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(54) **SYSTEMS AND METHODS FOR ENHANCED PRINTING OF ONLINE CONTENT**

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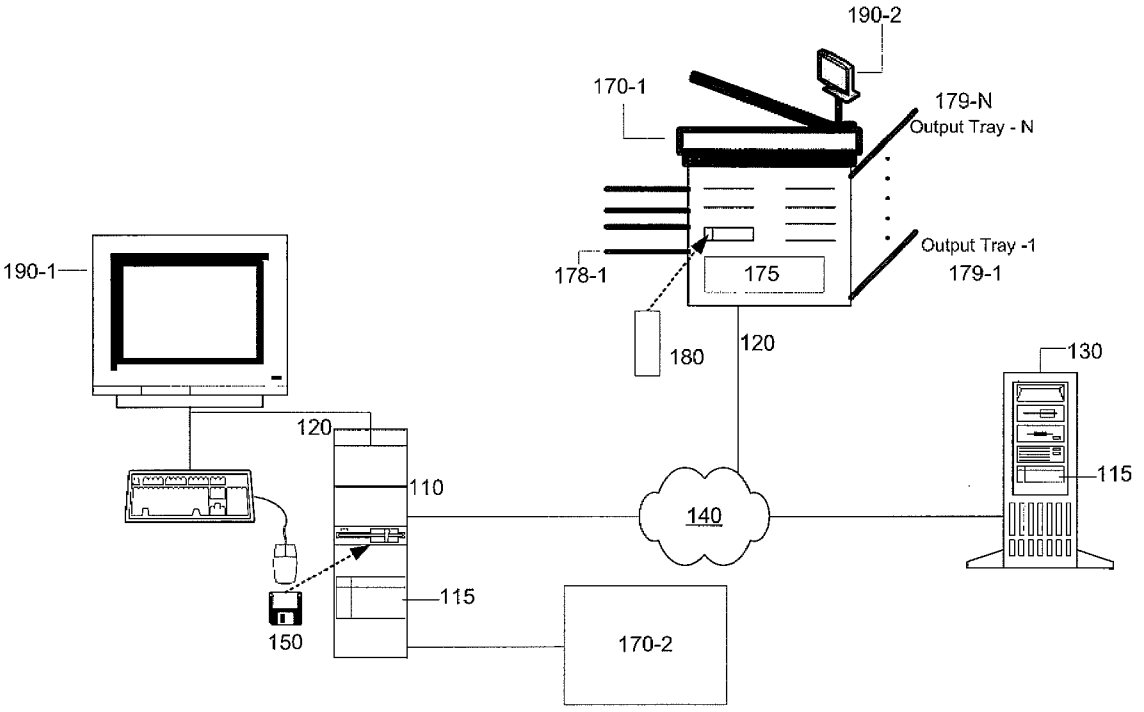
(57) **ABSTRACT**

Methods disclosed permit the printing of online content in a manner that optimally uses printer capability. A method for printing web page content can comprise: receiving a print request for a first print data associated with the web page at a printer, wherein the print request includes the web-page URL; generating a request for a second print data, wherein the request for the second print data is based on the web-page URL, and the second print data is associated with the first print data; and printing according to the second print data received in response to the request. For example, for online maps, the first print data can be low resolution map data while the second print data can be higher resolution map data. For online images, the first print data can be RGB image data while the second print data can be CMYK image data.



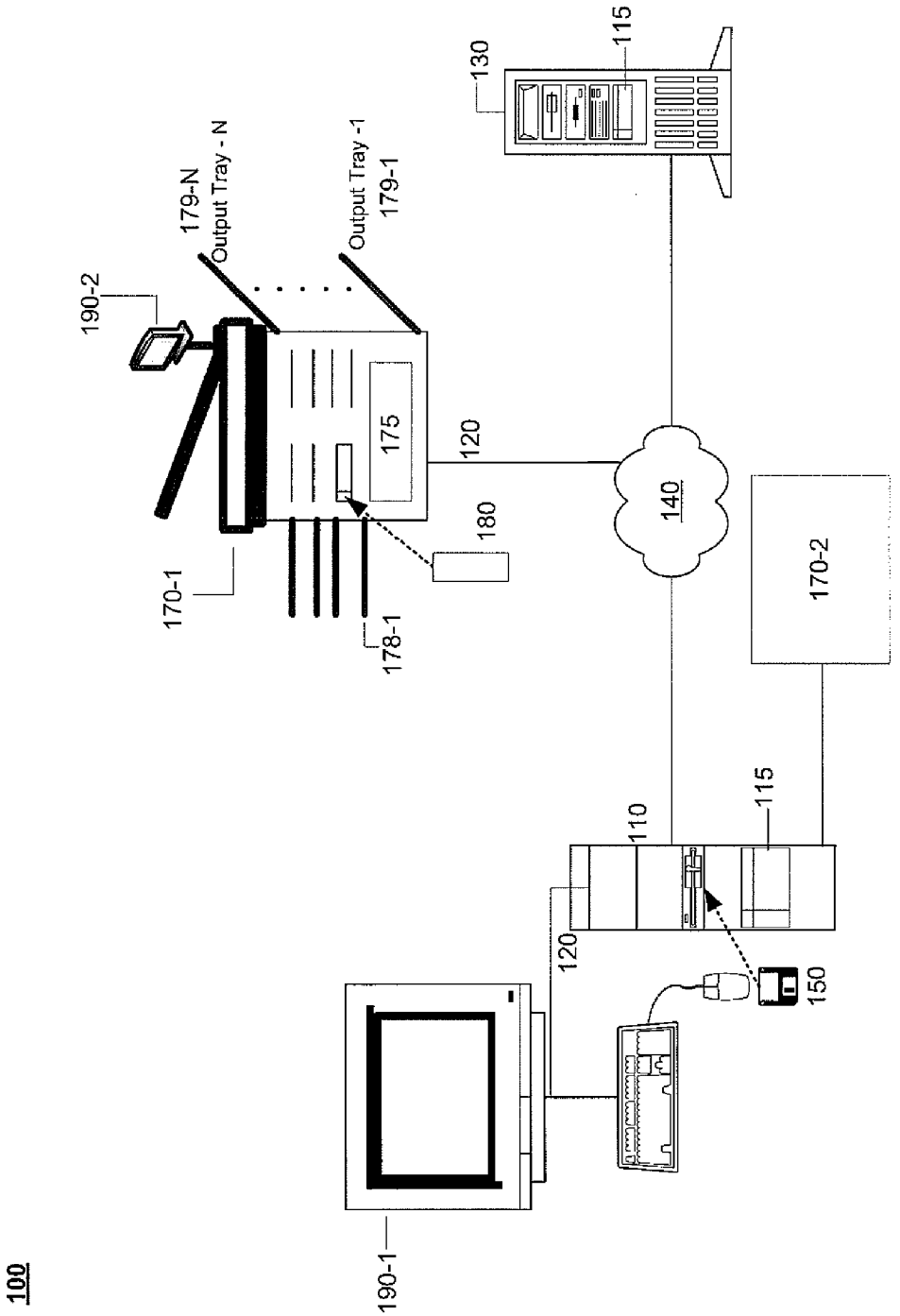

100
190-1
190-2
179-N
Output Tray - N
Output Tray -1
179-1
130
115
175
120
140
180
170-1
178-1
170-2
110
115
120
150

FIG. 1

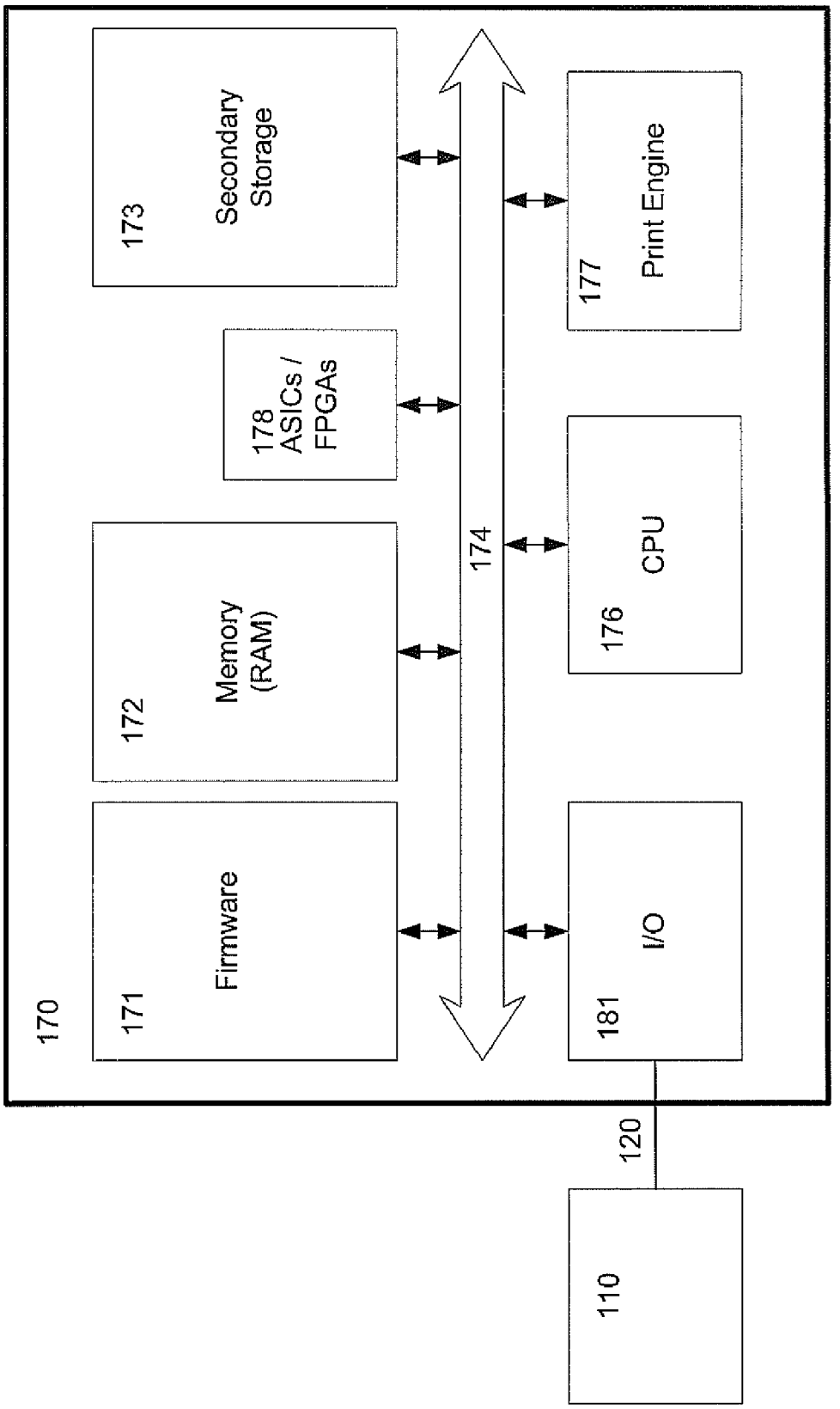

170
171
Firmware
172
Memory
(RAM)
173
Secondary
Storage
178
ASICs /
FPGAs
174
176
CPU
177
Print Engine
181
I/O
120
110

FIG. 1A

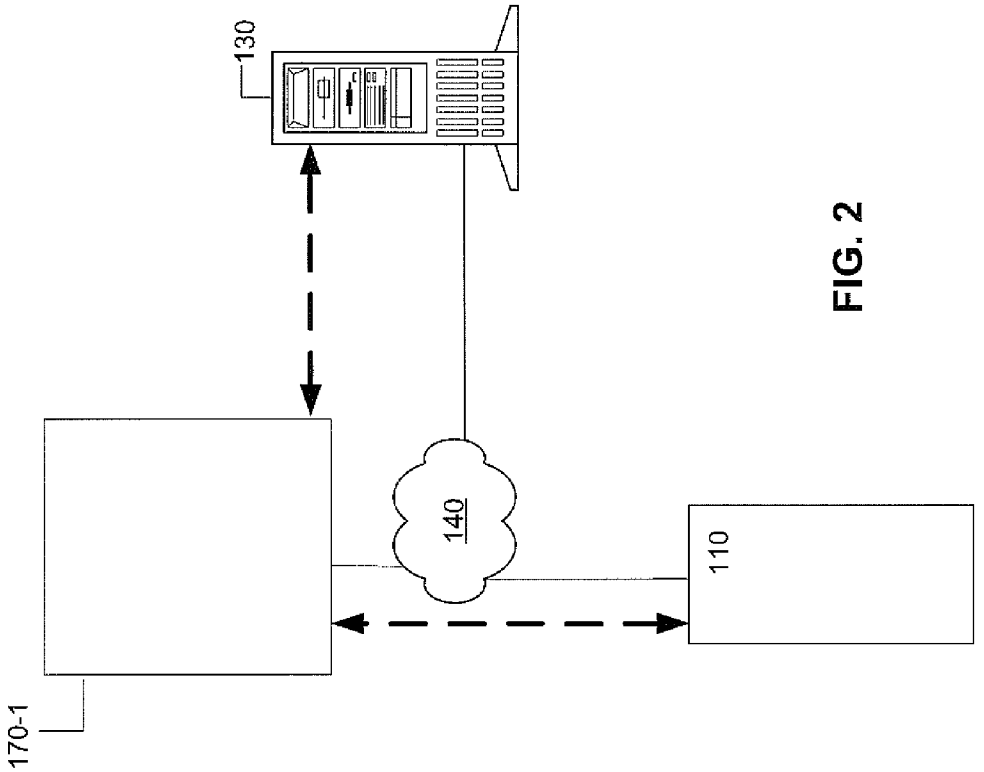


FIG. 2

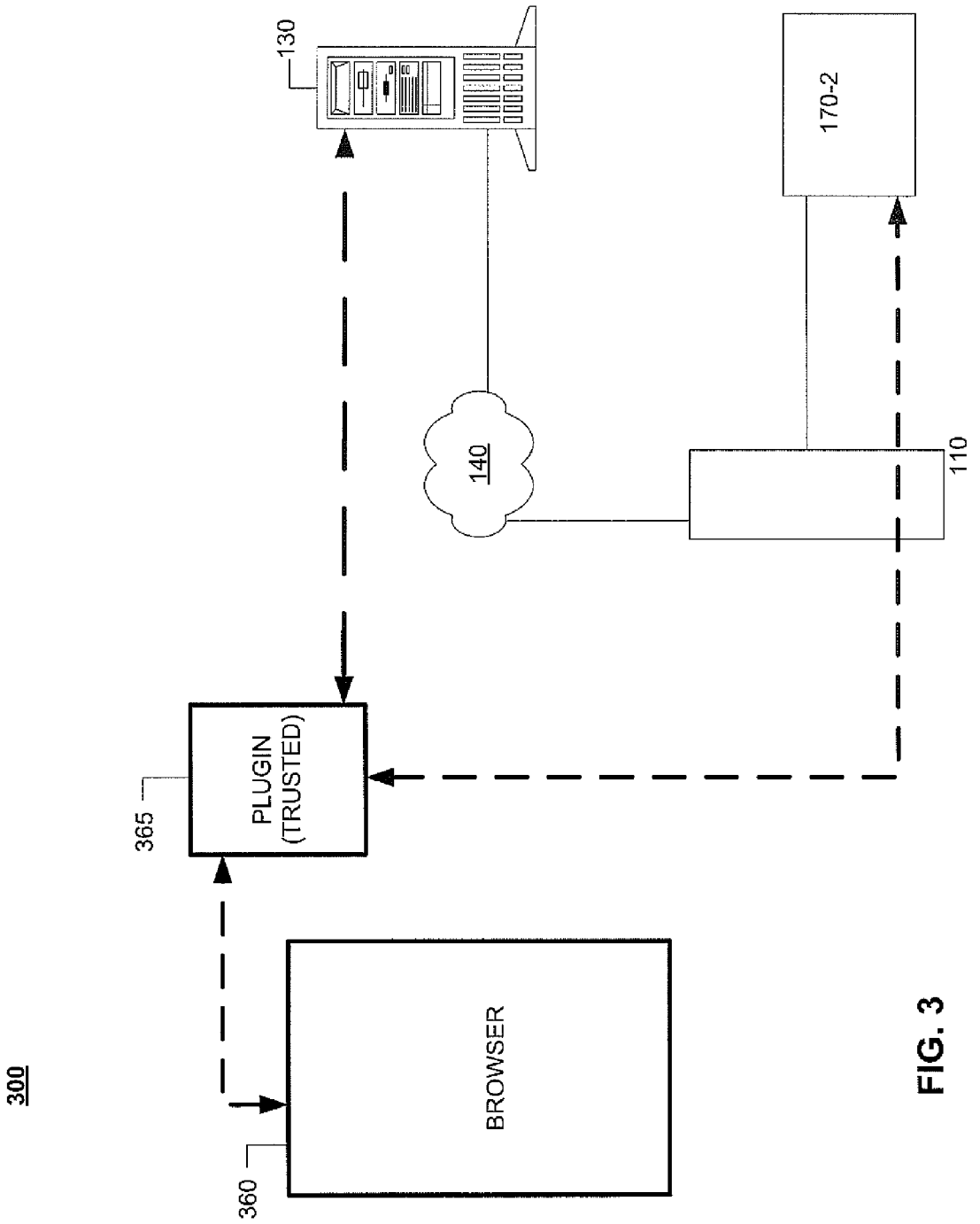


FIG. 3

SYSTEMS AND METHODS FOR ENHANCED PRINTING OF ONLINE CONTENT

BACKGROUND

[0001] 1. Field of the Invention

[0002] The present invention relates to the field of printing and in particular, to systems and methods to enhance the printing of online content by printers through techniques that facilitate optimal usage of printer capabilities.

[0003] 2. Description of Related Art

[0004] Computer printers, which are ubiquitous in most modern organizations, permit the quick printing of stored documents. Designers of modern printers have focused relentlessly on improving printer speed, efficiency, color accuracy, and cost resulting in virtually universal adoption of printers. Thus, even many low cost printers are capable of printing data at relatively high resolutions. For example, many printers are capable of printing at resolutions of 600 dots per inch ("dpi") or at even higher resolutions.

[0005] However, for a variety of reasons, many applications do not make optimal use of printer capability. For example, Internet-based map services such as Google™ Maps (maps.google.com) or Yahoo™ Maps (maps.yahoo.com) allow users to rapidly generate and view a map of almost any location in the world at a variety of scales while overlaying a variety of data layers. The resulting maps are of adequate quality for viewing on a computer monitor. On a computer monitor, subject to the limits of map source data users can zoom in on features of interest, so the limited resolution (typically 72 dots per inch) of the monitor does not significantly impede map usability. However, when the map is printed the hard copy produced by the printer is the same resolution as monitor data and is far below the 600 dpi that a typical printer can produce, and far below what users typically expect from printed output. Consequently, printed copies of online maps are of typically of poor quality relative to normal paper maps. Because of the low resolution of the printed online map, small fonts can be difficult to read and geographic detail is difficult to resolve.

[0006] Although map data is available at high resolution, map servers typically use a Vector Markup Language ("VML") or other such vector description to store map data. VML is typically not supported by web browsers. Therefore, map servers typically service user map requests by generating map data with a non-VML raster-based format and at a lower resolution supported by a large number of browsers and monitor screens. Further, serving map data at lower resolution requires lower network bandwidth allowing servers to service a greater number of user requests. Moreover, only a fraction of map request users may want to print the maps, so serving high resolution maps may not be the best use of resources. In addition, map services may want to limit release of valuable vector map data, which may be susceptible to theft, if delivered in vector format to users.

[0007] In general, because of the differences between monitor and printer capabilities, information security concerns, network bandwidth issues, and/or browser capabilities, online services may not be making use of printer resources in an optimal manner. Therefore, there is a need for systems and methods to allow online services to optimally use printer capabilities in a manner, which: addresses information security concerns of the service providers; has limited impact on network bandwidth; and permits the service provider to continue supporting a variety of browsers.

SUMMARY

[0008] Consistent with embodiments disclosed herein, systems and methods for printing online documents in a manner that optimizes use of printer capabilities are presented. In some embodiments, a method for printing data associated with a web page comprises the steps of: receiving a print request for a first print data associated with the web page, wherein the print request includes the URL of the web page; generating a request for a second print data, wherein the request for the second print data is based on the URL of the web page, and the second print data is associated with the first print data; and printing according to the second print data received in response to the request for the second print data.

[0009] Embodiments also relate to software, firmware, and program instructions created, stored, accessed, or modified by processors using computer-readable media or computer-readable memory. The methods described may be performed on a computer, print controller, and/or a printing device.

[0010] These and other embodiments are further explained below with respect to the following figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** shows a block diagram of an exemplary system for printing online documents consistent with disclosed embodiments.

[0012] FIG. **1**A shows a high-level block diagram of an exemplary printer coupled to a computing device.

[0013] FIG. **2** shows an exemplary system for permitting the printing of online documents in a manner that permits optimal use of the capabilities of a printer.

[0014] FIG. **3** shows another exemplary system for permitting the printing of online documents in a manner that permits optimal use of the capabilities of a printer.

DETAILED DESCRIPTION

[0015] In accordance with embodiments disclosed herein, systems and methods to permit online services to optimally use printer capabilities are presented.

[0016] FIG. **1** shows a block diagram of exemplary system **100** for printing documents consistent with disclosed embodiments. A computer software application to enhance the printing of online data and/or documents may be deployed on a network of computers and/or printers, as shown in FIG. **1**, that are connected through communication links that allow information to be exchanged using conventional communication protocols and/or data port interfaces.

[0017] As shown in FIG. **1**, exemplary system **100** includes a computer or computing device **110** and a server **130**. Further, computing device **110** and server **130** may communicate over a connection **120**, which may pass through one or more networks **140**, which could include the Internet. Networks **140** may include subnets, LANs, and/or WANs. Further, network **140** may also include modems, routers, repeaters, and other communication devices (not shown) that permit devices that are coupled to a network **140** to communicate with other devices. For example, as shown in FIG. **1**, printers **170-1** and other printers and peripherals (not shown) may be capable of communicating with each other and with other devices coupled to network **140**.

[0018] Computing device **110** may be a computer workstation, desktop computer, laptop computer, or any other computing device capable of being used in a networked environment. Server **130** may be a platform capable of connecting to computing device **110** and other devices too (not shown). Computing device **110** and server **130** may include processors that are capable of executing a variety of software applications, such as web browsers, device drivers, and software to communicate with servers **130** and/or printers **170** to permit optimal use of printer capabilities. In one embodiment, server **130** may run applications such as a map server application that serves maps over the Internet in response to user requests. In another embodiment, server **130** may run an image server application that serves images over the Internet in response to user requests. In one embodiment, server **130** may provide an online service to permit the printing of photographs or images stored on server **130** to printer **170** over the Internet. In some embodiments, server **130** may respond to user requests sent using a web browser such as Firefox™, Netscape™, Safari™, Chrome™, Internet Explorer™ and other browser applications.

[0019] Printer **170** may be a laser printer, an ink jet printer, an LED printer, a plotter, and of various other types. From a functional perspective, printers **170** may take the form of computer printers, facsimile machines, digital copiers, multifunction devices, and/or various other devices that are capable of printing documents. Computing device **110** and server **130** may contain secondary storage **115**, which may include removable media accessed using removable media drive **150**. Secondary storage **115** may include one or more hard disks, fixed flash memory, and/or other non-volatile memory. Removable media drive **150** may include, for example, 3.5 inch floppy drives, CD-ROM drives, DVD ROM drives, CD±RW or DVD±RW drives, USB™ flash drives, Memory Sticks™, Secure Digital High Capacity ("SDHC") cards, and/or any other removable media drives consistent with disclosed embodiments. Portions of software applications for optimal printing may reside on removable media and be read and executed by computing device **110** using removable media drive **150**.

[0020] Connection **120** couples computing device **110**, server **130**, and printers **170-1**-**170-2** to network **140**. Connection **120** may be implemented as a wired or wireless connection using conventional communication protocols and/or data port interfaces. In general, connection **120** can be any communication channel that allows transmission of data between the devices. In one embodiment, for example, the devices may be provided with conventional data ports, such as USB™, SCSI, FIREWIRE™, serial, parallel, and/or BNC ports for transmission of data through the appropriate connection **120**. The communication links could be wireless links or wired links or any combination that allows communication between computing device **110**, server **130**, and printers **170**.

[0021] Networks **140** could include a LAN, a WAN, or the Internet. Printers **170**, such as exemplary printer **170-1**, may be network printers that can be coupled to network **140** through connection **120**. System **100** may include multiple printers **170** and other peripherals (not shown). In some embodiments, computer **110**, server **130**, and printer **170** may communicate over network **140** using encryption schemes such as the Advanced Encryption Standard ("AES") and various other well-known encryption schemes.

[0022] Printers **170** may be controlled by processors and other hardware, firmware, or software. Printers **170** may include one or more print controller boards **175**, which may control the operation of printers **170** and may also perform portions of configuration and optimization of print functions. Printers **170** may be controlled by firmware or software resident on memory devices in print controller **175**. In general, print controller **175** may be internal or external to printers **170**. In some embodiments, printers **170** may also be controlled in part by software, including print servers, printer drivers, or other software, running on computing device **110** or server **120**.

[0023] Printers, such as exemplary printer **170-1**, may also include console **190** such as consoles **190-2**, or other interfaces to allow various configuration options to be set, print jobs to be selected for printing, passwords and/or user identification and authentication information to be entered, and other messages to be displayed. In some embodiments, configuration options may be set or displayed using a display or user interface on a monitor for a computer coupled to printers **170**. For example, user interfaces to set one or more configuration options on printer **170-2** may be displayed on console **190-1**.

[0024] Users may also be able to log in to a printer **170** to perform administrative functions such as to enable software or firmware on printer **170** to perform various functions. In some embodiments, the log-in process may require a password or other user-authentication mechanism. A user may also be able to specify input trays **178** and/or output trays **179** and the use of automatic document feeders to allow batch processing of documents. Printers **170** may have multiple input trays **178** and/or output trays **179**. Output trays **179** can hold printed documents that have been processed by a printer.

[0025] A computer software application to optimize the printing of online data and/or documents on printers **170** may be deployed on any of the exemplary computers **110**, server **130**, and/or printers **170** shown in FIG. **1**. For example, computing device **110** could execute software that interacts with software on server **130** to print documents on printer **170-1** in a manner that optimally uses the capabilities of printer **170**. As another example, some combination of hardware, software, and/or firmware on printer **170** may permit printer **170** to communicate with server **130** to optimally use printing capability of printer **170** to print documents that use data downloaded from server **130** over network **140**. In a further example, an application resident on print controller **175** could be configured to download data from server **130** and permit documents using the data to be printed on printer **170** in a manner that uses printer capabilities optimally. In general, applications may execute in whole or in part on one or more computers, servers, print controllers, or printers in system **100**. The embodiments described above are exemplary only and other embodiments and implementations will be apparent to one of ordinary skill in the art.

[0026] FIG. **1**A shows a high-level block diagram of exemplary printer **170** coupled to a computing device **110** over connection **120**. Exemplary printer **170** may contain bus **174** that couples CPU **176**, firmware **171**, memory **172**, input-output ports **181**, print engine **177**, and secondary storage device **173**. Exemplary printer **170** may also contain other Application Specific Integrated Circuits (ASICs), and/or Field Programmable Gate Arrays (FPGAs) **178** that are capable of executing portions of an application that permits optimal use of the capabilities of printer **170** when printing online documents. Exemplary printer **170** may also be able to access network storage devices over network **140**, communi-

cate with applications running on computer **110** or server **130**, as well as access secondary storage or other memory in computing device **110** using I/O ports **181** and connection **120**. In some embodiments, printer **170** may also be capable of executing software including a printer operating system, software to process VML data, encryption/decryption software, and other appropriate application software.

[0027] Exemplary CPU **176** may be a general-purpose processor, a special purpose processor, or an embedded processor. CPU **176** can exchange data including control information and instructions with memory **172** and/or firmware **171**. Memory **172** may be any type of Dynamic Random Access Memory ("DRAM") such as but not limited to SDRAM, or RDRAM. Firmware **171** may hold instructions and data including but not limited to a boot-up sequence, pre-defined routines including routines to process Printer Description Language ("PDL") data, routines to process VML data, routines to convert VML data to other printable data forms, encryption/decryption routines, configuration management, document processing, and other code. In some embodiments, code and data in firmware **171** may be copied to memory **172** prior to being acted upon by CPU **176**. Data and instructions in firmware **171** may be upgradeable using one or more of computer **110**, network **140**, removable media coupled to printer **170**, and/or secondary storage **173**.

[0028] Exemplary CPU **176** may act upon instructions and data and provide control and data to ASICs/FPGAs **178** and print engine **177** to generate printed documents. ASICs/FPGAs **178** may also provide control and data to print engine **177**. FPGAs/ASICs **178** may also implement one or more of configuration management, folder monitoring, and other print related algorithms. CPU **176** may be capable of encrypting and decrypting data, and communicating with software applications running on computer **110** and/or server **130**.

[0029] Intermediate and final printable data, messages, and configuration information pertaining to one or more printers **170** may be stored in memory **172** or secondary storage **173**. Exemplary secondary storage **173** may be an internal or external hard disk, or a memory stick, USB™ drive, SDHC™ card, flash drive, or any other memory storage device capable of being used by system **200**. In some embodiments, memory **172** or secondary storage **173** may hold information to establish printer **170** as a trusted client of a service provided by server **130**.

[0030] FIG. **2** shows exemplary system **200** for permitting the printing of online documents in a manner that permits optimal use of the capabilities of printer **170**. System **200** may include various other components that have not been shown to simplify description. In some embodiments, computer **110** may request a service from server **130** over network **140**. In response to the request, an application server program that delivers the service and runs on server **130** may send data to computer **110**. For example, a user on computer **110** may use a browser to invoke a map service provided by application server software (such as a map server application) running on server **130**. In response to the request, map data may be sent to computer **110** for display on a monitor such as monitor **190-1** through a web browser interface.

[0031] At some point, a user of computer **110** may invoke a print function, such as a "Print" option on the browser in order to print the current web-page on printer **170-1**. For example, the user may request printing of the map of some location, or driving directions from one place to another. In some embodiments, upon invocation of the print request, browser may commence generating PDL output for printing. In one embodiment, browser may also send the URL of the web-page to be printed to printer **170-1** either separately or as part of the PDL data. In some embodiments, printer **170-1** may parse the PDL data to determine and extract the URL of the page being printed. Further, printer **170** may then use the URL to request alternate data from the software application running on server **130** that is more suited to optimally utilize print capabilities of the printer.

[0032] For example, printer **170-1** may use the received or extracted URL to request higher-resolution VML map data from the map server running on server **130**. In one embodiment, printer **170-1** may request VML data using a pre-determined and/or agreed upon protocol. In another embodiment, printer **170-1** may use a pre-defined (and agreed upon) variation of the URL used by the browser to request the VML data. In some embodiments, printer **170-1** may also include hardware, software or firmware to process VML data.

[0033] In some embodiments, printer **170-1** may identify itself as a trusted client or consumer to the application server software running on server **130**. For example, printer **170-1** may digitally sign requests to the application server software running on server **130** to identify itself as a trusted client. The digital signature could be common to a given model of printer, or to a given printer company, or for greater security could be unique to each individual printer, or could be sent to printer **170** using a prearranged protocol when the user signs up for a service provided through server **130**. The dashed arrows in FIG. **2** indicate that data flow can occur between computer **110** and printer **170-1**. For example, computer **110** can send a first data, which can comprise PDL data, and also send the URL of the web-page to be printed to printer **170-1**. Data can also flow between printer **170-1** and server **130**. For example, printer **170-1** may send a request for second data associated with the first data (such as data in an alternate format or at a different resolution from the first data) to server **130** and server **130** may respond to the request with the second data.

[0034] In the map server example, in response to the request for higher resolution data from printer **170-1**, the map server may send printer **170-1** higher resolution VML or other vector format map data. In some embodiments, the data may be sent after verification of the digital signature provided by printer **170-1**. In some embodiments, the higher resolution map data may be encrypted prior to transmission. Upon receiving the higher resolution map data, printer **170-1** may decrypt and process the VML data to print a high resolution map. In some embodiments, printer **170-1** may discard the PDL data received from the browser after receiving the alternate data. If no data is received from server **130** in response to the request, then printer **170-1** may print the map using the PDL data.

[0035] It should be noted that the printing of high resolution maps represents only one possible application of the method disclosed and various other applications are contemplated. In general, in response to a print request with a first print data, printer **170-1** may request alternate or second print data from an application running on server **130** using network **140**. The second print data may be better suited for printing in accordance with the capabilities of printer **170-1**. In some embodiments, a user may directly enter a URL for the data to be printed by using a console such as console **190-2** coupled to printer **170-1**. In some embodiments, the user may also directly enter a URL to permit printer **170-1** to obtain the second print data by using a configuration interface for printer

170-1. For example, a GUI or a configuration web-page for printer **170-1**, such as an interface displayed on monitor **190-1**, may be used to enter the URL. Printer **170** may then process the URL in the manner recited above to obtain data from server **130** that makes more optimal use of its capabilities.

[0036] As another example, an image server application running on server **130** may serve images to a browser running on computer **110**. Because the images are typically displayed in a Red-Green-Blue ("RGB") format on monitors, image server may send RGB images to the browser for display on monitor **190-1**. When the user requests the printing of an image, printer may use the URL for the web-page corresponding to the image to request a Cyan-Magenta-Yellow-Black ("CMYK") equivalent of the RGB image for printing. In other words, the request for the CMYK equivalent of the RGB image may be based, in part, on the URL of the web page associated with the RGB image. Printers typically use the CMYK color space to process and render images. However, in addition to the time taken to convert images from RGB to CMYK, some color accuracy may be lost during the conversion process. If server **130** has both RGB and CMYK images then an image server may be able to serve RGB images to users for viewing and to allow users to select images for printing and then, in response to the printer's request, send the printer the selected CMYK images for printing using the methods disclosed.

[0037] As a further example, when browser **360** displays a web-page, data sent to browser **360** may use fonts supported by browser **360**. When the user requests printing of displayed content for the web page, printer **170-1** may request alternate data from the web-page with fonts supported by printer **170-1**. The request may be based, in part, on the URL of the web-page. Alternate print data with fonts supported by printer **170-1** may be sent to printer **170-1** by server **130**. Printer **170-1** may print the content associated with the web-page according to the received alternate print data.

[0038] FIG. **3** shows an exemplary system **300** for permitting the printing of online documents in a manner that permits optimal use of the capabilities of printer **170**. System **300** may include various other components that have not been shown to simplify description. In some embodiments, computer **110** may request a service from server **130** over network **140**. In response to the request, application server software running on server **130** may send data to computer **110**. For example, a user on computer **110** may use browser **360** to invoke a map service provided by an application server (such as a map server) running on server **130**. In response to the request, map data may be sent to computer **110** for display on a monitor such monitor **190-1** through web browser **360**.

[0039] At some point, a user of computer **110** may invoke a print function, such as a "Print" option on browser **360** to print the current web-page on printer **170-2**. For example, the user may request printing of the map of some location, or driving directions from one place to another. When the user invokes a print function, plug-in **365** on the browser may be invoked. In some embodiments, browser **360** may have several plug-ins **365** for various applications. For example, if a map is being printed a "Print Map" plug-in may be invoked. On the other hand, if an image is being printed then a "PrintCMYK" plug-in may be invoked.

[0040] In some embodiments, plug-in **365** may send a special control command to the server that can be based on the full URL of the current map view. In one embodiment, plug-in **365** may request alternate data from the application running on server **130** using an agreed upon protocol. In another embodiment, plug-in **365** may use a pre-defined variation of the URL used by the browser to request the alternate data. In some embodiments, plug-in **365** may send the URL to printer **170-2**, and printer **170-2** may request alternate data from the application server running on server **130** as described above with respect to FIG. **2**. In general, the upstream request from plug-in **365** can specify the data and format requested. The format requested may vary depending on the plug-in application, the services provided by the application server on server **130**, and the capabilities of printer **170-2**.

[0041] In some embodiments, plug-in **365** may identify itself as a trusted client or consumer to the software application running on server **130**. For example, plug-in **365** may digitally sign requests to the software application running on server **130** to identify itself as a trusted client. The digital signature could be common to a given model of printer, or to a given printer company, or for greater security could be unique to each individual printer, or could be sent to plug-in **365** using a prearranged protocol when the user signs up for a service provided through server **130** and/or downloads appropriate plug-in **365**. In some embodiments, plug-in **365** may send the data to printer **170-2** using computer **110**. The dashed arrows in FIG. **2** indicate that data flow can occur between the browser **360** to plug-in **365**. For example, the data flow may occur when plug-in **365** is invoked. In addition, communication may also occur between plug-in **365** and server **130**. For example, plug-in **365** may request alternate data from server **130** and server **130** may respond to the request. Further, plug-in **365** and printer **170-2** may communicate. For example, plug-in **365** may send the alternate data received from server **130** to printer **170-2** for printing.

[0042] In the map server example, in response to the request for higher resolution data from plug-in **365**, the map serer may send plug-in **365** higher resolution VML map data. In some embodiments, the data may be sent after verification of the digital signature provided by plug-in **365**. In some embodiments, the higher resolution map data may be encrypted prior to transmission. In one embodiment, upon receiving the higher resolution map data, plug-in **365** may decrypt and process the VML data, generate high resolution PDL data, and send the data to printer **170-2**. In another embodiment, plug-in **365** may simply pass the high resolution data to printer **170-2** and printer **170-2** may process the data prior to printing. If printer **170** is a network accessible printer, then the data may be sent to printer **170** over network **140**. In some embodiments, such as shown in FIG. **3**, where printer **170-2** is accessible through computer **110**, plug-in **365** may send the data to printer **170-2** using computer **110**. Printer **170-2** may use the data to print a high resolution map.

[0043] As noted above, in general, plug-in **365** may request alternate data associated with a URL wherein the alternate data is better suited to optimally use the capabilities of printer **170-2** when printed. For example, plug-in **365** may request data for a CMYK image that corresponds to a displayed RGB image, which has been selected for printing. The CMYK image data received from the application server may be sent to printer **170-2** for printing. As described above, the upstream request from plug-in **365** to server **130** can specify the particular map view desired, and include distinguishing flags to indicate the nature of the request to server **130**—such as a request for CMYK data.

[0044] As a further example, when browser **360** displays a web-page, data sent to browser **360** may use fonts supported

by browser **360**. When the user requests printing of displayed content for the web page, plug-in **365** may request alternate data from the web-page with fonts supported by printer **170-1** or **170-2**. The alternate data with fonts supported by printers **170** may be routed to the appropriate printer by plug-in **365** for printing.

[0045] In some embodiments, a program for conducting the processes described above can be recorded on computer-readable media **150** or computer-readable memory, These include, but are not limited to, Read Only Memory (ROM), Programmable Read Only Memory (PROM), Flash Memory, Non-Volatile Random Access Memory (NVRAM), or digital memory cards such as secure digital (SD) memory cards, Compact Flash™, Smart Media™, Memory Stick™, and the like. In some embodiments, one or more types of computer-readable media may be coupled to printer **170**.

[0046] Note that although the description above uses plug-in **365** and/or printers **170** to describe possible implementations, alternate implementations are envisaged. For example, the method could be implemented directly by browser **360**, where browser **360** is designed to support processing of the alternate data. Other embodiments of the present invention will be apparent to those skilled in the art from consideration of the specification and practice of one or more embodiments of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

What is claimed is:

1. A processor implemented method for printing data associated with a web page comprising the processor implemented steps of:

receiving a print request for a first print data associated with the web page, wherein the print request includes the URL of the web page;

generating a request for a second print data, wherein the request for the second print data is based on the URL of the web page, and the second print data is associated with the first print data; and

requesting a printer or a print engine to print according to the second print data received in response to the request for the second print data.

2. The processor implemented method of claim **1**, further comprising printing according to the first print data, if no data is received in response to the request for the second print data.

3. The processor implemented method of claim **1**, wherein the method is performed on a printer.

4. The processor implemented method of claim **3**, wherein the printer is a trusted client of the application server serving the web page.

5. The processor implemented method of claim **1**, wherein the receiving and generating steps are performed using a plug-in associated with a web browser and wherein the plug-in sends the second print data received in response to the request for second print data to the printer.

6. The processor implemented method of claim **5**, wherein the plug-in is a trusted client of the application server serving the web page.

7. The processor implemented method of claim **1**, wherein the second print data received in response to the request is encrypted.

8. The processor implemented method of claim **1**, wherein the first print data is low resolution map data and the second print data is higher resolution map data.

9. The processor implemented method of claim **1**, wherein the first print data is RGB image data and the second print data is CMYK image data.

10. The processor implemented method of claim **1**, wherein the first print data uses a font supported by a web-browser displaying content associated with the web-page and the second print data uses a font supported by a printer printing the content, wherein the font supported by the printer is different from the font supported by the browser.

11. The processor implemented method of claim **1**, wherein the method is performed on a print controller coupled to a printer.

12. A computer-readable medium that stores instructions, which when executed by a processor performs steps in a method for printing data associated with a web page comprising the processor implemented steps of:

receiving a print request for a first print data associated with the web page, wherein the print request includes the URL of the web page;

generating a request for a second print data, wherein the request for the second print data is based on the URL of the web page, and the second print data is associated with the first print data; and

requesting a printer or a print engine to print according to the second print data received in response to the request for the second print data.

13. The computer readable medium of claim **12**, wherein the method is performed on a printer.

14. The computer readable medium of claim **13**, wherein the printer is a trusted client of the application server serving the web page.

15. The computer readable medium of claim **12**, wherein the receiving and generating steps are performed using a plug-in associated with a web browser and wherein the plug-in sends the second print data received in response to the request for second print data to the printer.

16. The computer readable medium of claim **15**, wherein the plug-in is a trusted client of the application server serving the web page.

17. The computer readable medium of claim **12**, wherein the second print data is encrypted.

18. The computer readable medium of claim **12**, wherein the first print data is low resolution map data and the second print data is higher resolution map data.

19. The computer readable medium of claim **12**, wherein the first print data is RGB image data and the second print data is CMYK image data.

20. The computer readable medium of claim **12**, wherein the first print data uses a font supported by a web-browser displaying content associated with the web-page and the second print data uses a font supported by a printer printing the content, wherein the font supported by the printer is different from the font supported by the browser.

21. A computer-readable memory that stores instructions, which when executed by a processor performs steps in a method for printing data associated with a web page comprising the processor implemented steps of:

receiving a print request for a first print data associated with the web page, wherein the print request includes the URL of the web page;

generating a request for a second print data, wherein the request for the second print data is based on the URL of the web page, and the second print data is associated with the first print data; and

requesting a printer or a print engine to print according to the second print data received in response to the request for the second print data.

22. The computer readable medium of claim **21**, wherein the first print data is low resolution map data and the second print data is higher resolution map data.

23. The computer readable medium of claim **21**, wherein the first print data is RGB image data and the second print data is CMYK image data.

24. The computer readable memory of claim **21**, wherein the first print data uses a font supported by a web-browser displaying content associated with the web-page and the second print data uses a font supported by a printer printing the content, wherein the font supported by the printer is different from the font supported by the browser.

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