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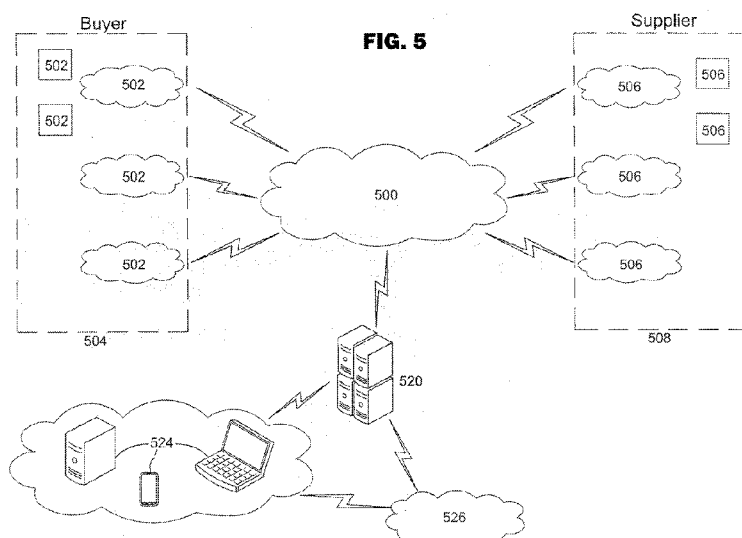
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(54) **Title:** SYSTEMS AND METHODS FOR MANAGING INTERCONNECTION AND SERVICE ASPECTS OF EXTERNAL
CONNECTIONS TO A CENTRAL NETWORK



(57) **Abstract:** A system for managing interconnection and service aspects amongst a plurality of external elements. According to a particular aspect, the system includes a server in communication with a central service network wherein the server hosts a portal application accessible to manage interconnection and service aspects amongst a plurality of external elements. The portal application has visibility of the edge connection points and connected external elements to determine interconnection and service aspects for one or more selected external elements.

**SYSTEMS AND METHODS FOR
MANAGING INTERCONNECTION AND SERVICE ASPECTS
OF EXTERNAL CONNECTIONS TO A CENTRAL NETWORK**

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Cross Reference

[0001] This international application claims priority to U.S. Patent Application No. 13/593,025 filed on August 23, 2012 entitled "SYSTEMS AND METHODS FOR MANAGING
10 INTERCONNECTION AND SERVICE ASPECTS OF EXTERNAL CONNECTIONS TO A CENTRAL NETWORK," which claims the benefit of U.S. Provisional Patent Application No. 61/593,723 filed on February 1, 2012, which are both incorporated by reference herein in their entireties.

Technical Field

15 [0002] This disclosure relates to the field of telecommunications, and more particularly to automation and management of interconnection and service aspects of external connections to a central network, such as, for example, automation and management via a portal application associated with the central network, which may comprise, for example, one or more Ethernet networks.

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Background

[0003] Establishing and managing connectivity between various network types and locations with existing systems and methods can be an arduous and cumbersome task, and has much inherent inefficiency. This is particularly true in utilizing an Ethernet network platform to facilitate management and connectivity across various disparate network types and platforms,
25 including, but not limited to, traditional telephony and service networks and installations. The

invention(s) described herein is/are directed but not limited to addressing problems associated with these existing systems and methods, and in a particular embodiment, a portal application is leveraged to address such problems. While portals that manage a single telecommunications network exist, no system exists that, for example, facilitates the automated management and connectivity across various disparate network types and platforms.

Summary

[0004] A system for managing interconnection and service aspects amongst a plurality of external elements is provided. According to a particular aspect, the system includes a server in communication with a central service network and hosting a portal application accessible to manage interconnection and service aspects amongst the plurality of external elements. By way of example, the external elements may be a corporate network, a service provider network, a carrier network, an application service server (e.g., a cloud computing service server, a videoconferencing service server, etc.), a device, a corporate end user location, or a multi-tenant location. The central service network includes a plurality of edge connection points in communication with each other and each either in communication with or capable of communicating with at least one of the plurality of external elements. The portal application has visibility of the edge connection points and connected external elements to determine interconnection and service aspects for one or more selected external elements. By way of example, the interconnection and service aspects may include the immediate identification of

connectability to the selected external elements, quality of service (QoS), service offerings, capabilities, connection type, or statistics for the selected external elements.

[0005] According to other aspects, the portal application provides to users, customers and potential subscribers the ability to manage the selection, connection and provisioning of services, such as application services or data or voice connection services, based on various criteria, such as the aforementioned aspects. The portal application also allows service and connection pricing to reflect these aspects. The portal application allows users and customers to define their offerings via various attributes, such as QoS, product or service offerings, service type, etc., which are visible to others who may be seeking services or connections. According to various aspects, the portal application is capable of facilitating selling, leasing, establishing, managing, auditing, quantifying, and analyzing connectivity and associated relationships between users, networks and service providers.

[0006] These and other aspects will become readily apparent from the written specification, drawings, and claims provided herein.

15 **Brief Description of Drawings**

[0007] **FIG. 1** is a schematic diagram of an exemplary system framework for purposes of illustrating one or more aspects described herein.

[0008] **FIG. 2** is a schematic diagram of an exemplary central network connection configuration between a plurality of network edge locations for purposes of illustrating one or more aspects described herein.

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[0009] **FIGS. 3A-3D** are schematic diagrams illustrating exemplary edge location configurations according to one or more aspects described herein.

[0010] **FIG. 4** is a schematic diagram of an exemplary network configuration in connection with application services for purposes of illustrating one or more aspects described herein.

5 [0011] **FIG. 5** is a schematic diagram of an exemplary embodiment for use of the central network in accordance with one or more aspects described herein.

[0012] **FIGS. 6A-6I** are exemplary illustrations of screenshots associated with an exemplary embodiment of a portal in accordance with one or more aspects described herein.

[0013] **FIG. 7** is a flowchart of an exemplary process according to one or more aspects
10 described herein.

Detailed Description of Exemplary Embodiments

[0014] The description that follows describes, illustrates and exemplifies one or more particular embodiments of the invention(s) in accordance with its principles. This description is not provided to limit the invention(s) to the embodiments described herein, but rather to explain
15 and teach the principles of the invention(s) in such a way to enable one of ordinary skill in the art to understand these principles and, with that understanding, be able to apply them to practice not only the embodiments described herein, but also other embodiments that may come to mind in accordance with these principles. The scope of the invention(s) is intended to cover all such embodiments that may fall within the scope of the appended claims, either literally or under the
20 doctrine of equivalents.

[0015] It should be noted that in the description and drawings, like or substantially similar elements may be labeled with the same reference numerals. However, sometimes these elements may be labeled with differing numbers, such as, for example, in cases where such labeling facilitates a more clear description. Additionally, the drawings set forth herein are not necessarily drawn to scale, and in some instances proportions may have been exaggerated to more clearly depict certain features. Such labeling and drawing practices do not necessarily implicate an underlying substantive purpose. As stated above, the present specification is intended to be taken as a whole and interpreted in accordance with the principles of the invention(s) as taught herein and understood to one of ordinary skill in the art.

[0016] With respect to the exemplary systems, components and architecture described and illustrated herein, it should also be understood that the invention(s) may be embodied by, or employed in, numerous configurations and components, including one or more system, hardware, software, or firmware configurations or components, or any combination thereof, as understood by one of ordinary skill in the art. Accordingly, while the drawings illustrate exemplary systems including components for one or more of the embodiments contemplated herein, it should be understood that with respect to each embodiment, one or more components may not be present or necessary in the system. Accordingly, the invention(s) should not be construed as limited by the exemplary embodiments described herein or any of the associated didactic schematics.

[0017] FIG. 1 is a high-level schematic diagram illustrating an exemplary system framework within which one or more principles of the invention(s) may be employed. The system

framework 100 includes a central service network 102 including a plurality of edge connection points 104 in communication with each other via the network and each either in communication with or capable of communicating with at least one of a plurality of external elements, which may include, for example, a corporate end user location 106, a telecommunications carrier 108
5 serving end users 108a, a service provider 110 serving end users 110a, a corporate network 112 serving end users 112a, application services 114, devices 116, or a multi-tenant location 118. It is contemplated that any type of service, network, device, application, or other functionality to which a user of a network may seek connection to, or control or use thereof, can be incorporated into the framework 100. As will be described in more detail below, aspects of the systems and
10 methods can be used for managing interconnection and service aspects amongst a plurality of external elements, such as the exemplary external elements described above. However, further description of the exemplary framework 100 and exemplary architecture will be helpful in understanding these aspects.

[0018] FIG. 2 illustrates exemplary connectivity and transport between edge locations 202
15 within a central service network, such as central service network 102. As shown in FIG. 2, connectivity between each of the edge locations 202 may be via direct transport to one or more of the other edge locations 202, or it may also involve connection through one or more networks such as a third-party network 204 or a public network 206, such as the Internet. Each of these edge locations 202 connects to and communicates with an external element, such as, for
20 example, any of the elements described above. Thus, by way of example, and in furtherance of one or more aspects of the subject systems and methods, the central service network facilitates connections, such as a data or telecommunications service connection, that a user may desire to a

particular location outside the user's existing system or network. As will become apparent from further description herein, it is contemplated that when connectivity is established for such a user, that user's existing system or network will become part of the central service network's capability and reach through, for example, E-NNIs (external network-to-network interfaces), and will be visible to other users who may desire connectivity to that particular user's system or network.

[0019] For further context of exemplary architecture with respect to the edge locations, FIGS. 3A – 3D illustrate various edge location configurations that may be employed to provide connectivity to external elements with the understanding that any number of configurations known in the art may be employed. As shown in FIG. 3A, an edge location may be configured as a single edge switch/router device, wherein the edge switch/router device is in communication with the central service network and is capable of or in communication with one or more external elements, thereby providing external connections for the benefit of the users of the central service network. As shown in FIG. 3B, an edge location may be configured with two or more edge switches/router devices primarily for redundancy. In this configuration, each edge switch/router device is in communication with the central service network and is capable of or in communication with one or more external elements. The edge switches/router devices are also in communication with each other. As shown in FIG. 3C, an edge location may be configured with a core router device separate from and in communication with an edge switch device. As shown in FIG. 3D, an edge location may be configured with a core router device separate from and in communication with two or more edge switch devices for redundancy. In a particular implementation, the central service network is an Ethernet network which employs one or more

Ethernet switches, which is preferably a multi-port switch module or an array of modules. The Ethernet switch may be, merely by way of example, one or more components from the 6500 Catalyst Series from Cisco Systems, Inc., which may include one or more supervisors, chassis configurations, modules, PC cards, as well as operating system software.

5 **[0020]** As previously mentioned, the central service network may provide connectivity to any number of external elements, including a plurality of application services. Such connectivity may be employed in any number of ways as known in the art. As shown in FIG. 4, one or more application services may be accessible to a user via one or more edge location connections. Furthermore, one or more application services may be accessible within the central service
10 network and connectable via a router/switch within the network. It is contemplated that one or more application services may be hosted by the central service network for the benefit of network users.

[0021] As previously mentioned, according to a particular aspect, a system for managing interconnection and service aspects amongst a plurality of external elements in communication
15 or capable of communication with the central service network is contemplated. The system includes the aforementioned central service network, which includes a plurality of edge connection points in communication with each other and each either in communication with or capable of communicating with at least one of the plurality of external elements. The system further includes a server in communication with the central service network, which hosts a portal
20 application accessible to manage interconnection and service aspects amongst the plurality of external elements. In an embodiment, the portal application has visibility of the edge connection

points and connected external elements to determine interconnection and service aspects for one or more selected external elements. By way of example, the manageability of interconnection and service aspects may include the immediate identification of connectability to the selected external elements, quality of service (QoS), service offerings, capabilities, connection type, or
5 statistics for the selected external elements.

[0022] In an embodiment, the portal application (a) allows at least one client or user to access information relating to connectability and service characteristics of the plurality of external elements, (b) has visibility of the edge connection points and connected external elements to determine connectability between the plurality of external elements, and (c) allows
10 the at least one client or user to request connection to a selected one or more of the plurality of external elements.

[0023] FIG. 5 illustrates an embodiment for purposes of exemplifying one or more of the aforementioned management aspects. Referring to FIG. 5, a central service network 500 provides capability to connect elements 502 of a first network 504 (which may include one or
15 more other networks) and one or more elements 506 of a second network 508 (which may also include one or more other networks). In an exemplary application, one or more elements 502 of the network 504 may be associated with buyers of network connectivity and one or more elements 506 of the network 508 may be associated with suppliers or sellers of network connectivity. A buyer associated with one or more clients or networks within the network 504
20 may desire to obtain a connection with one or more networks or clients within the network 508. A supplier associated with one or more networks or clients within the plurality of networks may

be willing to supply the desired access. According to a particular aspect, a service provider associated with the central service network may provide connectivity service to facilitate connectivity transactions and management between the buyer and the supplier.

[0024] Referring again to FIG. 5, a system, computer or server 520 provides a portal application associated with, or capable of communicating with, the central service network. The portal application provides functionality in connection with the connectivity, relationships and behaviors between the buyer and the supplier. The buyer may access the portal via a client device 524, such as a computer, or over a network 526, such as the Internet. It should be noted that while a portal application operating on a server is described herein, other implementations to provide such functionality are possible and considered within the scope of this aspect.

[0025] While depicted schematically as a single server, computer or system, it should be understood that the term “server” as used herein and as depicted schematically herein may represent more than one server or computer within a single system or across a plurality of systems, or other types of processor based computers or systems. The server 520 includes at least one processor, which is a hardware device for executing software/code, particularly software stored in a memory or stored in or carried by any other computer readable medium. The processor can be any custom made or commercially available processor, a central processing unit (CPU), an auxiliary processor among several processors associated with the server 520, a semiconductor based microprocessor (in the form of a microchip or chip set), another type of microprocessor, or generally any device for executing software code/instructions. The processor may also represent a distributed processing architecture.

[0026] The server operates with associated memory and can include any one or a combination of volatile memory elements (e.g., random access memory (RAM, such as DRAM, SRAM, SDRAM, etc.)) and nonvolatile memory elements (e.g., ROM, hard drive, tape, CDROM, etc.). Moreover, memory may incorporate electronic, magnetic, optical, and/or other types of storage media. Memory can have a distributed architecture where various components are situated remote from one another, but are still accessed by the processor.

[0027] The software in memory or any other computer readable medium may include one or more separate programs. The separate programs comprise ordered listings of executable instructions or code, which may include one or more code segments or portions, for implementing logical functions. In the exemplary embodiments herein, a server application or other application runs on a suitable operating system (O/S). The operating system essentially controls the execution of the portal application, or any other computer programs of server 520, and provides scheduling, input-output control, file and data management, memory management, and communication control and related services.

[0028] In the context of this document, a “computer-readable medium” may be any means that can store, communicate, propagate, or transport data objects for use by or in connection with the server 520 or any other system component. The computer readable medium may be for example, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, propagation medium, or any other device with similar functionality. More specific examples (a non-exhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a random access

memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM, EEPROM, or Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which
5 the program is printed, as the program can be electronically captured, via, for instance, optical scanning of the paper or other medium, then compiled, interpreted or otherwise processed in a suitable manner if necessary, and stored in a computer memory. The software and/or other functional aspects of the portal application or system can be embodied in any type of computer-readable medium for use by or in connection with an instruction execution system or apparatus,
10 such as a computer, such as the server 520.

[0029] The portal concept can be used to facilitate all aspects of functionality related to the central service network, including providing users, customers and potential subscribers the ability to manage the selection, connection and provisioning of services, such as application services or data or voice connection services, based on various criteria, such as connectability to
15 selected external elements, quality of service (QoS), service offerings, connection type, or statistics for the selected external elements. The portal application also allows service and connection pricing to reflect these aspects. Furthermore, the portal application allows users and customers to define their offerings via various attributes, such as QoS, product or service offerings, service type, etc., which are visible to others who may be seeking services or
20 connections. The portal application provides a platform for facilitating selling, leasing, establishing, managing, auditing, quantifying, and analyzing connectivity and associated relationships between users, networks and service providers. The portal application has

visibility of the edge connection points and connected external elements to determine interconnection and service aspects for one or more selected external elements.

[0030] According to a particular aspect, the portal is useful in providing functionality for managing connectivity, relationships and behaviors between buyers and supplier network(s).

5 Such functionality can be implemented via one or more server applications or other software associated with the server 520. According to a particular aspect, the portal may provide a buyer with functionality relating to placing an order for one or more connections and checking availability of connections. For example, the buyer may be able to check for lists of suppliers, capacity of suppliers, types of service, and lead time to implement connections. As part of the
10 service, it is contemplated that users of the portal may be able to (1) manage orders between buyers and suppliers; (2) manage and simplify Letters of Authorization (LOA) and Connecting Facility Assignment (CFA), and manage intercarrier trust levels; and (3) manage various aspects of the service.

[0031] Management of orders may include managing capacity, notifying suppliers of
15 connectivity and relationships, confirmations of connectivity and relationships, and providing Design Layout Records (DLR), which represents the detailed design path of a completed telecommunications circuit, including all facilities from one end of the circuit to the other end.

[0032] The portal provides simplification of the LOA process. An LOA is a document that indicates if a Carrier or CLEC/Reseller is acting as an end user's agent. This Authorization needs
20 to be kept on file with the Carrier or CLEC/Reseller. The portal functionality can automate one or more aspects of the LOA process and management.

[0033] According to another aspect, the portal can be used to automate the Connecting Facility Assignment (CFA). For example, assignment can be automatic based on one or more algorithms, such as, for example, matching characteristics of buyer service or network to supplier service or network. The automation may also include management of mapping configurations for channels/connections.

[0034] According to another aspect, the portal can be used to facilitate management of service by a user, such as, for example, management of configuration changes and reporting regarding service, billing, ordering status, inventory, and performance metrics. With respect to performance metrics, a user can check and manage service or network stats, relating to either the switch service provider portion or end to end from buyer to supplier.

[0035] FIGS. 6A - 6I are a collective set of exemplary screenshots of an embodiment of the portal GUI. Referring generally to FIG. 6A, a customer of connectivity services can access the portal and is presented with a plurality of options and functions in general user interface screen 600 in accordance with the aforementioned aspects of the portal and associated system and methods. As shown in FIG. 6A, a customer may be presented with a plurality of portal options 602 along the left-hand side of the screen. FIG. 6A illustrates an exemplary "dashboard" option 604, which provides functionality for customers to start a new quote request for a new order at 606, view and manage all customer requests based on status at 608, view and respond to feedback requests at 610, and access product information at 612.

[0036] When a customer elects to start a new quote request at 606, they may be presented with a first associated screen to create a quote request as exemplified in FIG. 6B. The customer

may be presented with various data fields associated with the request, such as, for example, request status, service configuration, site information, bandwidth requested, interface type VLAN requirements, and any other information needed or desired in connection with fulfilling the service request. In the illustrated example, Site 1 is the hub of a three site connection configuration which is being requested in this example and will be illustrated in the remaining screenshots of FIGS. 6C – 6I. An optional map function may be provided to assist with determining site locations.

[0037] As the customer progresses through the request as illustrated in FIGS. 6A – 6E, they can enter information relating to the remaining sites and other service-related information. In this example, information relating to three sites is entered, with functional options, for example, to edit or add additional information. The customer may be presented with additional queries for information relating to the desired connectivity configuration amongst the sites. When the information for the request is entered, the customer may submit the request, which is processed by the system to generate a quote for the requested service connectivity configuration and which, in an embodiment, results in a quote response summary such as that illustrated in FIG. 6F. The customer may then elect to proceed with creating the order, upon which the customer may be presented with the screens illustrated in FIGS. 6G and 6H. Upon submission of an order, the customer may be presented with an order summary screen, such as the exemplary screen illustrated in FIG. 6I.

[0038] FIG. 7 is a flowchart of a method for an electronic device (such as the system, computer or server 520 as discussed with respect to FIG. 5) to facilitate a provisioning of various

network connections. More particularly, the method relates to brokering a provisioning request between a buyer and a supplier.

[0039] The method begins with the electronic device receiving 705, from a first entity of a plurality of entities, a request for provisioning at least one of a plurality of network connections.

5 According to aspects, the first entity can be a buyer and the request can include an identification of at least one of a connection type, a service offering, or a quality of service (QoS). The electronic device identifies 710 an available portion of the plurality of network connections that matches the request. For example, the available portion can have a capability that matches a desired capability indicated by the request. The electronic device determines 715 whether to
10 auction the available portion. Particularly, the electronic device can determine to auction the available portion if there is not an available supplier to fulfill the request.

[0040] If the electronic device determines not to auction the available portion ("NO"), for example if a supplier is already associated with the available portion, the processing can proceed to 730. In contrast, if the electronic device determines to auction the available portion ("YES"),
15 the electronic device provides 820 an identification of the available portion to a second entity. For example, the electronic device can list specifications associated with the available portion. The electronic device receives 725, from the second entity, an offer to provide a service matching the request via the available portion.

[0041] The electronic device provides 730 an indication of the available portion of the
20 network connections to the first entity. The electronic device determines 735 if a selection of the available portion is received. Particularly, the electronic device determines whether the first

entity has selected to proceed with the provisioning. If the selection is received ("YES"), the electronic device provisions 740 the available portion in response to receiving the selection. The provisioning is facilitated according to the request and based on any agreements between the buyer and the supplier.

- 5 [0042] While one or more specific embodiments have been illustrated and described in connection with the invention(s), it is understood that the invention(s) should not be limited to any single embodiment, but rather construed in breadth and scope in accordance with recitation of the appended claims.

Claims

What is claimed is:

1. A system for managing interconnection and service aspects amongst a plurality of external elements, the system comprising:

5 a central service network comprising a plurality of edge connection points either in communication or capable of communicating with each other and each either in communication with or capable of communicating with at least one of the plurality of external elements; and

a server in communication with the central service network and hosting a portal application accessible to manage interconnection and service aspects amongst the plurality of
10 external elements, the portal application having visibility of the edge connection points and connected external elements to determine interconnection and service aspects for a selected at least one of the plurality of external elements.

2. The system of claim 1, wherein each of the plurality of external elements is selected from
15 the group consisting of a corporate network, a service provider network, a carrier network, an application service server, a device, a corporate end user location, or a multi-tenant location.

3. The system of claim 1, wherein the determination of interconnection and service aspects comprises immediate identification of connectability to the selected at least one of the plurality
20 of external elements.

4. The system of claim 1, wherein the determination of interconnection and service aspects comprises immediate identification of capability of the selected at least one of the plurality of external elements.

5 5. The system of claim 1, wherein the determination of manageability of interconnection and service aspects comprises identification of quality of service (QoS) for the selected at least one of the plurality of external elements.

6. The system of claim 1, wherein the determination of manageability of interconnection
10 and service aspects comprises identification of service offerings for the selected at least one of the plurality of external elements.

7. The system of claim 1, wherein the determination of manageability of interconnection and service aspects comprises identification of connection type for the selected at least one of the
15 plurality of external elements.

8. The system of claim 1, wherein the determination of manageability of interconnection and service aspects comprises identification of performance statistics for the selected at least one of the plurality of external elements.

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9. The system of claim 1, wherein the server hosting the portal is within the central service network.

10. The system of claim 1, the central service network further comprising an element manager in communication with each of the plurality of edge connections and the server hosting the portal application.

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11. The system of claim 1, the central service network further comprising at least one server in communication with at least one of the plurality of edge connections and hosting a service application.

10 12. The system of claim 1, the central service network further comprising at least one router or switch device in communication with at least one edge connection and a server in communication with either one of the switch device or the router and hosting a service application.

15 13. The system of claim 1, wherein at least one edge connection point comprises an edge switch router device capable of communicating with the at least one of the plurality of external elements.

20 14. The system of claim 1, wherein at least one edge connection point comprises a pair of edge switch routing devices connected to each other for redundancy and each capable of communicating with the at least one of the plurality of external elements.

15. The system of claim 1, wherein at least one edge connection point comprises an edge switch device connected to a router device, the edge switch device capable of communicating with the at least one of the plurality of external elements.

5 16. The system of claim 1, wherein at least one edge connection point comprises a pair of edge switch routing devices connected to each other for redundancy and each connected to a router device, each of the edge switch routing devices capable of communicating with the at least one of the plurality of external elements.

10 17. The system of claim 1, wherein the plurality of edge connection points are in communication with each other via a connection mode selected from the group consisting of a direct transport, a public network, and a third party network connection service.

18. The system of claim 17, wherein the direct transport comprises a fiber connection.

15 19. The system of claim 17, wherein the direct transport comprises an Ethernet connection.

20. The system of claim 17, wherein the public network comprises the Internet.

20 21. The system of claim 17, wherein the public network comprises a VPN across the Internet.

22. The system of claim 16, wherein the third party network service comprises an MPLS service.

23. A computer program product stored on a non-transitory computer-readable medium, the
5 computer program product having computer-executable code instructions which are executable on a computer server to manage interconnection and service aspects amongst a plurality of external elements either connected or connectable to a central service network comprising a plurality of edge connection points either in communication with or capable of communicating with each other and each either in communication with or capable of communicating with at
10 least one of the plurality of external elements, the computer-executable code instructions comprising:

first code instructions for receiving a request from a client for connection between one of the plurality of external elements and at least one of the other of the plurality of external elements;

15 second code instructions for determining connectability to the at least one of the other of the plurality of external elements by checking visibility of the edge connection points and connected external elements; and

third code instructions for establishing the connection if the at least one of the other of the plurality of external elements is either connected or connectable based on checking visibility of
20 the edge connection points and connected external elements.

24. The computer program product of claim 23, further comprising:

fourth code instructions for identifying to the client quality of service (QoS) of the at least one of the other of the plurality of external elements.

5 25. The computer program product of claim 23, further comprising:

fourth code instructions for identifying to the client service offerings for the at least one of the other of the plurality of external elements.

10 26. The computer program product of claim 23, further comprising:

fourth code instructions for identifying connection type for the at least one of the other of the plurality of external elements.

15 27. The computer program product of claim 23, further comprising:

fourth code instructions for identifying statistics for the at least one of the other of the plurality of external elements.

20 28. A system for managing interconnection and service aspects amongst a plurality of external elements, the system comprising:

a central service network comprising a plurality of edge connection points in communication with or capable of communicating with each other and each either in communication with or capable of communicating with at least one of the plurality of external elements; and

5 a server in communication with the central service network and hosting a portal application accessible by at least one client to manage interconnection and service aspects amongst the plurality of external elements, the portal application (a) allowing the at least one client to access information relating to connectability and service characteristics of the plurality of external elements, (b) having visibility of the edge connection points and connected external
10 elements to determine connectability between the plurality of external elements, and (c) allowing the at least one client to request connection to a selected one or more of the plurality of external elements.

29. The system of claim 28, wherein each of the plurality of external elements is selected
15 from the group consisting of a corporate network, a service provider network, a carrier network, an application service server, a device, a corporate end user location, or a multi-tenant location.

30. The system of claim 28, wherein the plurality of edge connection points are in communication with each other via a connection mode selected from the group consisting of a
20 direct transport, a public network, and a third party network connection service.

31. The system of claim 28, wherein the service characteristics of the plurality of external elements comprise price of service.

32. The system of claim 28, wherein the service characteristics of the plurality of external
5 elements comprise quality of service (QoS).

33. The system of claim 28, wherein the service characteristics of the plurality of external elements comprise performance metrics.

10 34. The system of claim 33, wherein the performance metrics comprise latency.

35. The system of claim 33, wherein the performance characteristics comprise dropped packet statistics.

15 36. A system for managing service configurations among a plurality of entities, the system comprising:

a central service network comprising network connections accessible by the plurality of entities; and

a server in communication with or capable of communicating with the central service
20 network and hosting a portal application configured to:

receive, from a first entity of the plurality of entities, a request for provisioning at least one of the network connections,

identify an available portion of the network connections that matches the request,
and

provision the available portion of the network connections according to the
request.

5

37. The system of claim 36, wherein the portal application is further configured to:

receive, from a second entity of the plurality of entities, an offer to provide a service via
an additional portion of the network connections.

10 38. The system of claim 36, wherein the request indicates a desired capability, and wherein
the identifying the available portion of the network connections that matches the request
comprises:

identifying the available portion having a capability that matches the desired capability.

15 39. The system of claim 36 wherein the provisioning the available portion of the network
connections according to the request comprises:

provide an indication of the available portion of the network connections to the first
entity,

20 receive, from the first entity, a selection of the available portion of the network
connections, and

provisioning the available portion in response to the receiving the selection.

40. The system of claim 36, wherein the request comprises an identification of at least one of a connection type, a service offering, or a quality of service (QoS) .

41. The system of claim 40, wherein the provisioning the available portion of the network
5 connections according to the request comprises:

provisioning the available portion according to the at least one of the connection type, the service offering, or the quality of service (QoS).

42. The system of claim 36, wherein the identifying the available portion of the network
10 connections that matches the request comprises: (reverse auction)

identifying the available portion that fulfills a capability specified by the request,

providing an identification of the available portion to a second entity, and

receiving, from the second entity, an offer to provide a service matching the request via the available portion.

15
43. The system of claim 36, where the provisioning the available portion of the network connections according to the request comprises:

activating the available portion for use by the first entity of a service of a second entity.

20 44. The system of claim 36, wherein the identifying the available portion of the network connections that matches the request comprises:

identifying a lead time needed to implement connectivity to the available portion, and

providing an indication of the lead time to the first entity.

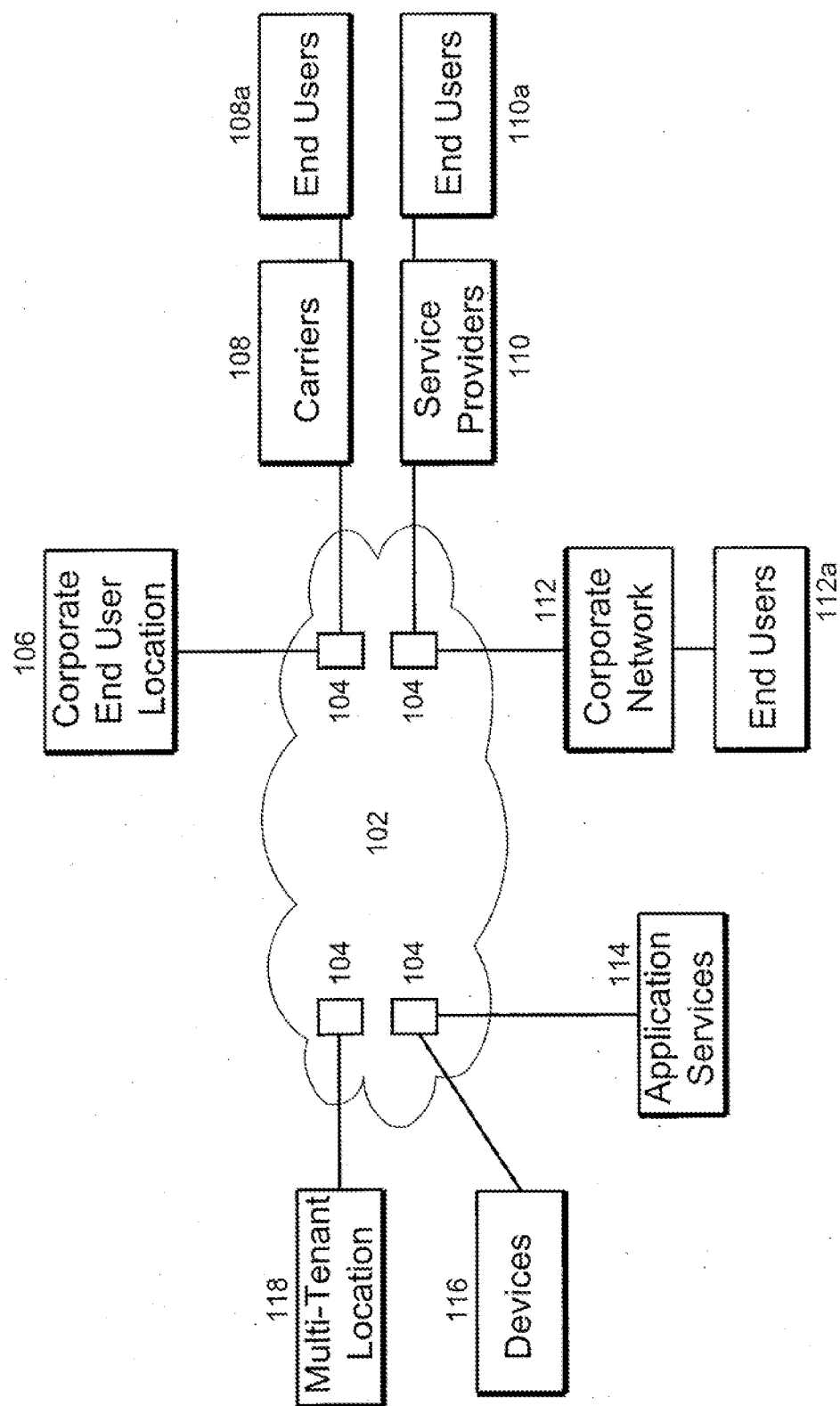
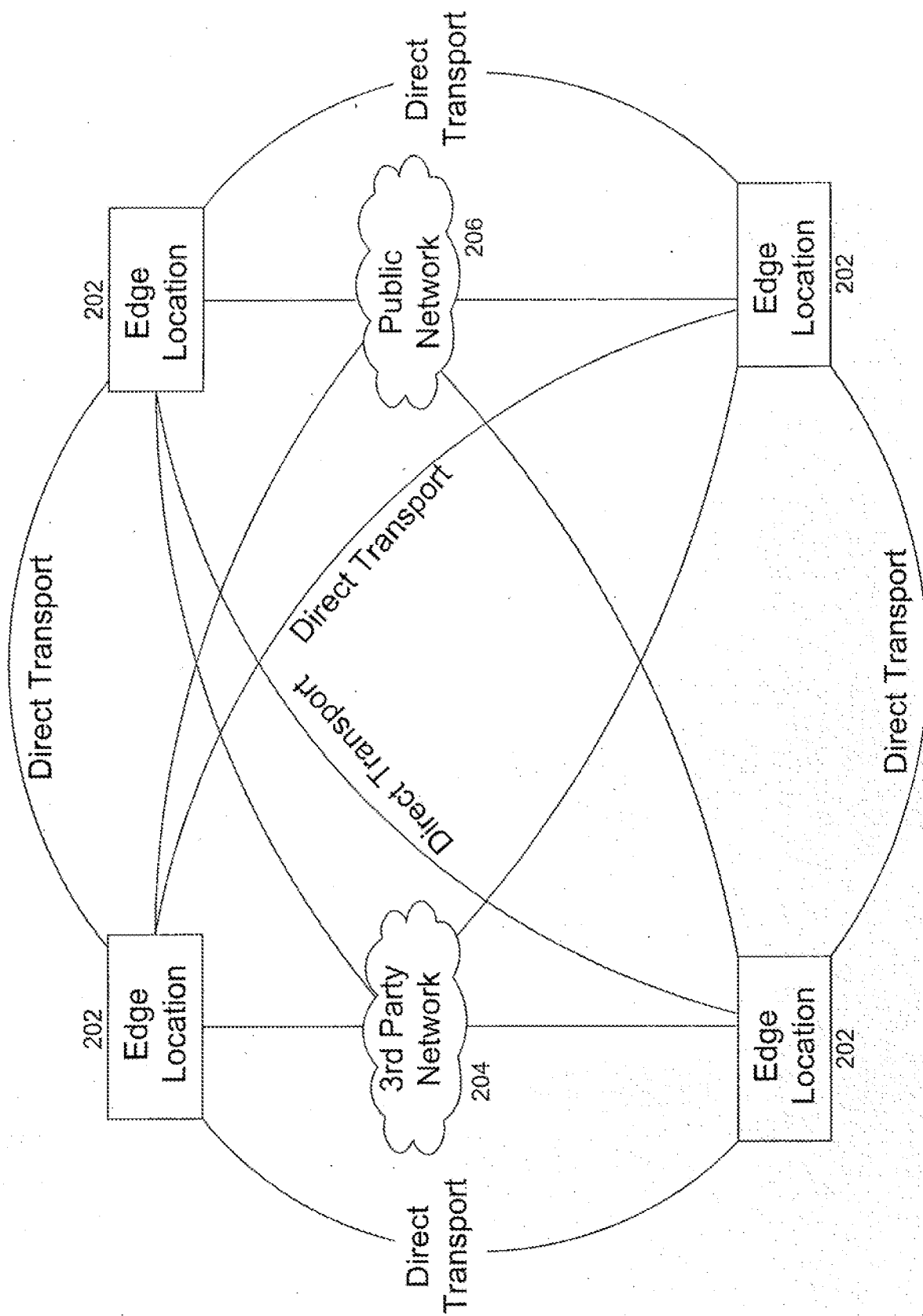
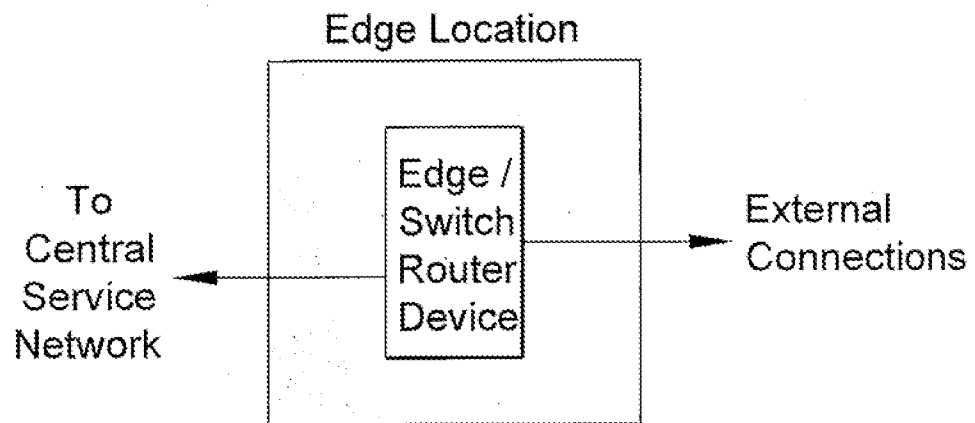
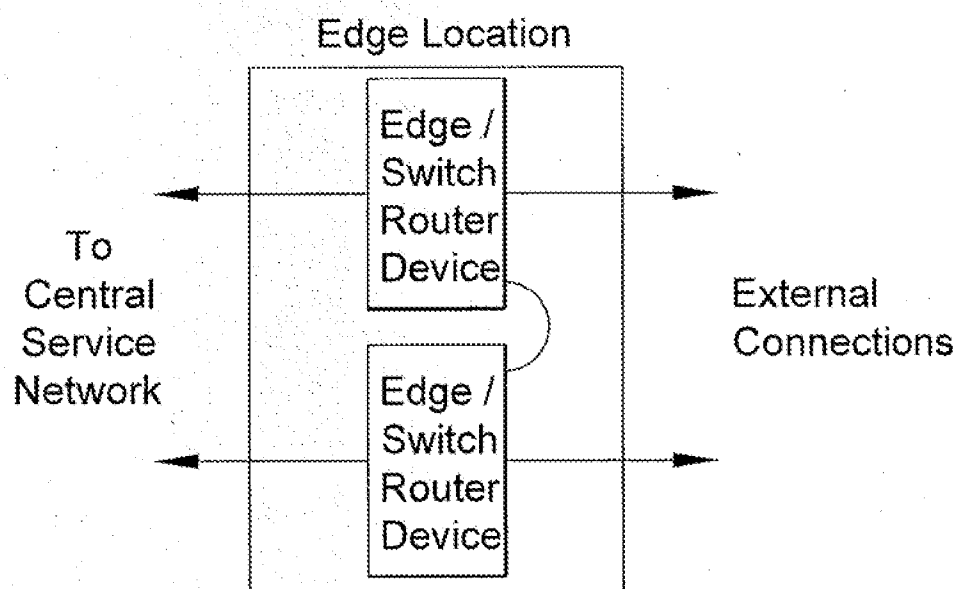
FIG. 1

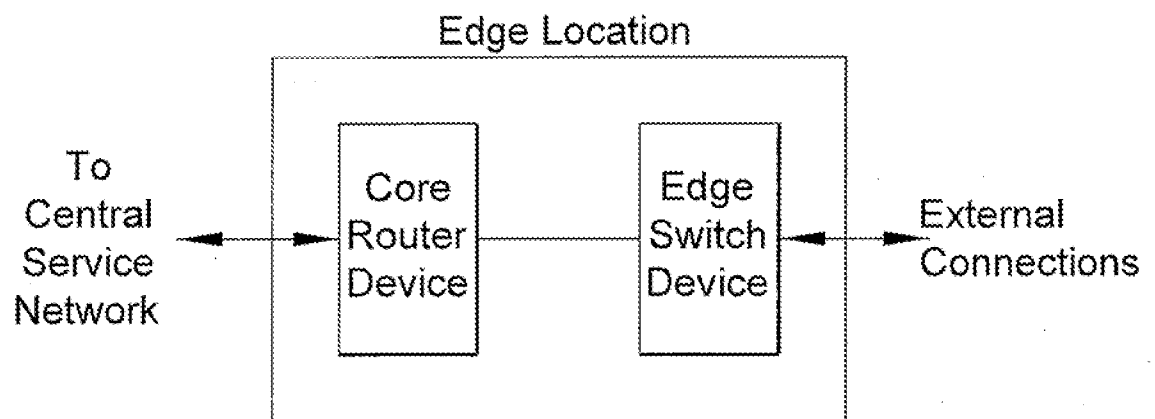
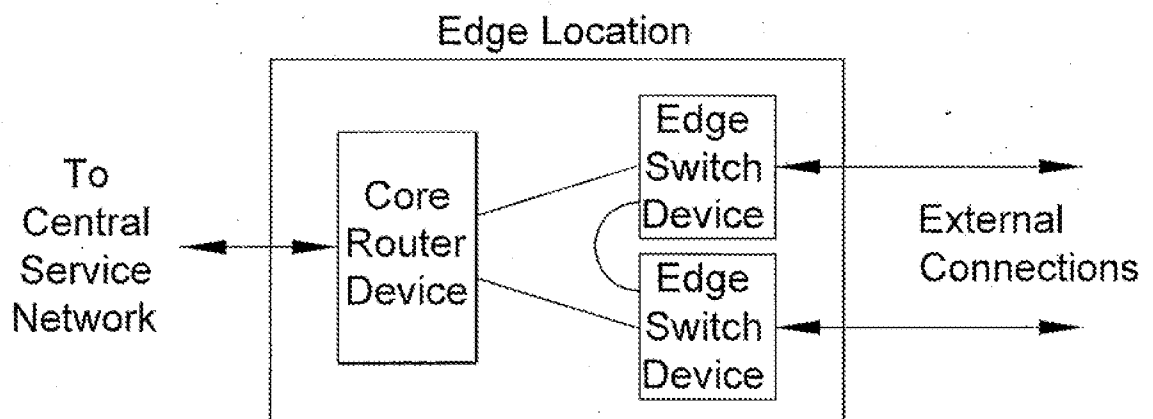
FIG. 2



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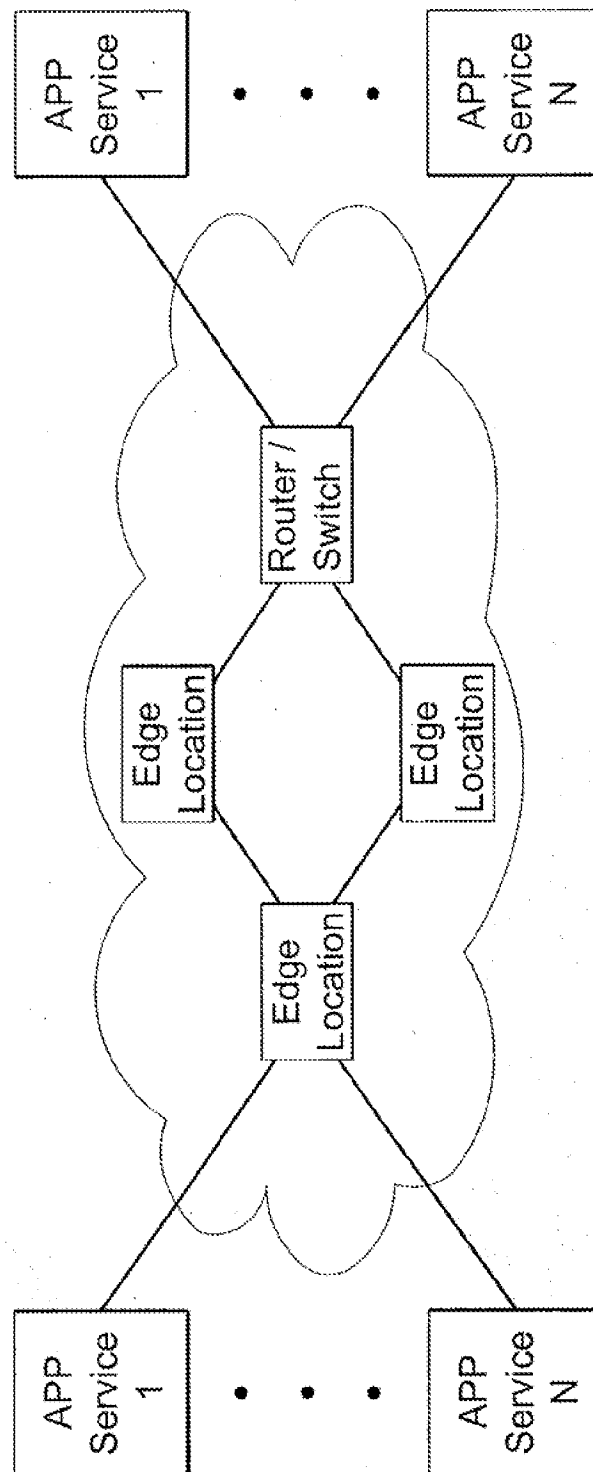
FIG. 3A**FIG. 3B**

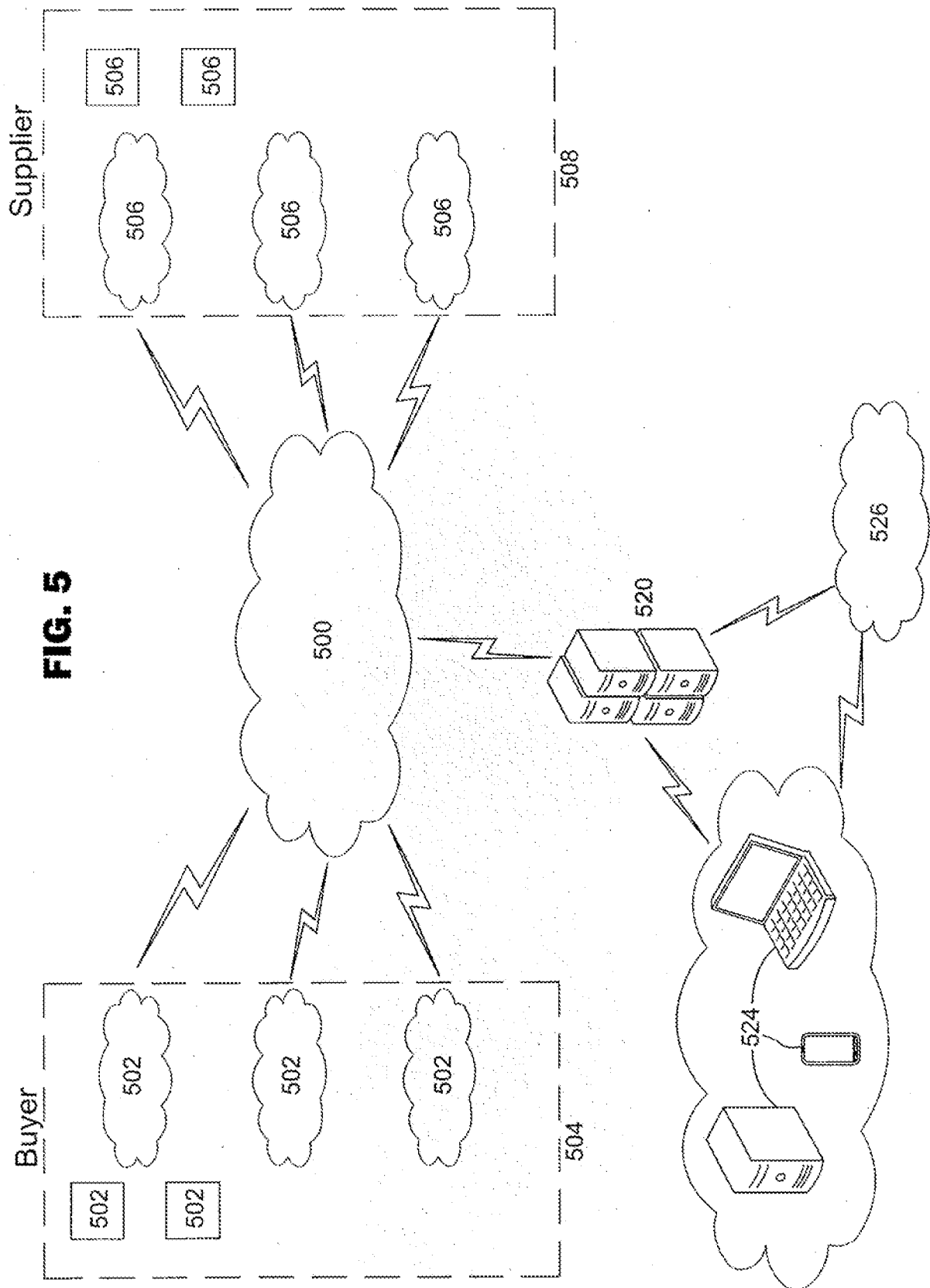
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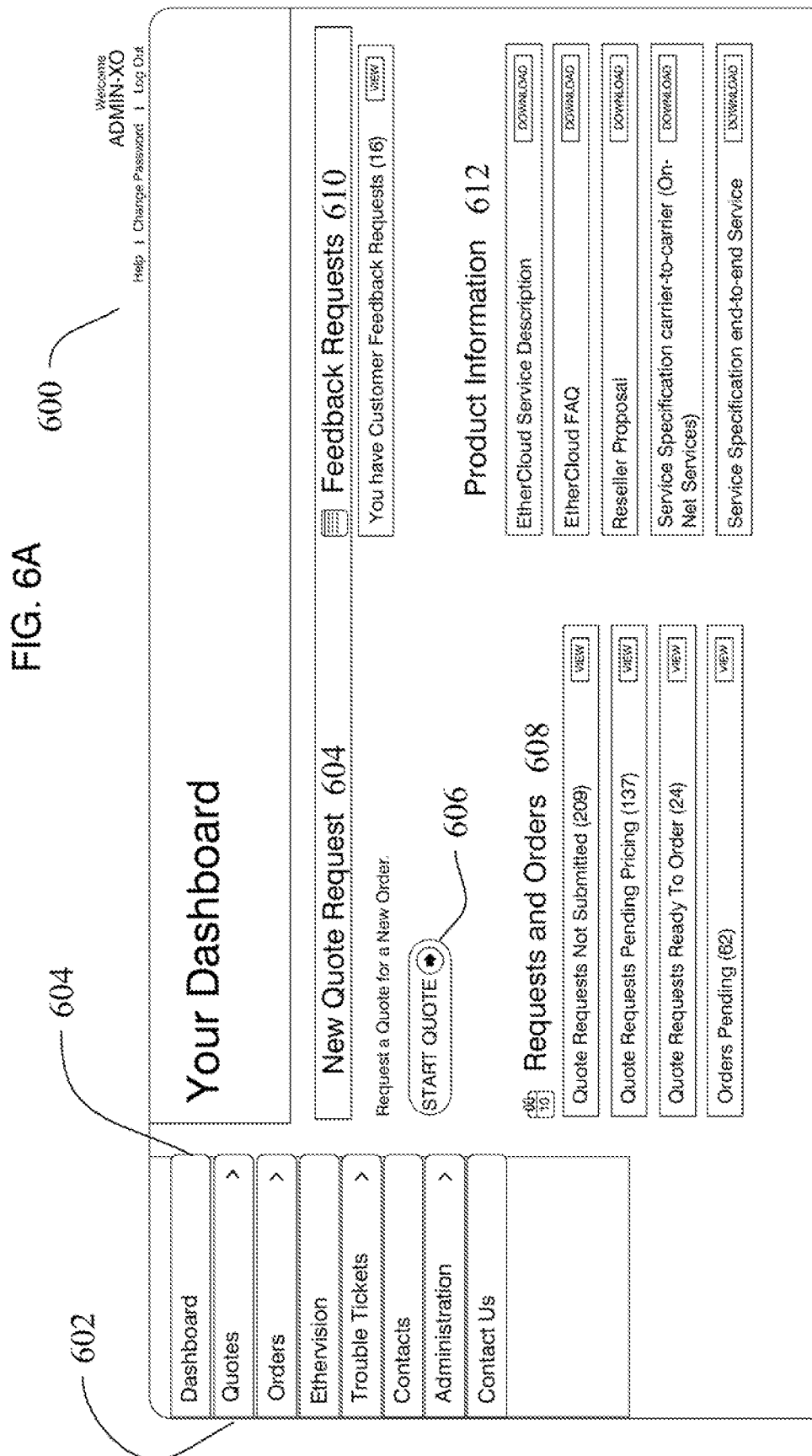
FIG. 3C**FIG. 3D**

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FIG. 4







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FIG. 6B

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Trouble Tickets ➤

Contacts

Administration ➤

Contact Us

Create Quote Request

Quote Request Information +

REQUEST STATUS Open

Service Information +

SERVICE CONFIGURATION Point to Multipoint Ethernet

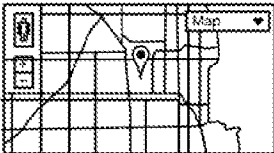
NUMBER OF SITES 2

Site Information

Site 1-Hub +

RNN SITE New York 70 BROAD STREET
3RD FLOOR, MANHATTAN, NY
10004

Site 2



SITE TYPE Address

SITE NAME

ADDRESS United States of America

Country USA

W. Adams St Chicago

Street City

Illinois Robert

State/Province Postal Code

Validate Address

Please select an address

☒ 550 W. Adams St, Chicago, Illinois 60601 United States of America
☐ Use Address As Entered: 550 Adams Chicago, Illinois 60601 United States of America

BANDWIDTH REQUIREMENTS 10 Mbps

SFC TARGET PRICE USD (12 Month Contract Term)

INTERFACE TYPE FullEthernet - CAT5 - RJ45

PLAN REQUIREMENTS Tagged 802.1q Ethernet SmartLink

DIVERSITY / REDUNDANCY REQUIREMENTS

LOCAL PHONE NUMBER

Area Ext

For better service, please provide a local contact phone number

*Required

CANCEL ✕

Next ➤

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FIG. 6C

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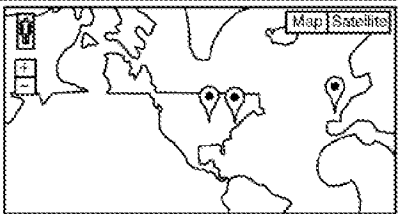
Quote Request Information Edit +

REQUEST STATUS

Service Information Edit +

SERVICE CONFIGURATION NUMBER OF SITES

Site Information



Site 1-Hub Edit +

ENVI SITE

Site 2 Edit +

ADDRESS BANDWIDTH REQUESTED

Site 3 Edit +

POP SITE BANDWIDTH REQUESTED

CANCEL X SUBMIT +

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FIG. 6D

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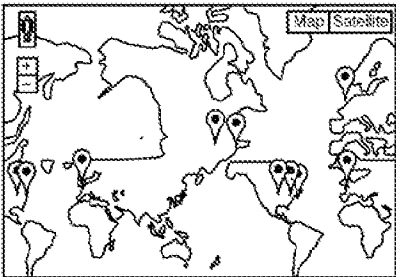
Create Quote Request

Quote Request Information Edit

REQUEST NAME	Network 1	REQUEST ID	402317
TARGET IN-SERVICE DATE	30-Mar-2012	REQUEST STATUS	Open
CURRENCY FOR QUOTED PRICE	USD	CREATED BY	Administrator, NT Portal K Sr.
CONTRACT TERM	12/ 24 months	CREATED DATE	27-Jan-2012

Service Information Edit

SERVICE CONFIGURATION	Point to Multipoint Ethernet	NUMBER OF SITES	3
		MTU SIZE	1500 Bytes

Site Information


Site 1-Hub Edit

POP SITE	New York 12 BROAD STREET, 8RD FLOOR, MANHATTAN, NY 10004
SITE NAME	

Site 2 Edit

ADDRESS	300 W Adams St, Chicago, Illinois 60661 United States of America	SELECTED SUPPLIERS	Tinet SpA
BANDWIDTH REQUESTED	10 Mbps	MCR TARGET PRICE	0.00 USD
SITE NAME		INTERFACE TYPE	FastEthernet + CAT5 + RJ45
		VLAN REQUIREMENTS	Tagged 802.1q Ethernet interface
		DIVERSITY / REDUNDANCY REQUIREMENTS	
		LOCAL PHONE NUMBER	

Site 3 Edit

POP SITE	London NORTH BUILDING, CORNHILL AVE. 14, LONDON, GB S1A 2AA	MCR TARGET PRICE	0.00 USD
BANDWIDTH REQUESTED	10 Mbps	INTERFACE TYPE	GigabitEthernet-LX+Single Mode+SC/PC

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FIG. 6E

Welcome
ADMIN-XO
Help | Change Password | Log Out

75597

Quote Summary Request


Quote Request: Network 1

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>COMPONENT NAME</td><td>Network 1</td></tr> <tr><td>INSTALLED REQUEST DATE</td><td>30-Mar-2012</td></tr> <tr><td>CURRENCY POLICY POSITION</td><td>USD</td></tr> <tr><td>CONTRACT TERM</td><td>12-24 months</td></tr> </table>	COMPONENT NAME	Network 1	INSTALLED REQUEST DATE	30-Mar-2012	CURRENCY POLICY POSITION	USD	CONTRACT TERM	12-24 months	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>DISCOUNT</td><td>502317</td></tr> <tr><td>REQUEST STATUS</td><td>Submitted</td></tr> <tr><td>STATUS UPDATE DATE</td><td>27-Jan-2012</td></tr> <tr><td>LOCATION</td><td>Administrators, NY Point R St</td></tr> <tr><td>ENROLLMENT DATE</td><td>27-Jan-2012</td></tr> </table>	DISCOUNT	502317	REQUEST STATUS	Submitted	STATUS UPDATE DATE	27-Jan-2012	LOCATION	Administrators, NY Point R St	ENROLLMENT DATE	27-Jan-2012
COMPONENT NAME	Network 1																		
INSTALLED REQUEST DATE	30-Mar-2012																		
CURRENCY POLICY POSITION	USD																		
CONTRACT TERM	12-24 months																		
DISCOUNT	502317																		
REQUEST STATUS	Submitted																		
STATUS UPDATE DATE	27-Jan-2012																		
LOCATION	Administrators, NY Point R St																		
ENROLLMENT DATE	27-Jan-2012																		

Service Information

REQUEST DESCRIPTION	Point to Multipoint Ethernet
NUMBER OF SITES	3
MIN SIZE	1500 Bytes

Site Information


Map | Satellite

Site 1-Hub

NAME	New York 75 Broad Street, 8RD Floor, Manhattan, NY 10004
SITE NAME	

Site 2

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>ADDRESS</td><td>550 W Adams St, Chicago, Illinois 60661 United States of America</td></tr> <tr><td>MINIMUM REQUESTED</td><td>10 Mbps</td></tr> <tr><td>SITE NAME</td><td></td></tr> </table>	ADDRESS	550 W Adams St, Chicago, Illinois 60661 United States of America	MINIMUM REQUESTED	10 Mbps	SITE NAME		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>REQUESTED SERVICES</td><td>Unet SpA</td></tr> <tr><td>MINIMUM PRICE</td><td>0.00 USD</td></tr> <tr><td>REQUEST TYPE</td><td>Fixed Ethernet + CAT5 + RJ45</td></tr> <tr><td>REQUESTED SERVICES</td><td>Tagged 802.1q Ethernet Interface</td></tr> <tr><td>DISCOUNT / REPLAN / RISK</td><td></td></tr> <tr><td>CUSTOMER POINT TO POINT</td><td></td></tr> </table>	REQUESTED SERVICES	Unet SpA	MINIMUM PRICE	0.00 USD	REQUEST TYPE	Fixed Ethernet + CAT5 + RJ45	REQUESTED SERVICES	Tagged 802.1q Ethernet Interface	DISCOUNT / REPLAN / RISK		CUSTOMER POINT TO POINT	
ADDRESS	550 W Adams St, Chicago, Illinois 60661 United States of America																		
MINIMUM REQUESTED	10 Mbps																		
SITE NAME																			
REQUESTED SERVICES	Unet SpA																		
MINIMUM PRICE	0.00 USD																		
REQUEST TYPE	Fixed Ethernet + CAT5 + RJ45																		
REQUESTED SERVICES	Tagged 802.1q Ethernet Interface																		
DISCOUNT / REPLAN / RISK																			
CUSTOMER POINT TO POINT																			

Site 3

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>NAME</td><td>London-FORTH BUILDING CORNING AVE. 14, LONDON, GB E14 2AA</td></tr> </table>	NAME	London-FORTH BUILDING CORNING AVE. 14, LONDON, GB E14 2AA	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>MINIMUM PRICE</td><td>0.00 USD</td></tr> </table>	MINIMUM PRICE	0.00 USD
NAME	London-FORTH BUILDING CORNING AVE. 14, LONDON, GB E14 2AA				
MINIMUM PRICE	0.00 USD				

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FIG. 6F

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Administration
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View Quote Request Summary

Quote Response Summary

Quote Request Details

Quote Request ID: 402317
Request Name: Network 1
Target In Service Date: 30-Mar-2012

Request Status: Quote Ready
Created By: Administrator, NT Portal K Sr.
Created Date: 27-Jan-2012
Currency For Quoted Price: USD

Service Information

Service Configuration: Point to Multipoint Ethernet
Number of Sites: 3

Pricing Table

Contract Terms: 24 Months
Quote Valid Until: 09-Mar-2012

Site	Bandwidth	Supplier	Billed By Tinnet NRC	MRC	Billed By Other NRC	MRC	Bus Day Lead	Status
New York: 75 BROAD STREET, 3RD FLOOR, MANHATTAN, NY 10004								Existing
550 W Adams St, Chicago, Illinois 60661 USA	10 Mbps	Tinnet SpA	1,950.12 USD	2,650.00 USD			60	Ready to order
London-NORTH BUILDINGS, CORNHILL AVE. 1A, LONDON, GB E14 2AA	10 Mbps	Tinnet SpA	750.00 USD	750.00 USD	0.00 USD	0.00 USD	60	Ready to order
TOTAL TINNET BILL FOR SOLUTION 2,700.12 USD 3,400.00 USD								

Cancel

Create Order

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FIG. 6G

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Create EtherCloud Order

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Order Information Edit +

ORDER ID: 11001045 DESIRED DUE DATE: 20-Mar-2012

Service Information +

SERVICE CONFIGURATION: Point to Multipoint Ethernet NUMBER OF SITES: 3

Site 1 Edit +

ENM SITE: New York, 75 BROAD STREET, 3RD FLOOR, MANHATTAN, NY 10004

Site 2 Edit +

ADDRESS: 550 W Adams St, Chicago, Illinois 60661 USA BANDWIDTH: 10 Mbps

Site 3 Edit +

TINET SITE: London-NORTH BUILDING, CORNHILLER AVE 14, LONDON, GR E14 5AA BANDWIDTH: 10 Mbps

Pricing Table

CONTRACT TERM: 36 Months

Site	Supplier	NRC	MRC
New York, 75 BROAD STREET, 3RD FLOOR, MANHATTAN, NY 10004		0.00 USD	0.00 USD
550 W Adams St, Chicago, Illinois 60661 USA		1,650.12 USD	2,450.00 USD
London-NORTH BUILDING CORNHILLER AVE 14, LONDON, GR E14 5AA		750.00 USD	750.00 USD
TOTAL TINET BILL RICH SOLUTION		2,700.12 USD	3,450.00 USD

Notes

NOTES: + + +

Maximum Characters: 1000

CANCEL ✕ + SUBMIT FOR PRESALE CHECK +

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FIG. 6H

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Create EtherCloud Order

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Administration

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Order Information

ORDER ID	1501045
ORDER TYPE	New
ORDER STATUS	Incomplete
CUSTOMER ORDER NUMBER	00-nv-ken-1
ORDERED BY	Administrator, NT Portal K Sr.
PAYMENT METHOD	Wire Transfer
ORDER CONTACT	Name, Last Mra. (Multiple) Admin@ethercloud.com
BILLING CONTACT	Last, FirstName (MIFIRST) Mid Mra. (Multiple) (Multiple)
DESIRED DUE DATE	30-Mar-2012
EXPEDITE	No
PRESALE CHECK COMPLETE	
COMPRISED DUE DATE	
BILLING TERMS	Quarterly in Advance
QUOTE REQUEST ID	402317
MAIN TECH CONTACT	Last, FirstName (MIFIRST) Mid Mra. (Multiple) (Multiple)

Service Information

SERVICE CONFIGURATION	Point to Multipoint Ethernet	NUMBER OF SITES	3
MTU SIZE	1500 Bytes		

Site 1

ENR SITE	New York 75 BROAD STREET, 8RD FLOOR, MANHATTAN, NY 10004
----------	--

Site 2

Location Details

TAIL CIRCUIT ORDERED BY	TINETV	Yes
ADDRESS	250 W Adams St. Chicago, Illinois 60581 USA	
BANDWIDTH	10 Mbps	

Service Details

CFA	
LOCAL CONTACT	John Smith +1 2123605595 jsmith@tinet.com
INTERFACE TYPE	FastEthernet+CAT5+RJ45
INTERFACE DETAILS	Tagged 802.1Q Ethernet Interface
CONNECTION LOCATION	Customer Rack

Site 3

Location Details

TINET SITE	London-NORTH BUILDING CORAMANDER AVE. 14, LONDON, GB E14 2AA
------------	--

Service Details

CFA	
INTERFACE TYPE	GigE Ethernet-LX+Single Mode SC-PC
INTERFACE DETAILS	Tagged 802.1Q Ethernet Interface
CONNECTION LOCATION	Customer Rack

Pricing Table

CONTRACT TERM		24 Months	
Site	Supplier	NRC	MRC
New York 75 BROAD STREET, 8RD FLOOR, MANHATTAN, NY 10004		0.00 USD	0.00 USD
250 W Adams St. Chicago, Illinois 60581 USA		1,650.12 USD	2,850.00 USD
LONDON-NORTH BUILDING, CORAMANDER AVE, 14, LONDON, GB E14 2AA		750.00 USD	750.00 USD
TOTAL TINET BILL FOR SOLUTION		2,750.12 USD	3,420.00 USD

Notes

NOTES

Maximum Characters: 1500

CANCEL

SUBMIT FOR PRESALE CHECK

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FIG. 6I

Welcome
ADMIN-XO[Help](#) | [Change Password](#) | [Log Out](#)

Dashboard Quotes > Orders > EtherVision Trouble Tickets > Contacts Administration > Contact Us	<h2 style="text-align: center;">EtherCloud Order Summary</h2>																																					
<h3>Order Information</h3> <table border="1"> <tr> <td>ORDER ID</td> <td>F011045</td> <td>REORDER DUE DATE</td> <td>16-Mar-2013</td> </tr> <tr> <td>ORDER TYPE</td> <td>New</td> <td>EXPEDITE</td> <td>No</td> </tr> <tr> <td>ORDER STATUS</td> <td>Pending</td> <td>PRESALE CHECK COMPLETE</td> <td></td> </tr> <tr> <td>CUSTOMER ORDER NUMBER</td> <td>00101001</td> <td>CONFIRMED DUE DATE</td> <td></td> </tr> <tr> <td>ORDERED BY</td> <td>Administrator, NY Postal X St.</td> <td>CLOSED DATE</td> <td></td> </tr> <tr> <td>PAYMENT METHOD</td> <td>Wire Transfer</td> <td>BILLING TERMS</td> <td>Quantity in Advance</td> </tr> <tr> <td>TINET SERVICE ID</td> <td></td> <td>QUOTE REQUEST ID</td> <td>402317</td> </tr> <tr> <td>ORDERING CONTACT</td> <td>Marine Testers (Multiple) testers@ethernet.com</td> <td>MAIN TECH CONTACT</td> <td>Levi Froehner (Multiple) (Multiple)</td> </tr> <tr> <td>BILLING CONTACT</td> <td>Levi Froehner (Multiple) (Multiple)</td> <td></td> <td></td> </tr> </table> <p> SHOW ORDER PROGRESS SHOW ORDER NOTES </p>			ORDER ID	F011045	REORDER DUE DATE	16-Mar-2013	ORDER TYPE	New	EXPEDITE	No	ORDER STATUS	Pending	PRESALE CHECK COMPLETE		CUSTOMER ORDER NUMBER	00101001	CONFIRMED DUE DATE		ORDERED BY	Administrator, NY Postal X St.	CLOSED DATE		PAYMENT METHOD	Wire Transfer	BILLING TERMS	Quantity in Advance	TINET SERVICE ID		QUOTE REQUEST ID	402317	ORDERING CONTACT	Marine Testers (Multiple) testers@ethernet.com	MAIN TECH CONTACT	Levi Froehner (Multiple) (Multiple)	BILLING CONTACT	Levi Froehner (Multiple) (Multiple)		
ORDER ID	F011045	REORDER DUE DATE	16-Mar-2013																																			
ORDER TYPE	New	EXPEDITE	No																																			
ORDER STATUS	Pending	PRESALE CHECK COMPLETE																																				
CUSTOMER ORDER NUMBER	00101001	CONFIRMED DUE DATE																																				
ORDERED BY	Administrator, NY Postal X St.	CLOSED DATE																																				
PAYMENT METHOD	Wire Transfer	BILLING TERMS	Quantity in Advance																																			
TINET SERVICE ID		QUOTE REQUEST ID	402317																																			
ORDERING CONTACT	Marine Testers (Multiple) testers@ethernet.com	MAIN TECH CONTACT	Levi Froehner (Multiple) (Multiple)																																			
BILLING CONTACT	Levi Froehner (Multiple) (Multiple)																																					
<h3>Service Information</h3> <table border="1"> <tr> <td>SERVICE CONFIGURATION</td> <td>Point to Multipoint Ethernet</td> <td>NUMBER OF SITES</td> <td>3</td> </tr> <tr> <td>MTU SIZE</td> <td>1500 Bytes</td> <td></td> <td></td> </tr> </table>			SERVICE CONFIGURATION	Point to Multipoint Ethernet	NUMBER OF SITES	3	MTU SIZE	1500 Bytes																														
SERVICE CONFIGURATION	Point to Multipoint Ethernet	NUMBER OF SITES	3																																			
MTU SIZE	1500 Bytes																																					
<h3>Site 1</h3> <h4>Location Details</h4> <table border="1"> <tr> <td>EDGE SITE</td> <td>New York 10 BROAD STREET 3RD FLOOR, MANHATTAN NY 10004</td> <td>SVN ID</td> <td>32-XAP-3-15025-7-N71</td> </tr> </table> <h4>Service Details</h4> <table border="1"> <tr> <td>NORMALIZE CLASS OF SERVICE</td> <td>NO</td> </tr> </table> <h4>Fault and Performance Management/Service DAM</h4> <table border="1"> <tr> <td>WILL YOU PEER WITH TINET ON LEAF 4?</td> <td>NO</td> <td>WILL THE END CUSTOMER PEER WITH TINET ON LEAF 4 ON R?</td> <td>NO</td> </tr> </table> <p>SHOW SITE PROGRESS</p>			EDGE SITE	New York 10 BROAD STREET 3RD FLOOR, MANHATTAN NY 10004	SVN ID	32-XAP-3-15025-7-N71	NORMALIZE CLASS OF SERVICE	NO	WILL YOU PEER WITH TINET ON LEAF 4?	NO	WILL THE END CUSTOMER PEER WITH TINET ON LEAF 4 ON R?	NO																										
EDGE SITE	New York 10 BROAD STREET 3RD FLOOR, MANHATTAN NY 10004	SVN ID	32-XAP-3-15025-7-N71																																			
NORMALIZE CLASS OF SERVICE	NO																																					
WILL YOU PEER WITH TINET ON LEAF 4?	NO	WILL THE END CUSTOMER PEER WITH TINET ON LEAF 4 ON R?	NO																																			
<h3>Site 2</h3> <h4>Location Details</h4> <table border="1"> <tr> <td>YAL LINKED ORDERED BY TINET</td> <td>Yes</td> <td>ETHERCLOUD PARTNER</td> <td></td> </tr> <tr> <td>ADDRESS</td> <td>550 N Adams St. Chicago, IL 60601 USA</td> <td>LEAD TIME FOR LOCAL YAL CIRCUIT</td> <td>60 Business Days</td> </tr> <tr> <td>BAVENWIDTH</td> <td>10 Mbps</td> <td></td> <td></td> </tr> </table> <h4>Service Details</h4> <table border="1"> <tr> <td>CFA</td> <td></td> <td>INTERFACE TYPE</td> <td>FastEthernet - CAT5 - RJ45</td> </tr> <tr> <td>LOCAL CONTACT</td> <td>John Smith +1 312 288 0055 john@SM.com</td> <td>INTERFACE DETAILS</td> <td>Tagged 802.1q Ethernet interface</td> </tr> <tr> <td></td> <td></td> <td>CONNECTION LOCATION</td> <td>Customer Rack</td> </tr> </table> <p>SHOW SITE PROGRESS</p>			YAL LINKED ORDERED BY TINET	Yes	ETHERCLOUD PARTNER		ADDRESS	550 N Adams St. Chicago, IL 60601 USA	LEAD TIME FOR LOCAL YAL CIRCUIT	60 Business Days	BAVENWIDTH	10 Mbps			CFA		INTERFACE TYPE	FastEthernet - CAT5 - RJ45	LOCAL CONTACT	John Smith +1 312 288 0055 john@SM.com	INTERFACE DETAILS	Tagged 802.1q Ethernet interface			CONNECTION LOCATION	Customer Rack												
YAL LINKED ORDERED BY TINET	Yes	ETHERCLOUD PARTNER																																				
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CFA		INTERFACE TYPE	FastEthernet - CAT5 - RJ45																																			
LOCAL CONTACT	John Smith +1 312 288 0055 john@SM.com	INTERFACE DETAILS	Tagged 802.1q Ethernet interface																																			
		CONNECTION LOCATION	Customer Rack																																			
<h3>Site 3</h3> <h4>Location Details</h4> <table border="1"> <tr> <td>TINET SITE</td> <td>London NORTH B R 2808 CORRANCR AVE 14, LONDON, GB E14 2AA</td> <td>BANDWIDTH</td> <td>10 Mbps</td> </tr> </table> <h4>Service Details</h4> <table border="1"> <tr> <td>CFA</td> <td></td> <td>INTERFACE TYPE</td> <td>GigabitEthernet-LX - SFP Module - SFP</td> </tr> <tr> <td></td> <td></td> <td>INTERFACE DETAILS</td> <td>Tagged 802.1q Ethernet interface</td> </tr> <tr> <td></td> <td></td> <td>CONNECTION LOCATION</td> <td>Customer Rack</td> </tr> </table> <p>SHOW SITE PROGRESS</p>			TINET SITE	London NORTH B R 2808 CORRANCR AVE 14, LONDON, GB E14 2AA	BANDWIDTH	10 Mbps	CFA		INTERFACE TYPE	GigabitEthernet-LX - SFP Module - SFP			INTERFACE DETAILS	Tagged 802.1q Ethernet interface			CONNECTION LOCATION	Customer Rack																				
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CFA		INTERFACE TYPE	GigabitEthernet-LX - SFP Module - SFP																																			
		INTERFACE DETAILS	Tagged 802.1q Ethernet interface																																			
		CONNECTION LOCATION	Customer Rack																																			

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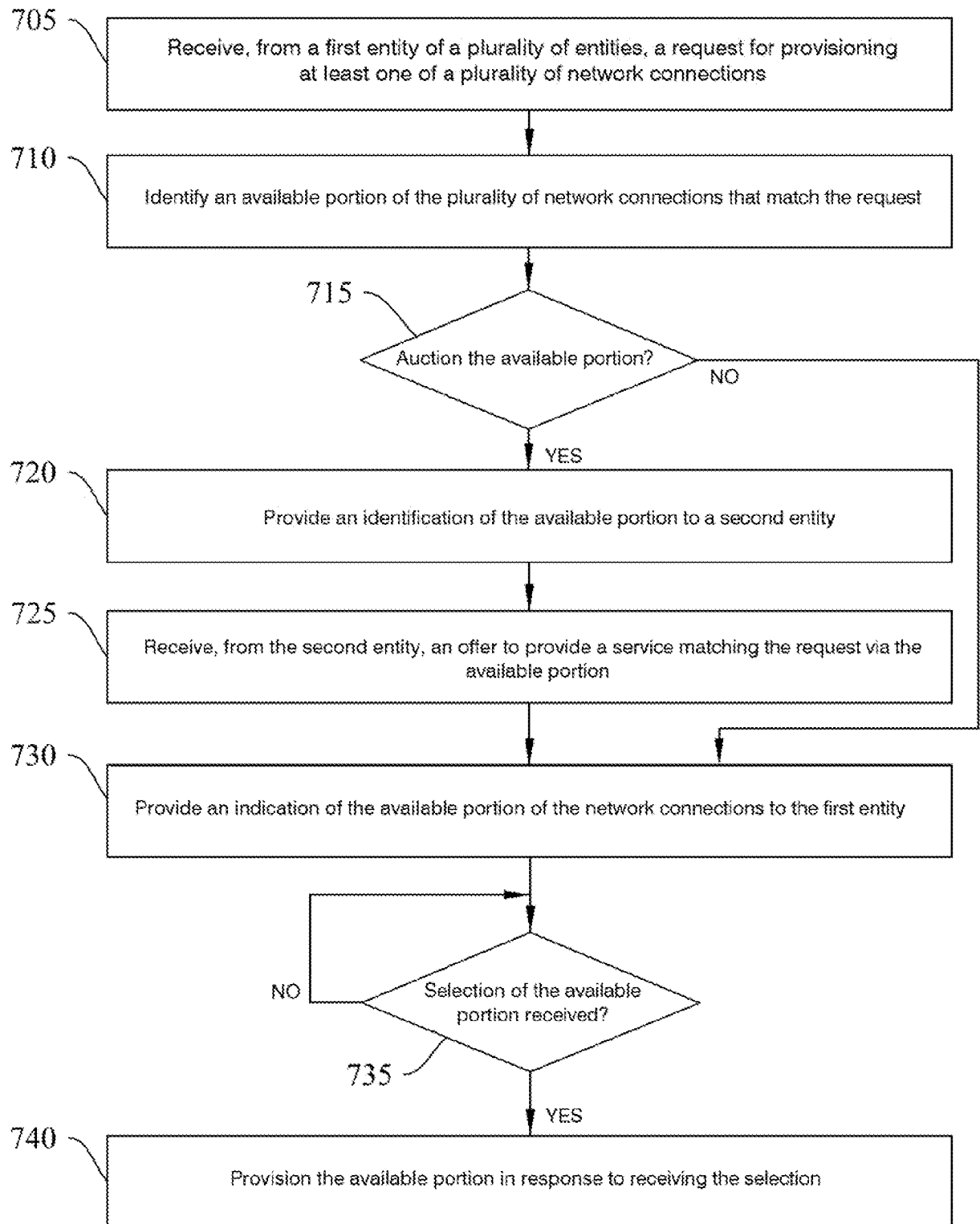


FIG. 7

A. CLASSIFICATION OF SUBJECT MATTER**H04L 12/28(2006.01)i, H04L 12/24(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04L 12/28; H04Q 7/24; G06F 3/00; G06Q 30/00; G06F 17/60; H04L 12/66; H04L 9/00; H04L 12/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: interconnection, external elements, central service network, server, portal application, quality of service, redundancy, router, switch, VPN and MPLS, and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011-0060657 A1 (CRAIG ALAN WALDROP et al.) 10 March 2011 See paragraphs [0004], [0025], [0030]-[0044], [0057]-[0062], [0071]-[0079], [0082]-[0087], [0098] and [0111]; claims 1-2; and figures 1A-1C, 2, 3C, 5, 7A, 9 and 11.	1-20, 22-43
Y		21
A		44
Y	US 2001-0047311 A1 (BHAVESH SINGH) 29 November 2001 See paragraphs [0005]-[0010] and [0041]; claims 1 and 4; and figure 1.	21
A	KR 10-2011-0065973 A (ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE) 16 June 2011 See paragraphs [0027]-[0035]; claims 1-18; and figure 2.	1-44
A	US 2009-0022117 A1 (THOMAS QUIGLEY et al.) 22 January 2009 See paragraphs [0022]-[0024]; claims 1-8; and figure 1A.	1-44
A	US 2005-0210297 A1 (JONATHAN WU et al.) 22 September 2005 See paragraphs [0010]-[0013]; claim 1; and figure 1.	1-44



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

01 July 2013 (01.07.2013)

Date of mailing of the international search report

02 July 2013 (02.07.2013)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
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302-701, Republic of Korea

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Authorized officer

NHO, Ji Myong

Telephone No. 82-42-481-8528



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