and transmitted and served to the user's terminal from computer sites or information servers connected over a same computer network. More specifically, the method of the present invention allows banner information to be served over a computer network to a terminal, computer, etc. in a way which takes advantage of the performance enhancements offered by caching proxy servers and such that the operation of the computer network is not significantly affected while providing the ability to accurately track or count the number of times the banner information has been displayed on terminals connected to the computer network, as will be discussed in more detail below. It is not uncommon for banners to contain up to fifty kilobytes (KB) of information, thereby making the limiting of banner transmissions across a computer network very significant to the efficiency and operation of the computer network and to banner serving computer systems.

For purposes of elaboration and explanation of the present invention, the conventions and protocols of the World Wide Web, and browsers therefore, will be used as examples, in particular, the concept of a Uniform Resource Locator (URL), the Hypertext Transfer Protocol (HTTP), the Hypertext Markup Language (HTML), and the Transmission Control Protocol/Internet Protocol (TCP/IP). It should be noted, however, that the concepts underlying the present invention can be used for computer networks using other or different types of conventions and protocols. For more details on these protocols, the reader is directed to: Kevin Washburn and Jim Evans, *TCP/IP running a successful network*, 2nd Ed. (1996), published by Addison-Wesley, Douglas E. Comer, *Internetworking with TCP/IP*, 3rd Ed. (1995), published by Prentice Hall, John December and Mark Ginsberg, *HTML 3.2 and CGI Unleashed Professional Reference Edition* (1996), published by Sams.net Publishing, and Jerry Honeycutt et al., *Using HTML 3.2 3rd Ed* (1997), published by Que Corporation, all of these references of which are incorporated herein by reference. Other information about the HTTP, HTML, TCP/IP and other network protocols can also be found in U.S. Pat. No. 5,617,540 issued to Civanlar et al., U.S. Pat. No. 5,572,643 issued to Judson, and U.S. Pat. No. 5,442,771 issued to Filepp et al., all of which are also incorporated herein by reference. The linking of one web page or hypertext document to another is commonly done using a hypertext markup comment tag. When the user clicks on or otherwise activates the hypertext markup comment tag, a link to the new web page or hypertext document is generally initiated by the user's browser software which causes the user's terminal to request that the new web page or hypertext document be displayed on the user's terminal or computer. Similarly, if a web page served to a user's terminal contains banners, the URL addresses for the banners will be served with the web page so that the terminal can request that the banners be served to the terminal for display on the terminal along with the previously served web page.

It should also be noted that the disclosed system and method also work for all types of operating systems running on the computers, terminals, computer sites, information

servers, and other devices connected to the computer network 30. Such operating systems can include, for example, Microsoft's DOS™, WINDOWS 3.x™, WINDOWS NT™, or WINDOWS 95™ software, IBM's OS/2™ software, Apple's System 7™ software, or the AIX or UNIX operating system software platforms.

Now referring back to FIG. 1, computers or terminals can be connected to the computer network 30 in a variety of ways. For example, the terminals 32, 34 can be connected directly to the computer network 30 or may be attached via a dial-up line or network access service provider. Other terminals may be connected to the computer via network proxy or local servers, such as the proxy servers 50, 52. Proxy servers allow multiple computers, terminals, or computer networks to be connected to another computer network at a single point. In addition, since the connection from the terminals 32, 34 and the proxy server 50 to the computer network 30 is in most instances slower than the connections from the terminals 36, 38 to the proxy server 50, the proxy server 50 can provide significant speed improvements. For example, a large corporation may have all its terminals connected via a local area computer network. The local area computer network can be connected to a caching proxy server which is, in turn, connected to the computer network 30. In the computer network 30 illustrated in FIG. 1, the terminals 36, 38 access the computer network 30 through the proxy server 50. Similarly, the terminals 40, 42, 44 access the computer network 30 through the proxy server 52. Using proxy servers allows multiple computers or terminals to access a computer network while limiting the number of physical connections to the computer network. Unfortunately, the use of proxy or network servers also creates some serious problems when the counting of banner information files displayed to users on terminals is desired, as will be discussed in more detail below.

As previously discussed above, the connection of computer sites, web sites, information servers, terminals, and other devices to a computer network allows the resources and information stored in the computer sites, information servers, and other devices to be accessible to users at the different terminals connected to the computer network. The users can also communicate with each other or the computer sites by sending messages or e-mail. When a user accesses the information stored at a computer site, information, web pages, or screen displays are generally served from the computer site for display on the user's terminal or computer. The information transmitted to the user's terminal may contain a banner which is also served from the computer site, or which may be instead automatically served from other computer sites or information servers connected to the computer network. As a general example, referring once again to FIG. 1, suppose a user at the terminal 36 accesses the web site or computer site 46 via the proxy server 50 and the computer network 30 in order to obtain information about the hypothetical XYZ Company. A web page about the XYZ Company, such as the web page 60 illustrated in FIG. 2, may be served from the computer site 46 to the terminal 36 and displayed on the user's terminal 36. The web page 60 may contain places for banner information, such as the banners 62, 64, 66 illustrated in FIG. 2. When the web page 60 is received by the user's terminal 36, the banners 62, 64, 66 may be received at the same time. Alternatively, instructions may be sent to the user's terminal 36 from the computer site 46 telling the terminal 36 where to find and request the banners 62, 64, 66 on the computer network 30, which may be the computer site 46, another computer site, or an information server such as the information servers 54,



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56, 58. When such instructions are received by the user's terminal 36, the terminal 36 accesses the appropriate location of banners 62, 64, 66 via the computer network 30 and requests that the banners 62, 64, 66 be served for display on the user's terminal 36.

The process described above in relation to the example has many inherent problems, particularly when it is desired to count the number of times banner information is displayed on the user's terminal. More particularly, with reference to the previous example, the banners 62, 64, 66 displayed on the user's terminal may or may not be related to the XYZ Company. Regardless of the relationship between the banners 62, 64, 66 and the XYZ Company, the XYZ Company, an advertising agency, or some other entity may wish to know how many times the banners 62, 64, 66 have been displayed on users' terminals. As a more specific example, suppose the banners 62, 64, 66 constitute advertisements. The advertiser and the company or client for whom the advertisements are created will be very interested in knowing how many times the advertisements are displayed on users' terminals. Therefore, accurate count information for the banners 62, 64, 66 is highly desirable. Unfortunately, such accurate count information is very difficult to acquire, as will now be discussed in more detail.

Now referring to FIG. 3, a conventional method 72 used to download or serve web pages and banner information to a user's terminal is illustrated. Using the examples discussed above, a user at the terminal 36 can access the computer site 46 via the computer network 30 and request a web page to be served from the computer site 46 to the terminal 36 during the request page step 74. When the user requests a page during the request page step 74, a signal is sent from the user's terminal 36 to the computer site 46 via the proxy server 50 and the computer network 30 telling the computer site 46 which page stored on the computer site 46 the user desires to have displayed on the user's terminal 36. However, the request signal sent by the user's terminal 36 during the request page step 74 may not reach the computer site 46. If the user at the terminal 36 had previously requested the same page from the computer site 46, the page may already be stored in the user's terminal 36. Similarly, if any users at the terminals 36, 38 had requested the same page from the computer site 46, the page may be stored in the proxy server 50. After the user requests a page during the request page step 74, the terminal 36 may determine if the desired page is already stored in the terminal 36 during storage determination step 76. If the desired page is already stored in the terminal 36, the terminal 36 will display the page during display step 78 without sending the signal to the computer site 46. If the desired page is not already stored in the terminal 36, the terminal 36 will send the page request signal during send page request step 80. Since the terminal 36 is connected to the proxy server 50, the page request signal sent during step 80 must pass through the proxy server before reaching the computer network 30. As a result, the proxy server 50 may determine if the desired page is already stored in the proxy server 50 during storage determination step 82 before it sends any signal to the computer site 46 over the computer network 30. If the desired page is already stored in the proxy server 50, the proxy server 50 can stop or otherwise terminate the page request signal, thereby stopping the page request signal from being received by the computer site 46, and the proxy server will serve the desired page directly to the terminal 36 for display on the terminal 36 during serve requested page step 84. The terminal 36 may also store the desired page in its own memory during the serve requested page step 84. If the proxy server 50 does not

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have the desired page already stored in its own memory, the proxy server 50 will send the page request signal to the computer site 46 over the computer network 30 during send page request step 85. The computer site 46 will then serve the desired page to the proxy server 50 and the terminal 36 for display on the terminal 36 during the serve requested page step 86. Either or both the terminal 36 and the proxy server 50 may store the desired page during the serve requested page step 86.

Since terminals may be connected to the computer network 30 without also being connected to proxy servers, the steps 82, 84, and 85 may not always be necessary in the method 72. For example, now referring to FIG. 1, the terminal 34 is not connected to a proxy server but is connected to the computer network 30. Therefore, the steps 82, 84 in the method 72 are not needed and the terminal 34 will send the page request signal via the computer network 30 directly to the computer site 46 during the send page request signal step 80.

The web page requested by the user from the computer site 46 may contain banner information, such as the banners 62, 64, 66 in the web page 60 illustrated in FIG. 2. The banner information may be served with the web page or, more commonly, the banner information may reside in separate files which will need to be requested by the user's terminal 36 before the banner information can be displayed on the user's terminal 36 along with the requested web page. Typically, the web page information served to the terminal 36 for display on the terminal 36 will contain the electronic address information containing the location of the banner information on the computer network 30. The banner information may be located on the computer site 46 or at other locations connected to the computer network 30, as will be discussed in more detail below.

The terminal 36 will determine during banner determination step 88 if the page served to the terminal during steps 78, 84, or 86 contains banner information not already included in the web page displayed on the terminal 36. If the answer is no, i.e., the web page served to the terminal 36 is complete, the process is ended. If the answer is yes, i.e., the page served to the terminal 36 is not complete and contains banner information that needs to be served to the terminal 36, the terminal 36 requests the banner during request banner step 90.

Similar to the process described above for service of the desired page to the terminal 36, the terminal 36 first determines if the requested banner is already stored in the memory of the terminal 36 during banner storage determination step 92. The banner storage determination step 92 can occur in conjunction with the banner request step 90 such that no signal is generated by the terminal 36 if the requested banner is already stored in the terminal 36. If the requested banner is, in fact, already stored in the memory of the terminal 36, the terminal 36 will display the requested banner during display banner step 94 and the process is over. If the requested banner is not already stored in the memory of the terminal 36, the terminal 36 will generate and send a banner request signal during send banner request signal step 96. The request banner signal sent during the step 96 contains the address of the location of the desired banner so the computer network 30 can properly locate the desired banner.

Since the terminal 36 is connected to the proxy server 50, in a similar manner as described above in relation to steps 82, 84, 85, 86, once the proxy server 50 receives the banner request signal from the terminal 36, the proxy server 50 will determine whether or not the desired banner is already



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stored in the memory of the proxy server 50 during banner storage determination step 98. If the desired banner is already stored in the memory of the proxy server 50, the proxy server 50 will transmit and serve the banner directly to the terminal 36 for display by the terminal 36 during serve banner step 100. The terminal 36 may also store the banner in its own memory during the serve banner step 100. If the requested banner is not already stored in the proxy server 50, the proxy server will send the banner request signal to the device on which the requested banner is stored via the computer network 30 during the send banner request signal step 102. The device on which the requested banner is stored will then download or serve the requested banner to the proxy server 50 and the terminal 36 during the serve banner step 104 for display by the terminal 36. Either or both the terminal 36 and the proxy server 50 may store the banner served by the device on which the requested banner is stored during the serve banner step 104.

The steps 98, 100, and 102 will not be necessary if a terminal requesting the banner information is not connected to a proxy server. For example discussed above, since the terminal 34 is not connected to a proxy server, the steps 98, 100, and 102 are not needed for the terminal 34 and the terminal 34 will send the page request signal via the computer network 30 directly to the server on which the requested banner is stored during send banner request signal step 102.

When the computer site 46 in the example described above in relation to FIG. 3 is a web site using the HTTP and HTML protocols, the user selects and accesses the web site 46 by entering the Uniform Resource Locator (URL) address of the web site 46 into the terminal 36. The page request signal generated by the terminal 36 during step 74 tells the computer network 30 and the equipment associated with the computer network 30 which computer site the user wishes to access. Each computer and device attached to the computer network 30 will have its own unique URL address and each page and file stored in each computer will usually also have its own URL address so that each page and file can be made accessible to users via the computer network 30. For example, if the user desires to access the web page 60 for the XYZ company, the user may enter the URL address for the web page 60, <http://www.xyzcompany.com>, into the browser software operating on the user's terminal. The URL address contains an alphanumeric portion or domain name, "www.xyzcompany.com" that identifies the web site in an easy to understand and remember format. Each computer or web site and other host devices, end systems, networks, or network router devices connected to the computer network 30, however, has a unique Internet Protocol (IP) address that is thirty-two bits in length and is generally written as four decimal numbers in the range zero (0) through 255, separated by periods. For example, an IP address could be 128.10.2.30 which in its full thirty-two bit format is 10000000.00001010.00000010.00011110. Providing every host computer on a computer network with a unique IP address allows any host computer to communicate with any other host computer.

By a process known as domain name resolution or by the use of Domain Name System (DNS), the IP address of the computer or web site on which XYZ Company's web page 60 and the web page 60 are stored can be determined from the domain name provided in the URL address. In fact, the IP address for computer or web site must first be determined when an URL address is entered by the user at a terminal that does not contain the IP address. For example, if a user at a terminal or computer enters the alphanumeric domain name

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address, i.e., <http://www.xyzcompany.com>, the alphanumeric domain name must be resolved by the Domain Name System to a specific IP address, i.e., <http://1019.247.56.38>, before the designated and desired computer containing the web page 60 for the XYZ Company can be accessed. If the user enters the specific IP address directly, then use and access of the Domain Name System is not required. If resolution or determination of an IP address is required, the name server will return the appropriate IP address to the terminal which generated the signal in which the IP address was not included. The use and operation of domain name resolution and the Domain Name System for determining IP addresses are well known to people of ordinary skill in this art and need not be explained in any further detail for purposes of the present invention.

When the web page requested by the user during page request step 74 is served to the terminal 36 during steps 78, 84, or 86, the web page will often contain the URL addresses of banners or banner information to be displayed along with the web page on the user's terminal 36 instead of the banner information itself. The terminal 36 will then use the URL addresses of the desired banner information to access the computer network 30 and request that the desired banner information be served to the terminal 36 for display on the terminal 36. For example, when the web page 60 for the XYZ company is served to a terminal, the web page may contain URL addresses for the banners 62, 64, 66. The URL address for the banner 62 may be of the form <http://www.bannersite1.com/banner1.gif>. The "banner site1.com" portion of the URL address for the banner 62 indicates which device, for example the information server 54, connected to the computer network contains the requested banner 62 where the "banner1.gif" portion of the URL address for the banner 62 indicates which file stored on the indicated device constitutes the banner 62. Similarly, the URL address for the banner 64 may be of the form <http://www.bannersite2.com/banner54.gif>. The "banner site2.com" portion of the URL address for the banner 64 indicates which device, for example the information server 56, connected to the computer network contains the requested banner 64 where the "banner54.gif" portion of the URL address for the banner 64 indicates which file stored on the indicated device constitutes the banner 64. As shown by these examples, the banner 62 may not be stored on the same device as the banner 64. In addition, as previously discussed above, the banners 62, 64 may be located on the same web site as the requested page or may be located on other web or computer sites, such as the computer or web site 48 shown in FIG. 1, or on information servers, such as the information servers 54, 56, 58 shown in FIG. 1. When the terminal 36 requests the banner information during step 96, the banner request signal will contain the URL addresses for each banner to be displayed with the web page so that the banners can be located at, and served from, the appropriate devices on the computer network 30.

The prior art method 72 discussed above and illustrated in FIG. 3 has many inherent problems, however, which make it unsuitable for counting the number of times a banner is displayed on the terminals connected to the computer network 30, as will now be discussed in more detail. Since the web page, and the banners to be displayed with the web page, selected by the user can be stored in either the user's terminal or the proxy server connected to the user's terminal, not all requests for the banner information are forwarded by the user's terminal or respective proxy server and transmitted over the computer network 30. While this result may appear to be beneficial in that the amount of data traffic on



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the computer network **30** is reduced, in fact, this result prevents the accurate count of banner displays. More specifically, entities such as advertising agencies, advertising repping firms, and the entities hiring them want to count and know each time a banner is displayed on a user's terminal so that the success or failure of various advertising banners can be determined and so that the correct payment for the display of the advertising banners can be computed. There are two conventional ways in which the number of times a banner is displayed is counted. The first way is to count the number of times an information server or computer site serves a page during the step **86**. The second way is to count the number of times that the information server actually serves a banner during the step **104**. Unfortunately, a page requested by a terminal during the step **74** is already stored on either the terminal or a proxy server connected to the terminal, the display of the banner on the user's terminal is not counted under the first method. Similarly, if a banner requested by a terminal during the step **90** is already stored on either the terminal or a proxy server connected to the terminal, the display of the banner on the user's terminal is not counted under the second method. The discrepancy between the number of times a banner is actually displayed on a user's terminal and the number of times the display of the banner on the user's terminal is counted can become significant, even reaching error rates of eighty percent or higher.

One solution to the problem is to prevent banner information from being stored or cached on either the user's terminal or the proxy server to which the user's terminal is attached. Therefore, each time a banner is requested by the user's terminal, the banner will have to be downloaded or served from the computer site or information server on which the banner is stored to the user's terminal for display on the user's terminal. For example, the HTTP and HTML protocols allow banners to be tagged or indicated as being uncacheable or unstorable at the user's terminal or the proxy server connected to the user's terminal, as will be discussed in more detail below. Therefore, such a solution can be implemented where after each request for banner information, the requested banner information is served from the location storing the banner information, thereby allowing the display of the banner information to be counted accurately at the location at which the requested banner information is stored.

The solution described in the preceding paragraph creates a significant problem, however, that creates even more significant consequences, thereby making its use for accurately counting advertisement and banner displays highly impractical and undesirable. More specifically, the storage of web pages and banner information at the user's terminal or in the proxy server connected to the user's terminal provides several important benefits that will be eliminated by this simple solution. First, the speed at which the information is displayed on the user's terminal will be reduced since the information will always have to be transmitted or served to the user's terminal for display on the user's terminal each time the user requests the information. If the information had previously been requested by the user such that the information was already stored in the user's terminal or the proxy server connected to the user's terminal, or if the information had previously been requested by a second user at a terminal connected to the same proxy server as the first user's terminal such that information was already stored in the proxy server connected to the first user's terminal, re-requesting the information to be downloaded or served from another device connected to the computer network and

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the actual serving of the information to the user's terminal will take substantially longer than loading the information already stored in the user's terminal or serving the information to the user's terminal only from the proxy server to which the user's terminal is connected. If the banners contain advertisements, the length of time the banner is displayed to the user may also be critically important to the advertiser. The user may not wait for the banner information to be served and displayed before the user selects another web page, thereby minimizing the success of the banner.

A second and more serious problem created by having to serve the information displayed on the user's terminal each time the information is requested is that the amount of data traffic on the computer network will significantly increase, and can even bring the flow of information to a virtual stop, particularly if all requests for banner information from any terminal connected to the computer network require the information to be transmitted across the computer network to the terminal.

A third problem created with the prior art method **72** is that the step **100** eliminates any possibility of targeting specific information to be displayed with specific web pages. That is, if any demographic or other information about the user or terminal **36** is known by the server on which the banners are stored, the prior art method **72** prevents the server from using the demographic or other information to target the user with a specific banner or to tailor a banner to the specific user. Such targeting or tailoring of banners can be very important when the banners contain advertising information and the advertisers want to send specific advertisement banners to users about whom specific demographic or other information is known.

The method **110** of the present invention solves the initial problem of how to create accurate counts of banner information displays on user terminals while avoiding the problems created by requiring the banner information to be retransmitted across the computer network each time the banner information is requested by a user or a user's terminal, as will now be discussed in more detail in reference to FIG. **4**. In addition, the method **110** allows for the use of content general and content specific signals, which allow banner displays to be targeted to specific users while taking advantage of the performance gains possible with caching proxy servers, as will also now be discussed in more detail in reference to FIG. **4**.

In the method **110**, the steps **74**, **80**, **82**, **84**, **85**, **86**, and **88** are essentially the same as described above in relation to the prior art method **72** illustrated in FIG. **3**. Therefore, no further discussion of these steps is required for purpose of explanation of the method **110** of the present invention. After a requested page containing a banner has been displayed on a user's terminal during the steps **78**, **84**, or **86**, and, as determined during banner determination step **88**, if the page contains banners to be displayed on the user's terminal **36** along with the page, an initial request banner signal is generated by the user's terminal **36** during initial banner request step **112**. Unlike the previous situation with the method **72**, however, the terminal **36** and the proxy server **50** preferably do not check to see if the banner information has already been stored and the terminal **36** and the proxy server **50** preferably cannot stop the initial banner request signal sent by the terminal **36** during the step **112** from being transmitted across the computer network **30**. That is, the initial banner request signal sent by the terminal **36** during the step **112** is preferably a mandatory signal to be transmitted across the computer network **30** and that cannot be blocked or terminated by either the terminal **36** or the proxy



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server 50, even if the banner to be served to the terminal 36 is already stored in either the terminal 36 or the proxy server 50.

The initial banner request signal generated by the terminal 36 during the step 112 preferably does not contain the location information of the desired banner as does the banner request signal generated by the terminal 36 during the request banner step 90 of the prior art method 72. In other words, the initial banner request signal generated by terminal 36 during the step 112 can be a content general signal and may contain only the minimum amount of information needed to tell a designated computer site, information server, or other device which receives the initial banner request signal and on which a banner may or may not be stored or located, only that the terminal 36 desires that an unspecified banner be served to the terminal. The designated computer site, information server, or other device can then select which banner is to be served to the terminal 36. The process of selecting which banner is to be served to the terminal 36 can be made during the optional banner selection step 113, which would occur after the step 112 and before the step 114 in the method 110 illustrated in FIG. 4. If the optional selection step 113 is not used with the method 110, the terminal 36 will request during the step 112 that a specific banner be served to the terminal 36. If the optional selection step 113 is used with the method 110, the terminal 36 will only request during step 112 that a banner be served to the terminal 36, but the terminal 36 will not specify which banner is to be served to the terminal 36.

Since the designated computer site, information server, or other device should, barring any problems with the computer network 30, always receive the initial request banner signal from the terminal 36 sent during the step 112, the display of the banner on the user's terminal 36 can always be counted and monitored. Instead of returning or serving a banner to the terminal 36, however, the designated computer site, information server, or other device will usually return or send a banner location signal to the terminal 36 during return banner location address step 114 specifying the location address of the banner requested by the terminal 36 (if the optional step 113 is not used) or the banner selected by the designated computer site, information server, or other device (if the optional step 113 is used), to be served to the terminal 36. The signals transmitted during the steps 112 and 114 are very short or small since the signals contain only a small amount of information, particularly when compared to a banner which may contain a large amount of information.

Similar to the process described above for service of the desired page to the terminal 36 during step 76, the terminal 36 first determines if the requested (if the optional step 113 is not used) or the selected (if the optional step 113 is used) banner is already stored in the memory of the terminal 36 during banner storage determination step 92. If the requested or selected banner is, in fact, already stored in the memory of the terminal 36, the terminal 36 will display the banner during display banner step 94 and the process is over. If the requested or selected banner is not already stored in the memory of the terminal 36, the terminal 36 will generate and send a second banner request signal during send second banner request signal step 116. The second banner request signal sent during the step 116 is essentially the same as the signal sent during the step 96 of the method 72 and, therefore, contains the address of the location of the requested or selected banner so the computer network 30 can properly locate the requested or selected banner.

Since the terminal 36 is connected to the proxy server 50, in a similar manner as described above in relation to steps

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82, 84, 86, once the proxy server 50 receives the second banner request signal from the terminal 36, the proxy server 50 will determine whether or not the selected banner is already stored in the memory of the proxy server 50 during banner storage determination step 98. If the selected banner is already stored in the memory of the proxy server 50, the proxy server 50 will transmit the banner directly to the terminal 36 for display by the terminal 36 during serve banner step 100. The terminal 36 may also store the banner in its own memory during the serve banner step 100. If the requested or selected banner is not already stored in the proxy server 50, the proxy server will send the second banner request signal to the location of the banner on the computer network 30 during the send second banner request signal step 118 in a similar manner to the send banner request signal step 102 in the method 72. The device on which the requested or selected banner is stored will then download and serve the banner to the proxy server 50 and the terminal 36 during the serve banner step 104 for display by the terminal 36. Either or both the terminal 36 and the proxy server 50 may store the banner served by the computer site 50 during the serve banner step 104.

When the computer site 46 in the example described above in relation to FIG. 4 is a web site using the HTTP and the HTML protocols, as previously described above, the user selects and accesses the web site 46 by entering the Uniform Resource Locator (URL) address of the desired web site 46 into the terminal 36. The page request signal generated by the terminal 36 during page request step 74 tells the computer network 30 which computer or web site the user wishes to access. As previously discussed above, when the requested page is served to the terminal 36 from the web site 46, it may contain the URL addresses of specific banners to be displayed along with the requested web page, or it may contain the URL addresses in a content general format, i.e., the URL address does not specify exactly which banner is to be served to the terminal 36, only that a banner is to be served to the terminal 36. It should be noted that steps 80, 85, 112, 116, and 118 may also include name resolution of the IP address needed to transmit the signals across the computer network to the designated and desired computer web site or information server and these steps should be construed to include such IP address resolution and the use of the Domain Name System (DNS).

Again using the example of the XYZ Company and the web page 60, the web page 60 served to the terminal 36 or loaded by the terminal 36 during steps 78, 84, or 86 may include general content URL addresses for banners or specific content URL addresses for the specific banners 62, 64, 66. A general content URL address for a banner does not provide the necessary information to determine which banner is to be displayed. Rather a general content URL address for a banner only indicates that a banner is to be displayed and the receiver of the signal generated by the terminal 36 during the step 112 can decide which banner is to be displayed during the selection step 113. A general content URL address for a banner could be of the form `http://www.bannersite1.com/image;spacedesc=contentsitename`. A server at `www.bannersite1.com` looks to see if the first word after the name of the site is "image" or any other previously designated word which can be distinguished from an existing file name. If the first word after the name of the site is "image," then the URL address is recognized as a generic request or content general request for a banner, which, as a result, does not specify any particular banner. The server then looks for a space descriptor immediately following the text "spacedesc=" which provides a reference



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to a section of the server in which banners are stored or located and from where a specific banner can be selected to be served to the terminal 36. The space descriptor field in the general content URL address can reference different groups of banners such as, for example, a collection of car advertisements, a collection of detergent advertisements, etc., depending on the web page providing the general content URL address.

A specific content URL address for a banner does contain the necessary information to determine which banner is to be displayed and the location for the banner. As illustrated in the examples above, the specific content URL address for the banner 62 may be of the form `http://www.bannersite1.com/banner1.gif`. The "bannersite1.com" portion of the specific content URL address for the banner 62 indicates which device, for example the information server 54, connected to the computer network contains the banner 62 and the "banner1.gif" portion of the specific content URL address for the banner 62 indicates which file stored on the indicated device constitutes the banner 62 and the physical location of the file.

Preferably, the initial banner request signal generated by the terminal 36 during the step 112 is a general content URL address that merely requests a banner to be displayed on the terminal 36, but does not specify which banner is to be displayed. The recipient of the initial banner request signal can then select which banner is to be displayed on the terminal 36 during the selection step 113, thereby allowing targeting and variation in the banners displayed, and return a specific content URL address to the terminal 36 during the step 114 in the form of a Status HTTP 302 Redirect (temporary) signal to the terminal 36 to tell the terminal 36 where the selected banner to be displayed on the user's terminal 36 is located on the computer network 30, i.e., to provide the terminal 36 with the content specific URL address of the selected banner to be displayed on the user's terminal 36. An HTTP 302 temporary redirect signal does not create an association between the general content URL address signal generated by the terminal 36 during the step 112 and the banner to be displayed on the terminal 36 or the response signal sent to the terminal 36 during the step 114. Therefore, even though the banner displayed on the user's terminal 36 may be cached or stored on the user's terminal 36 or on the proxy server 50, the response sent during the step 114 to the general content URL address signal generated by the terminal 36 during the step 112 is not cached. Therefore, the signal sent by the terminal 36 during the step 112 will not be blocked or otherwise prevented from being transmitted over the computer network 30 by either the terminal 36 or the proxy server 50.

An alternative to using only the HTTP 302 Redirect signal is to use, in addition, standard HTML response header tags. More specifically, every time a server responds to a request for a document or page from a client's browser software, the response from the server can contain one or more response header lines. Each line of the response header describes a different aspect of the response, including its size, the type of content it is (image, text, etc.), a status code, and one or more tags which affect the changing nature of the document and how proxy servers or terminals should deal with the document.

The method 110 of the present invention can use HTML tags to tell proxy servers and terminals that the response sent during the step 114 is not cachable, even if the actual banner eventually served to the terminal is itself cachable. There are many types of tags that can be used for this purpose. For example, the Expiry tag which specifies the date and time

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beyond which a cached copy of the response is no longer valid. By setting the Expiry tag to a date in the past, the response sent to the terminal 36 during the step 114 will not be considered valid for any further signals sent by the terminal during later steps 112. Therefore, the response sent to the terminal 365 during a previous step 114 is no longer valid and the signal sent by the terminal 36 during the current step 112 cannot be blocked by the terminal 36 or the proxy server 50. Another tag that could be used is the Last-Modified Tag which specifies the last time the response was modified. By setting the Last-Modified Tag for a response as a date far in the past, the terminal or proxy server may consider the response to be too "stale" to be considered valid. A third tag that could be used is the Cache-Control Tags or the obsolete pragma:no-cache tag which informs a receiver of the response that the response is not be cached or stored in the receiver.

Another option for implementing the method 110 of the present invention using standard HTML and HTTP protocols is to incorporate variable components into the links on a web page or hypertext document such that the variable components are incorporated into the general content URL addresses sent by the terminal during the step 112. For example, referring to the web page 60 in FIG. 2, the hypertext links or URL addresses returned for the banners 62, 64, 66 when the web page 60 is displayed on the user's terminal 36 during steps 78, 84, or 86 can contain a variable component such as, for example, a random number, a time/date stamp, cgi-bin string, or a random page identifier. In this manner, each time the web page 60 is displayed on the terminal 36, the URL addresses for the needed banners 62, 64, 66 will be different. When the terminal 36 sends the initial banner request signal during step 112, the initial banner request signal can incorporate the variable component URL addresses generated when the web page 60 is served or displayed on the terminal 36. Since the variable component URL addresses are, by definition, different every time, the initial banner request signal generated during the step 112 will be different every time, thereby preventing the terminal 36 or the proxy server 50 from blocking the transmission to the computer network 30 of the initial banner request signal generated during the step 112.

Another alternative for implementing the method 110 of the present invention is to use for the general content URL address, an URL address which, though constant, is interpreted by caching proxy servers and/or caching web browsers or terminals to resemble a constantly changing URL address and, as a result, is not cached. More specifically, caching proxy servers exist which will specifically avoid caching content related to any URL address containing the strings "cgi-bin" and "?" which are strings conventionally used in the construction of URL addresses for which responses are dynamically generated and, therefore, are unsuitable for caching. It should be noted that a general content URL address using this techniques such as, for example, `http://www.bannersite1.com/cgi-bin/image;spacedisc=contensitename?variable`, need not use the cgi-bin directory and need not use the variable after the "?". Since these markers exist in the URL address, some caching proxy servers will be led to conclude that the URL address should not be cached.

In order to speed up the process of downloading, transmitting, or serving a specific banner from an information server to the terminal 56, the content specific URL address of the requested or selected banner sent to the terminal during step 114 can contain the exact Internet Protocol (IP) address of the requested or selected banner. For



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example, instead of providing the specific content URL address for the banner 62 as <http://www.bannersite1.com/banner1.gif>, the specific content URL address for the banner 62 could be provided as, for example, <http://236.45.78.190/banner1.gif>, thereby removing any need to use the Domain Name System (DNS) to convert the alphanumeric address “www.bannersite1.com” of the information server to its exact IP address. The use of content general and content specific URL addresses and IP addressing is well known to people of ordinary skill in the art and need not be explained in any further detail for purposes of the present invention.

The method 110 of the present invention has particular application to the advertising industry, as will now be discussed in more detail. While the previous discussions in regard to the prior art method 72 and the method 110 of the present invention have indicated that the banner information can be located on either the computer or web sites connected to a computer network or information servers connected to the computer network, the conventional practice in the advertising business is to have all of the banners located on one or more information or ad servers, such as the information servers 54, 56, 58. As previously discussed above, advertising agencies create the banners and then arrange or contract to have the banners be associated with web pages or web sites such that when users access the web sites and the web pages are displayed on the user’s terminal, the banners are also displayed on the user’s terminal. While the advertisements can be stored on the computer or web sites connected to the computer network, it is typically more convenient for the advertisements to be centrally stored on an information or ad server, particularly if the advertisements change or the advertisers want to target specific advertising banners to specific users. Therefore, when a web page requested by the user is served to the user’s terminal and the web page contains advertising banners, the web page will often include the address information for the advertising banner to be displayed in conjunction with the requested web page so that the terminal can request the serving of the advertising banners. By keeping the advertising banners centrally located in an information server, the advertiser can keep each advertising banner’s address information included in the web page constant while changing the actual advertising banner associated with the banner address information. In addition, the generation of content general URL addresses during the step 112, the selection of banners to be displayed by a central or primary information server during optional step 113, and the return of content specific URL addresses during the step 114 allow the advertiser to rotate and change the advertising banners displayed to users. Furthermore, if the device receiving the initial banner request signal generated by a user’s terminal during step 112 has any demographic or other information about the user, the use of content general URL addresses and content specific URL addresses in the method 110 allows the device sending the banner location signal during step 114 to select an advertising banner targeted to the particular user during the step 113, thereby increasing the appeal and success of the advertising banner. In contrast, the prior art method 72 previously discussed above does not utilize content specific and content general URL addressing. Nor does the prior art method allow for the selection or targeting of banners to be made by an information server.

The prior art method 72 also does not allow each display of the banners associated with a page to be counted, while the method 110 of the present invention specifically allows for each such display of a banner to be counted and monitored. More specifically, allowing the user’s terminal or

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proxy server connected to the user’s terminal to terminate or block a banner request from the user’s terminal (created during step 90) when the banner is already stored in either the user’s terminal or the proxy server connected to the user’s terminal in the prior art method 72 prevents accurate banner display counts to be made. In contrast, the method 110 of the present invention specifically allows each banner display to be counted by preventing the user’s terminal or the proxy server connected to the user’s terminal from terminating or blocking the initial banner request signal (created during step 112) from reaching the information or ad server in which the desired banner is stored or which is controlling the selection of the banner to be served to the terminal.

In addition to the advantage of the method 110 described above, a significant feature of the method 110 of the present invention is that it does not significantly impact the operation or efficiency of the computer network 30. While the initial banner request signal created by the terminal during the step 112 and the banner location signal generated during the step 114 are additional signals created in the method 110 that are not created in the prior art method 72, thereby creating additional data traffic and overhead on the computer network 30, the initial banner request signal and the banner location signal are both extremely small, often comprising no more than a single packet or one-hundred to two-hundred bytes. Therefore, the overhead created by the additional banner signal during the step 112 and the banner location signal during step 114 is negligible. More importantly, since the method 110 still allows the web pages and the banner information to be cached or stored in the terminals and proxy servers, there is no unnecessary retransmission of the web pages or banners from the computer or web sites or the information or ad servers to the terminals which would significantly increase the data traffic and overhead on the computer network 30.

In a second embodiment of the method 110 of the present invention, multiple information servers storing the banner information used in conjunction with the displays of web pages on user terminals are connected to the computer network. Using mirror information servers allows for banners to be distributed faster to user terminals and increases the reliability of the method 110. For example, the computer network 30 illustrated in FIG. 1 includes a primary information server 54 and mirror information servers 56, 58 which preferably contain a duplicate of the banners stored on the primary information server 54. When the terminal 36 creates and sends the initial banner request signal during the step 112, the initial banner request signal is preferably configured so that it sent to and received by the primary ad or information server 54 which in turn creates and sends the address location information of a selected banner to the terminal 36 during the step 114. The selected banner is preferably stored at the primary information server 54 and at also the mirror servers 56, 58. The address location information for the banner sent by the primary information server 54 to the terminal during the step 114 is preferably includes the address location for the banner at the information server best suited to handle a transmittal of the banner to the terminal 36 or includes other information with which the terminal 36 can determine the best suited information server to serve the banner. Typically, the information server best suited to handle the serving or transmittal of a banner to the terminal 36 will be the information server that can download or serve the banner to the terminal 36 in the shortest period of time. Other selection criteria can be used, however, in determining which information server is best suited to



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download or serve a banner to a terminal, including the network topological distance between the terminal 36 and the information servers, the geographical distance between the terminal 36 and the information servers, the bandwidth of the information servers, or the round trip times for a message between the terminal 36 and the information servers. The use of a primary information server and mirror information servers allows all of the intelligence, databases, banner display counting processes, etc. for operating the method 110 of the present invention to be stored and operated in a single location, i.e., the primary information server, while allowing mirror information servers to be little more than network accessible memory devices or servers on which the banners are stored. Many Internet Service Providers (ISPs) and other network service providers connected to computer networks will provide memory space and will store documents and other files for access and retrieval from the computer network for relatively low cost and such storage capabilities are easy to implement and maintain.

As a further example, suppose that the user at the terminal 36 sends an initial banner request signal to the primary information server 54 during the step 112 and the primary information server selects a banner to be served to the during step 113. If desired, the primary information server 54 can update the count information for the particular banner selected to be displayed on the user's terminal 36. The primary information server 54 may determine that the mirror information server 56 is best suited for serving the selected banner to the terminal 36 since the mirror information server 56 can serve the selected banner to the terminal 36 in the shortest period of time. Alternatively, the primary information server 54 may determine that either it, the mirror information server 58, or some other information server (not shown) connected to the computer network 30 can serve the selected banner to the terminal 36 in the shortest period of time. The information servers 54, 56, 58 may themselves be separated geographically or topologically such that every terminal connected to the computer network 30 has an optimal information server from which banners can be served, even if the terminals are scattered across a wide geographical or topological area. Therefore, for example, the terminal 36 may be optimally served by the mirror information server 56 while the terminal 32 may be optimally served by the primary information server 54 and the terminal 44 is optimally served by the mirror information server 58. When the primary information server 54 has determined which information server is best suited to handle the serving of the selected banner to the terminal 36, the primary information server 54 will return the banner location address for the selected banner at the selected information server to the terminal 36 during the return banner location address step 114. The terminal 36 can then request that the selected banner be served from the selected information server during the steps 98, 100, 104, 116, and 118 for display at the terminal 36.

As previously discussed above, the selection of which mirror information server is the best suited for serving a particular banner to a particular terminal can be made a variety of ways. The criteria to be considered can include precision, i.e., the accuracy of the determination of which information server is best suited to serve a particular banner to a particular terminal, the ease of implementation, and the time required for the primary information server to make the determination of which information server is best suited to serve a particular banner to a particular terminal. The decision can be made by either the primary information server or by some other method.

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As one example implementation of the decision criteria implemented in a primary information server, a table or matrix can be stored and maintained at the primary information server 54 which showing the relationship between each information server 54, 56, 58 and the particular terminal. The matrix preferably contains the round trip times for messages sent back and forth between each information server and the terminal. The information in the matrix can be updated continuously or periodically as desired. This information server determination method has several advantages. First, with such a matrix stored at the primary information server, the primary information server can quickly and accurately determine which information server is best suited to serve a particular banner to a particular terminal. Also, the time for the primary information server to make a decision is very fast and does not require additional searches of the computer network 30. Furthermore, the primary information server will know exactly which information server served each and every banner to every terminal on the computer network, which can be very valuable for evaluating the efficiency of the method 110.

This information server determination method described above does, however, also have several disadvantages. First, a significant effort is needed to generate the matrix and the information stored in the matrix, particularly if the computer network is quite large. More specifically, this method requires that monitoring software and/or hardware be operating at each information server to measure the round trip times between the information servers and the terminals. In addition, the matrix at the primary information server will need to be updated with the information created by the monitoring software and hardware at the mirror information servers so that accuracy of the matrix is maintained. Since the computer network may be continuously changing or evolving as new devices and networks are connected or disconnected from the computer network, and portions of the computer network may become temporarily disabled or offline, the overhead of monitoring the round trip times can be significant. The ability to create a matrix with the round trip times between all of the information servers and all of the terminals may take too long to develop, particularly if there is a significant number of terminals that do not ever request a banner stored on the information servers. This problem can be reduced by assuming that the round trip time between an information server and a particular terminal is the same, or at least approximately the same as, for example, other terminals connected to the same proxy server, the same as other terminals connected to the same sub-network, or the same as other terminals in a /24 network (a set of 256 contiguous IP addresses).

Another method in which the information server is best suited for serving a particular banner to a particular server uses and takes advantage of the Domain Name System (DNS) already being implemented on the Internet. As previously discussed above, DNS is a system for resolving or determining the thirty-two bit Internet Protocol (IP) addresses for each host computer or network device on the computer network. Every time a signal is generated by terminal or other device connected to the computer network requesting access to, or communication with, another device on the computer network, the IP address for the desired device must be determined if the signal does not already contain the IP address.

The DNS process is very complex and so a complete description of it is beyond the purview necessary for a complete understanding of the present invention. In addition, the DNS process is well known to people of



ordinary skill in this art. For purposes of a general explanation of how the DNS process can be used for selection of the information server to serve a banner to a particular terminal, the DNS process uses name servers or resolvers located in the computer network to determine the IP addresses. The name servers maintain listings of each computer or device in the computer network and their IP addresses. If a particular name server does not know a specific IP address when it is queried for the IP address, the name server can forward the query to another name server. Once the correct IP address is determined, it is passed along the reverse path to the terminal and is stored on all name servers who received the query and forwarded the query along.

With the present invention, each information server **54**, **56**, **58** operates a name server. Furthermore, each name server is configured to respond to a DNS request with the IP address of the information server containing the name server. When the banner location signal is returned to the terminal **36** during the step **114** from the primary information server **54**, the banner location signal contains a reference or general URL address of the banner to be served to the terminal, but not the specific IP address. The terminal **36** then initiates a DNS name resolving process prior to step **116** to determine the information server from which to serve the desired banner. Upon receiving the name resolving request from the terminal **36** or its nearby DNS name server, over the course of several transactions, each of the name server in each information servers returns an IP address to the terminal containing the IP address of the information server in which the name server is located. That is, name server in the information server **56** returns the IP address of the information server **56**, while the name server in the information server **58** returns the IP address of the information server **58**, etc. All of the IP addresses becomes stored in the DNS name server closest topologically to the terminal **36** since that DNS name server would have been the first name server to receive the name resolution request from the terminal **36**. The DNS name server keeps a list of all of the IP addresses for all of the information servers and the round trip times for communications between the DNS name server and the name servers located at the information servers. The round trip times are initially set to zero. When the DNS name server gets a request from the terminal **36**, it selects the information server having the shortest round trip time and provides the terminal **36** with the IP address of the selected information server. Since initially all of the round trip times are set to zero (0), the DNS server will randomly select one IP address and return it to the terminal **36**. The DNS name server will then monitor the round trip time between DNS server and the information server and update DNS name server's round trip time list for the particular information server's IP address returned to the terminal **36**. The next time the terminal **36** requests name resolution from the DNS server, the DNS name server will return the IP address of a different information server since the round trip time of the first information server will no longer be zero (0). After this process is implemented at least as many times for each terminal or each specified group or domain of terminals as there are information servers, the best information server for serving banners to the terminals or groups or domains of terminals will be determined and the appropriate IP addresses will be returned to the terminal requesting the DNS process. The standard DNS process includes ways for insuring that the route trip times are updated so that particular terminals are not locked into always receiving banners from particular information servers if other information

servers become better suited for serving banners to the particular terminals.

This second information server determination method described above has several advantages. Unlike the first method described above, this method takes advantage of the already existing DNS process and requires no special monitoring or sniffing software or hardware to be installed at the information servers. Also the second method does not require a matrix to be generated and stored in the primary information server or updates to a matrix to be made. In comparison, the operation of a name server at each mirror site is simple to implement and operate. Therefore, in contrast to the first method, the second method is easy and relatively inexpensive to implement. Unfortunately, in contrast to the first method, the second system may be less precise and take longer to implement since a DNS search or rotation process will have to be implemented each time a banner is to be served to a terminal. In addition, until the round trip times for each information server are determined, the second method may produce less than optimal results. Furthermore, updating of the round trip time information may require using an information server other than the optimal information server to serve a particular banner to a particular terminal. Finally, the shortest round trip time between the DNS name server and the name servers at the information servers may not be an accurate reflection of the round trip times between the terminal and the information servers, particularly if a given user's DNS name server is topologically distant from the terminal. As a result, the information server selected by the DNS name server may not always have the shortest round trip time to the terminal.

Other methods for determining which information server is best suited to serve a particular banner to a particular terminal include looking at the information, if any, about the terminal received in the initial banner request signal generated during step **112**. The information might include things such as the country code or the network code in which or on which the terminal resides. In addition, the information might include information about how the initial banner request signal was routed from the terminal to the primary information server, thereby giving an indication of the topological location of the terminal in the computer network. The primary information server can then use this information dynamically or in conjunction with a matrix lookup process to determine which information server to select to serve the selected banner to the terminal requesting a banner.

Another important benefit of mirroring is that it allows for redundancy and back-up if one or more of the information servers connected to the computer network **30** goes offline or becomes otherwise inaccessible or incapable of serving banners to terminals. For example, in the preferred method, the initial banner request signal is preferably sent by a terminal to the primary information server **54** during the send initial banner request signal step **112**, thereby allowing the primary information server **54** to be the centralized source of intelligence and the centralized source of banner display monitoring and counting. If however, the primary information server **54** becomes disabled or goes offline for any reason, one of the mirror information servers **56**, **58** can temporarily or permanently become the primary information server for the computer network **30**, thereby allowing the delivery of banners to terminals to continue. Preferably, the switch from the disabled primary information server **54** to the back-up information server **56** or **58** can take place very quickly such that little impact on the delivery of banner information is noticed or even created. It should be noted,



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however, that the backup primary information server will need to contain all of the centralized intelligence, databases, banner counting and monitoring software, etc. operating on the original primary information server **54** such that the backup primary information server can operate appropriately if the original primary information server **54** becomes disabled or goes offline.

The switch over to the backup primary server can be handled in a variety of ways. For example, once again taking advantage of the Domain Name System (DNS) process and Internet Protocol (IP) addresses, both the primary information server and the backup information server will operate a name resolver or name server such that when the initial banner request signal is generated during the step **112** that does not contain the needed IP address, the IP address for the primary information server is returned to the terminal **36** and stored in all name servers receiving and processing the query for the IP address of the primary server. The backup information server will monitor the primary information server and, in the event that the primary information server goes offline or becomes otherwise disabled, the backup information server will shut down or disable the name server at the primary information server. Furthermore, the backup information server will begin returning its IP address instead of the IP address of the primary information server when queries are received. All IP address information stored in name servers has a time-to-live (TTL) value that is set by the name server returning the IP address. When the TTL value expires, the IP address information is no longer stored in the name server and the name server will have to forward any requests it receives for the IP address. Therefore, when either of the name servers in the primary information server or the backup information server returns an IP address for the primary information server, the IP address is set to have a finite TTL value of, for example ten to thirty minutes. In the event of the primary information server going offline, eventually the IP addresses for the primary information server stored in the name servers will expire and queries for the IP address will reach the name server in the backup information server which will then return its IP address instead of the IP address of the primary information server. Thus, within a finite time and selected TTL, all name servers in the computer network that have stored or cached the IP address of the primary information server will have their caches or memory cleared. They will then ask for new addresses and receive the IP addresses of the backup information server in response.

The use of a centralized primary information server along with at least one mirror information server on a computer network provides significant advantages for the delivery of banners containing advertising information to a terminal for display on the terminal. First, advertising banners are in most cases going to be delivered to the terminal requesting the advertising banner in quick and efficient manner since the information server best suited for delivering and serving a banner to a terminal will in most cases be the information server selected by the primary information server to deliver the banner to the terminal. The faster the advertising banner is delivered to a terminal, the more likely the user at the terminal is to look at the advertising banner, particularly if the advertising banner is displayed on the user's terminal for a longer period of time before the user exits the web page or selects a new page. In addition, mirroring of information servers allows for the relatively fault tolerant delivery of advertising banners to users at the terminals, thereby reducing or even eliminating lost opportunities to display advertising banners on terminals when the primary information

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server becomes disabled or otherwise goes offline. Furthermore, centralizing the intelligence at a primary information or ad server allows the displays of advertising banners to be continuously and accurately monitored, thereby increasing the ability to judge the success or failure of specific advertising banners.

The foregoing description is considered as illustrative only of the principles of the invention. Furthermore, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and process shown and described above. Accordingly, all suitable modifications and equivalents may be resorted to falling within the scope of the invention as defined by the claims which follow. For example, while the method **110** of the present invention is directed primarily to the accurate counting of banner information displayed with web pages, the method **110** can also be used to provide an accurate count of the number of times specific web pages are displayed on a user's terminal by creating a send initial page request signal step in a similar manner to the send initial banner request step **112** and a return page address location step in a similar manner to the return banner location step **114** prior to the storage determination step **76**. In addition, while the method **110** of the present invention has been described with connections to the computer network **30** being made primarily by terminals, computers, and proxy servers, it should be appreciated that the method **110** will also be suitable for use with other devices connected between the user's terminal and the computer network may exist which can cache or store the web pages or the banner information.

As yet another example of how the method **110** can be modified, if a primary information server receiving the initial banner request signal generated by a terminal during step **112** determines that the primary information server itself is the information server best suited for downloading or serving a selected banner to the terminal, the primary information server may, instead of sending a banner location signal to the terminal during the step **114**, simply transmit the selected banner to the terminal directly, thereby eliminating some of the steps in the method **110**.

As yet another example of how the method **110** of the present invention can be modified, it is possible to move the steps **112** and **114** to between the steps **92** and **116** in FIG. **4** so that the steps **112** and **114** are no longer performed after step **88** and before step **92**. The steps **112** and **114** are instead implemented after the step **92** and before the step **116** if the answer in step **92** is "no". In this embodiment, web pages and banners that are stored in a user's terminal are automatically reloaded and displayed on the user's terminal without generating additional signals on the computer network. Therefore, if a user "backs" through a page, i.e., the user moves through a series of pages, each of which are displayed on the user's terminal and stored in the terminal's memory along with the page's associated banners, and then decides to review or redisplay some of the pages (such as by using the "back" function of the browser software operating on the user's terminal), no initial banner request signal is generated during the step **112** since the steps **88**, **92**, **94** will be followed in sequence. While this embodiment of the method **110** of the present invention does not allow the redisplay of the banners on the same terminal (and presumably to the same user) to be counted or monitored, it still allows the redisplay of banners stored in the proxy server, but which are requested to be displayed on different terminals (and presumably to different users), to be counted and monitored.



While the method **110** of the present invention has been discussed in detail primarily with the counting, monitoring, and targeting of advertising or other content over computer networks, the method **110** can also be used for the counting, monitoring, or targeting of content or banners over local area networks, e-mail networks, and non computer networks such as switched-network cable television. In addition, the method **110** can easily be implemented to monitor levels of content sophistication, content language, content type, content levels of summarization, etc. when different content options are selectable by a user or terminal.

It should also be noted that, while the terms information server, computer site, web site, server, media property have been used to describe the method **110** of the present invention, the terms have been used only to help clarify different portions of the method **110**. Thus, an information server could also function as a computer site, a computer site could also function as an information server, and both could be labeled generically as servers. The method **110** of the present invention, therefore, should not be limited by the terminology used to describe different aspects of the present invention.

What is claimed is:

**1.** A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising:

- 50 serving a first portion of information to a terminal, wherein said first portion of information contains a reference to a second portion of information;
- causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal includes information intended to prevent said first request signal from being blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;
- 55 sending a location signal from the primary server to the terminal providing said location address of said second portion of information;
- causing a second request signal to be transmitted from the terminal containing said location address of said second portion of information and requesting said second portion of information be served to the terminal; and
- 60 serving said second portion of information to the terminal.

**2.** The method of claim **1**, wherein said intermediary device is a proxy server.

**3.** The method of claim **1**, wherein said second portion of information is served from the primary or secondary servers.

**4.** The method of claim **1**, wherein said first request signal is a content general request signal.

**5.** The method of claim **4**, wherein said second request signal is a content specific request signal.

**6.** The method of claim **1**, wherein said second portion of information is served from one of the secondary servers.

**7.** The method of claim **1**, wherein after the primary server receives the first request signal from the terminal, further including determining which server connected to the com-

puter network is best suited for serving said second portion of information to the terminal.

**8.** The method of claim **7**, wherein results of said determining are included in said location signal sent from the information server to the terminal.

**9.** The method of claim **8**, including creating a matrix of selections between each of the terminals or groups of terminals and each of the servers and using said matrix to determine which of the servers is best suited to serve said second portion of information to the terminals or groups of terminals.

**10.** The method of claim **9**, wherein said selections contain round trip times between the servers and the terminals or groups of terminals.

**11.** The method of claim **1**, including making one of the secondary servers a new primary server if the original primary server becomes inaccessible.

**12.** The method of claim **1**, including storing said second portion of information in the terminal.

**13.** The method of claim **1**, wherein said first request signal includes the strings "cgi-bin" and "?".

**14.** The method of claim **4**, including selecting the composition of said second portion of information.

**15.** The method of claim **14**, wherein the results of said composition selection are included in said location signal sent from the information server to the terminal.

**16.** The method of claim **1**, wherein said location signal includes an HTTP 302 redirect command.

**17.** The method of claim **1**, wherein said reference to a second portion of information includes at least a portion of a URL.

**18.** The method of claim **1**, wherein said first portion of information is a web page, said second portion of information is a banner, and said reference is a link.

**19.** The method of claim **1**, including counting at least one display of said second portion of information on the terminal.

**20.** A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a document served to the device, wherein the banner is stored in one or more servers, comprising:

- receiving a first banner request signal from a device at a first server requesting that a banner be served to the device, wherein said first banner request signal includes information intended to prevent said first banner request signal from being blocked from reaching said first server by the device despite previous caching of said specified banner in the device;
- 65 sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and
- receiving a second banner request signal from the device at said second server requesting that the second server serve said specified banner to the device.

**21.** The method of claim **20**, wherein said second server is said first server.

**22.** The method of claim **20**, including determining which of the servers is best suited for serving said specified banner to the device.

**23.** The method of claim **22**, wherein said determining which of the servers is best suited for serving said specified banner to the device is performed in said first server after said first server receives said first banner request signal from the device.

**24.** The method of claim **20**, wherein said first banner request signal is a content general banner request signal.



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25. The method of claim 24, wherein said second banner request signal is a content specific banner request signal.

26. The method of claim 20, including storing said specified banner in said device.

27. The method of claim 26, including determining whether said specified banner is stored in the device before said receiving said second banner request signal.

28. The method of claim 20, including selecting said specified banner prior to sending said banner location signal from said first server to the device.

29. The method of claim 20, wherein all of the banner information stored on said first server is also stored on said second server.

30. The method of claim 20, including counting a display of said specified banner on said device.

31. The method of claim 20, wherein said location information includes at least a portion of a URL.

32. The method of claim 20, wherein said first request signal includes the strings "cgi-bin" and "?".

33. The method of claim 20, wherein said banner location signal includes an HTTP 302 redirect command.

34. A method for enabling a web page and an associated banner to be served to a computer, wherein the web page contains a link or other reference to the banner, comprising:

    serving a web page to a computer;

    causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes a Uniform Resource Locator address for said primary server and wherein said banner request signal includes information intended to prevent said banner request signal from being blocked from being received by the primary server as a result of previous caching of the banner on the computer;

    determining which specified banner will be served to the computer; and

    sending a banner location signal from said primary server to the computer, wherein said banner location signal includes the Uniform Resource Locator address for a device on which the specific banner to be served to the computer is stored.

35. The method of claim 34, wherein said banner request signal includes a content general Uniform Resource Locator address.

36. The method of claim 34, including determining whether said specified banner is stored on the computer.

37. The method of claim 36, wherein after said determining whether said specified banner is stored on the computer, if said specified banner is not stored on the computer then including causing a second banner request signal to be sent to said device requesting that said device serve said specified banner to the computer.

38. The method of claim 37, including serving the specified banner from said device to said computer.

39. The method of claim 34, wherein said banner location signal constitutes an HTTP 302 redirect signal.

40. The method of claim 35, wherein said banner location signal includes a content specific Uniform Resource Locator address for the specified banner.

41. The method of claim 34, including tagging said specified banner as being cachable.

42. The method of claim 34, wherein said device is said primary server.

43. A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising:

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receiving a first banner request signal from the device at a first server requesting that a banner be served to the device, wherein said first banner request signal includes information intended to prevent said first banner request signal from being blocked by the device or an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device;

determining if said first server is best suited to serve said banner to the device and serving said banner to the device if said first server is best suited to serve said banner and, if said first server is not best suited to server said banner to the device, sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server;

receiving a second banner location request signal from the device at said second server requesting that said second server serve said specified banner to said device if said first server is not best suited to server said banner to the device; and

serving said specified banner to said device from said second server if said first server is not best suited to server said banner to the device.

44. The method of claim 43, wherein said document is a web page.

45. The method of claim 43, wherein said first banner request signal includes the strings "cgi-bin" and "?".

46. The method of claim 45, wherein said banner relocation signal includes an HTTP 302 redirect command.

47. The method of claim 43, wherein said banner location information includes at least a portion of a URL.

48. The method of claim 43, including counting at least one display of said specified banner on the device.

49. A method for enabling distribution of a banner over a computer network to a device when the banner is referenced in a document served to the device, wherein the banner is stored in one or more servers connected to the computer network, and the device is connected to the computer network via an intermediary server, comprising:

    causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal includes information intended to make said first banner request signal not blockable by the device or the intermediary server as a result of a storage in the device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device;

    sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for said requested banner stored on a second server; and

    determining if said requested banner is stored on the device and, if said requested banner is not stored on the device, then causing a second banner request signal to be transmitted from the device to the intermediary server and determining if said requested banner is stored on the intermediary server, wherein if said requested banner is not stored on the intermediary server, causing at least a portion of said second banner request signal to be sent to said second server requesting that said second server serve said requested banner to said device.



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50. The method of claim 49, wherein said second server is said first server.

51. The method of claim 49, wherein said first banner request signal is a content general request signal.

52. The method of claim 51, wherein said second banner request signal is a content specific request signal.

53. The method of claim 49, including having said first server select said requested banner.

54. The method of claim 49, wherein said first banner request signal includes the strings "cgi-bin" and "?".

55. The method of claim 49, wherein said banner location signal includes an HTTP 302 redirect command.

56. The method of claim 49, wherein the document includes at least a portion of a web page.

57. The method of claim 49, wherein said location information includes at least a portion of a URL.

58. The method of claim 49, including counting at least one display of said specified banner on the device.

59. A method for serving a banner to a client device, comprising:

receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request includes information intended to prevent said first request from being blocked from the primary server despite previous storage of the banner on the client device;

sending a signal from the primary server to the client device that includes at least a portion of a second URL associated with the banner's location;

receiving at the primary server a second TCP/IP compliant request requesting that the banner be served to the client device if the banner is not stored on the client device;

serving the banner to the client device; and counting at least one display of the banner on the client device.

60. The method of claim 59, wherein said first request includes the strings "cgi-bin" and "?".

61. The method of claim 59, wherein said signal sent from said primary server to the client device includes an HTTP 302 redirect command.

62. The method of claim 59, wherein said first request cannot be prevented from being received by the primary server as a result of previous caching or storing of the banner by an intermediary device connected to the computer network.

63. The method of claim 62, wherein said intermediary device is connected topologically on said computer network between the client device and the primary server.

64. A method for enabling accurate counting of displays of a banner on a client device, comprising:

receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request includes information intended to prevent said first banner request signal from being blocked from said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary device;

sending a banner location signal to the client device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

causing a determination of whether said specified banner is stored on the client device and, if said specified banner is not stored on the client device, receiving a second banner request signal from the client device at

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said intermediary device and causing a determination of whether said specified banner is stored on said intermediary device, wherein if said specified banner is not stored on said intermediary device, receiving a third banner request signal at said second server requesting that said second server serve said specified banner to the client device.

65. The method of claim 64, wherein said intermediary device is a proxy server.

66. The method of claim 64, wherein said third banner request signal is identical to said second banner request signal.

67. The method of claim 64, wherein said banner location signal includes an HTTP 302 redirect command.

68. The method of claim 64, wherein said first banner request signal includes the strings "cgi-bin" and "?".

69. The method of claim 64, wherein said first server and said second server are the same server.

70. The method of claim 64, including serving said specified banner to the client device.

71. The method of claim 70, including counting at least one display of said specified banner on the client device.

72. A method for serving a banner to a client device, comprising:

receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal includes information intended to prevent said first request signal from being blocked from the primary server as a result of previous caching of the banner in the client device;

sending a signal from the primary server to the client device that includes a second URL associated with the banner's location;

receiving a second request signal requesting that the banner be served to the client device if the banner is not stored on the client device; and

serving the banner to the client device.

73. The method of claim 72, including counting at least one display of the banner on the client device.

74. The method of claim 72, wherein said first request signal includes the strings "cgi-bin" and "?".

75. A method for enabling a banner to be received at a client device, comprising:

generating at the client device a first request signal for a banner;

transmitting said first request signal to a server, wherein said first request signal includes information intended to prevent said first request signal from being blocked from the server as a result of previous caching of the banner on the client device;

receiving at the client device a response signal from the server that includes a URL associated with the banner's location; and

transmitting a second request signal from the client device requesting that the banner be served to the client device.

76. The method of claim 75, wherein said first banner request signal includes the strings "cgi-bin" and "?".

77. The method of claim 75, wherein said response signal includes an HTTP 302 redirect command.

78. The method of claim 75, including receiving the banner at the client device.

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