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**WO 01/45327 A1**

(54) Title: INFORMATION NETWORK MANAGEMENT SYSTEM

(57) Abstract: This invention is a method of and system for the managing and monitoring of services on an information network. More specifically it relates to the use of an administrative server with managing means to control and monitor one or more of; main servers, application servers and databases connected or connectable to the network. Systems software provides an interface for users to manage and monitor services.

# INFORMATION NETWORK MANAGEMENT SYSTEM

## TECHNICAL FIELD

This invention relates to a method of and system for the managing and monitoring of services on an information network. More specifically it relates to the use of an administrative server with managing means to control and monitor one or more of; main  
5 servers, application servers and databases connected or connectable to the network

10

## BACKGROUND ART

With the introduction of the Internet and associated applications from e-mail to e-commerce and Internet access there is an increasing need to enable service providers to automate some of the tedious tasks associated with administering users and billing systems.

15

## OBJECTIVES OF THE INVENTION

Accordingly, it is an object of the present invention to provide a system and method for  
20 the managing and monitoring of services on information networks. More specifically it relates to the use of administrative servers to manage and control services and billing networks of service providers.

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## DISCLOSURE OF INVENTION

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According to the first aspect of the invention there is included a method of managing and monitoring services on an information network, the method including the steps of:

- providing at least one interactive communication network to which is connected or  
10 connectable at least one or more main servers including one or more of: a Unix web server, a NT web server and a DNS server;
- providing at least one application server for providing an information product or service;
- providing at least one database connected to the network; and
- 15 – providing at least one administrative server with managing means to control and monitor one or more of: the main servers, application servers and databases connected to the network

According to second aspect of the invention the interactive communication network may  
20 be connected to the public information network via a routing device or system.

According to the third aspect of the invention the routing device or system may include one or more of: users and domain registrars.

According to the fourth aspect of the invention the application server may include one or more of; a mail server, a proxy server, a franking server and a network management server.

5 According to the fifth aspect of the invention there is included a system for managing and monitoring services on an information network, the system comprising:

– at least one interactive communication network to which is connected or connectable at least one or more main servers including one or more of: a Unix web  
10 server, a NT web server and a DNS server;

at least one application server for providing an information product or service;

– at least one database connected to the network;

– one administrative server with managing means to control and monitor one or more  
of: the main servers, application servers and databases connected to the network;

15 and

– systems software facilitating in providing a user interface for managing and  
monitoring services on the information network.

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## BRIEF DESCRIPTION OF DRAWINGS

Preferred embodiments of the invention will now be described by means of non-limiting  
5 examples only, with reference to the accompanying diagrams wherein:

- Figure 1 is a basic block diagram of the network and system according to the invention;
- Figure 2 specifically illustrates the components and functionality of the administrator  
10 server;
- Figure 3 includes the functionality's and operational functions of a web server;
- Figure 4 shows the functions of the Primary name server;
- Figure 5 relates to the functions of ISP staff given;
- Figure 6 includes authentication procedures according to the invention;
- 15 Figure 7 relates to server management;
- Figure 8 illustrated ISP total control over the packages that are sold through the system;
- Figure 9 includes the function and operation of the system which provides ISP's reports;
- 20 Figure 10 includes client management functions and procedures;
- Figure 11 more specifically relates to the registration process;
- Figure 12 relates to customers having access to certain reports; and
- Figure 13 illustrates how administration of domains is done through a web

## BEST MODES FOR CARRYING OUT THE INVENTION

Turning to **Figure 1** which is a basic block diagram of the network and system according  
5 to the invention comprising a communications network (1) with a central communications  
backbone (2) i.e. an Ethernet communications network to which is attached one or more  
of the following: Unix webservers (3), NT web servers (4), mail servers (5) and DNS  
servers (6). Furthermore the network may be managed and controlled via one or more  
administration servers (7) utilizing the systems software (i.e. Vserv) for managing and  
10 controlling services and users on the network. Also connected to the network is one or  
more accounting databases (8) with user and/or billing information stored thereon. The  
communications backbone connect or be connectable to an information network via a  
router or similar device (9) which facilitates communication to one or more networks  
including an Intranet, Extranet and the Internet (10) having multiple user at home or office  
15 (11) and domain registrars thereon (12). Furthermore the software facilitates the  
administration and control of users, products and services on the network.

**Figure 2** specifically illustrates the components and functionality of the administrator  
20 server (13) including a main computer or workstation (14) ( i.e. Intel PC or Sun

workstation ) including input (21) means for managing and controlling the operation of the computer as well as output means including any one or more of a screen or monitor (22) an printer (23).

The administration server may have communications means with the Internet (24) and/or  
 5 a Intranet (24), Extranet (25) and a local network or WAN (27). Furthermore the server may have storage means i.e mirrored hard disks (16 and 17) operated by the server operating system or server software (15) . Also included within the scope of the operation of the server is backup facilities for backing up system software or data (19) and/or system logging (20) on backup devices i.e. CD-ROM,, magnetic tapes and DAT streamers  
 10 ( not shown) operated by a backup device or peripheral (18).

**Figure 3** includes the functionality and operation functions of a web server (28) including one or more of:

- creating a FTP user (29) (no shell access and rooted to home directory)
- 15 • configuring a home directory for the user (30)
- allocating a quota if supported by the OS; (31) and
- configuring the virtual host entry in the webservers configuration file(32).

Furthermore the Mail server (33) may perform: Creating a POP user account (34) (no shell  
 20 access) and configuring a mail server (35) t accept mail for new domain and sets up

aliases

5

**Figure 4** shows the functions of the Primary name server (36) including on or more of:

- Creating a db file for the new domain (37),
  - adding this to named.boot (38)\_
  - restarts named and updates any secondaries (39) and
- 10 also using for example CORBA, initiates and monitors the domain registration or update process (40).

Registrars (41) may include:

- Sending a request through to the domain registrars (42) and monitors progress (43)
- 15 whether it is a new domain registration (44), an update(45) or a deletion (46)

Furthermore the registering functions may be used to generate reports (47) for the network administrator.

Routers (48) may perform and comprise the step of:

- 20 interrogating the routers for bandwidth utilization (49) and/or utilizing SNMP on an IP



basis per virtual host.

**Figure (5)** relates to the functions of ISP staff given corresponding to the job functions they need to perform including

- 5 Client user administration (51) can manage basic client requirements such as add, delete and modify user information.
- Domain administrator: can add, delete, suspend and modify clients, domains and plug-ins(52)
- ISP Financial officer(53) may have access to view billing reports and
- 10 Network administrator (54): can add, modify and delete servers from the network tree

**Figure 6** includes authentication procedures (57) which require all users to enter their  
15 username (58) and password (59) before access is granted to the administration area (60). Sessions are created (61) with each log-on and the IP from which they originated is tracked (62). If inactive (65), time-out periods apply to all users, after which they must log-on again. If active (64) they may proceed or continue with an existing process (66)

20

**Figure 7** relates to server management (67) whereby as the system software (v:serv) supports distributed networks, server-monitoring services are available through the software to direct specific requirements towards different servers. Functions available are:

- 5 Add and remove servers from available servers list (68)
- Add and remove IP's (69)
- Monitoring running services on servers with problem flagging if they have stopped operating(70)

**Figure 8** illustrates ISP total control over the packages that are sold through the system, the administration interface (80) allows the ISP to set prices for:

- set-up costs (81)
- annual costs(82)
- monthly costs(83)
- 15 months free (84)
- per unit cost (bandwidth) (85) and
- plug-ins (86)(

Setting up packages is done through creating individual products that are then grouped  
20 together for an overall package price. Packages can thus support variable pricing within

a monthly billing price structure as illustrated.

**Figure 9** includes the function and operation (87) of the system which provides ISP's reports on:

5           **LICENSES#** Of Sites

              # Of Domains

              # Of Plug-ins

**FINANCIAL** information (89) may include expected income from clients and discounts given **NETWORK** (90) may include:

10 **Bandwidth Utilisation**

Services running on each server; and

Server logs

**SALES** (91) may include:

Clients over and near quota

15 **CLIENTS** (92) may include:

Domains

Bandwidth Utilisation

Average number of email's per domain

Average Hosting space per domain

20

Furthermore the reports may include a scenario where the system provides the ISP with reports (93) and clients with reports (94)

- 5 **Figure 10** includes client management (95) functions and procedures including ISP administrators (96) through the administration back-end (97) including actions (98) as illustrated (99)
- 10 **Figure 11** more specifically relates to the registration process (100) including the steps of entering a domain name (101) after which it is checked against domain registration (102) including updating a domain (103) or creating a new one (104). After this the package is selected (105) and the packages displayed (106) are checked a product database to which are active. Now personal details are entered (107) after which certain error checks are
- 15 performed (108); now the secure area is entered including entering banking details and confirming a purchase and password (109). The process is executed (110) as illustrated after which the system log's into the main area (111)
- Figure 12** relates to customers (113) having access to certain reports (114) including
- 20 billing reports (115) and Usage reports (116)

**Figure 13** illustrates how administration of domains (117) is done through a web interface (118) including main navigation and specific functions (119) as graphically depicted (120)

Clients receive the following reports:

5 Packages purchased

Quantity utilised (of package)

Plug-ins purchased

Bandwidth utilised

## CLAIMS

1. A method of managing and monitoring services on an information network, the method including the steps of:
  - 5 – providing at least one interactive communication network to which is connected or connectable at least one or more main servers including one or more of: a Unix web server, a NT web server and a DNS server;
  - providing at least one application server for providing an information product or service;
  - 10 – providing at least one database connected to the network; and
  - providing at least one administrative server with managing means to control and monitor one or more of: the main servers, application servers and databases connected to the network
- 15 2. A method as claimed in claim 1 wherein the the interactive communication network is connected to the public information network via a routing device or system.

3. A method as claimed in claim any of the above claims wherein the method of the invention includes a routing device or for one or more of: users and domain registrars.
- 5 4. A method as claimed in claim any of the above claims wherein the application server may include one or more of; a mail server, a proxy server, a franking server and a network management server.
5. A system of managing and monitoring services on an information network, the  
10 system comprising:
- at least one interactive communication network to which is connected or connectable at least one or more main servers including one or more of: a Unix web server, a NT web server and a DNS server;
  - at least one application server for providing an information product or service;
  - 15 - at least one database connected to the network;
  - one administrative server with managing means to control and monitor one or more of: the main servers, application servers and databases connected to the network;
  - and
  - systems software facilitating in providing a user interface for managing and  
20 monitoring services on the information network.

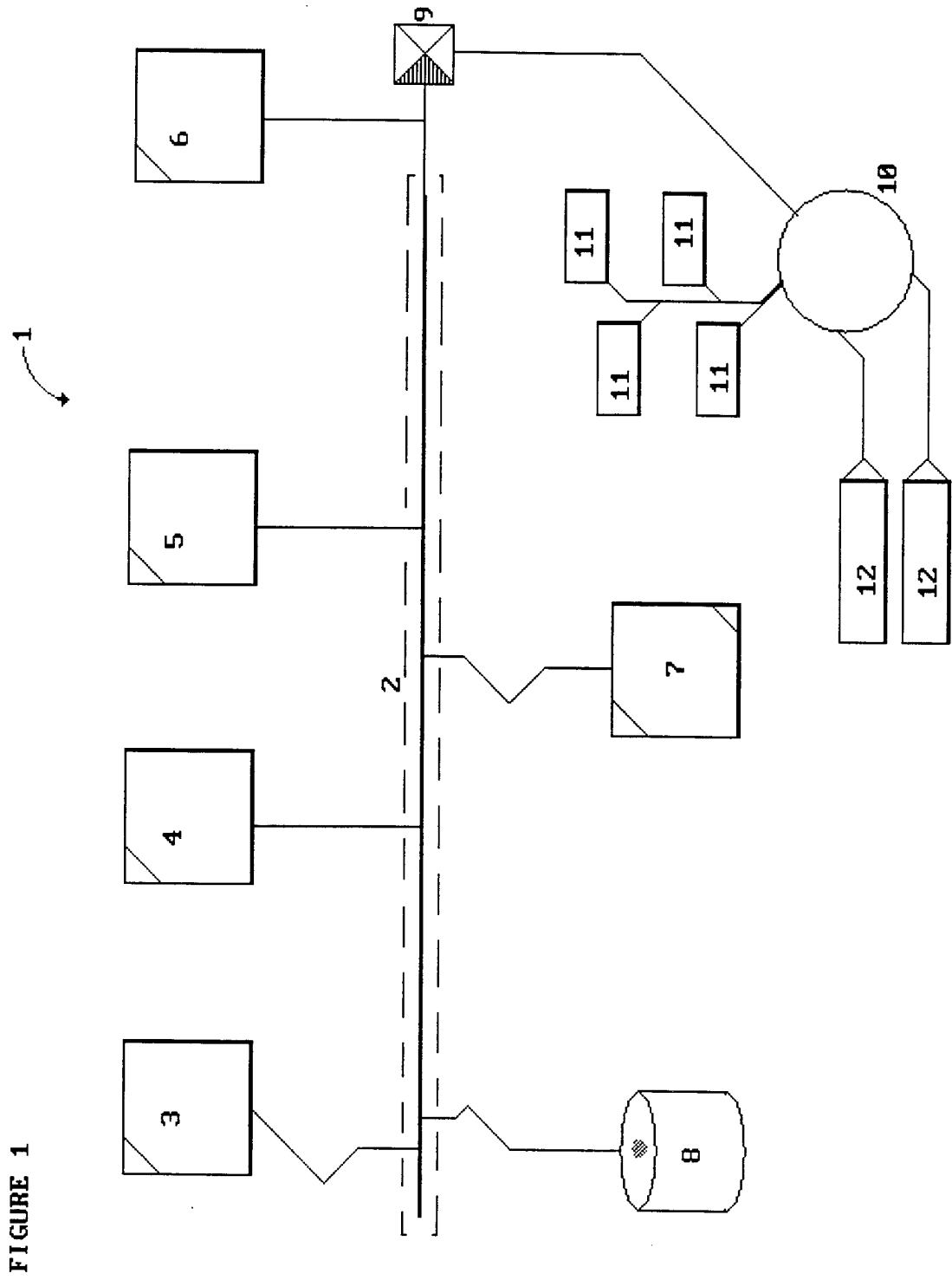


FIGURE 1



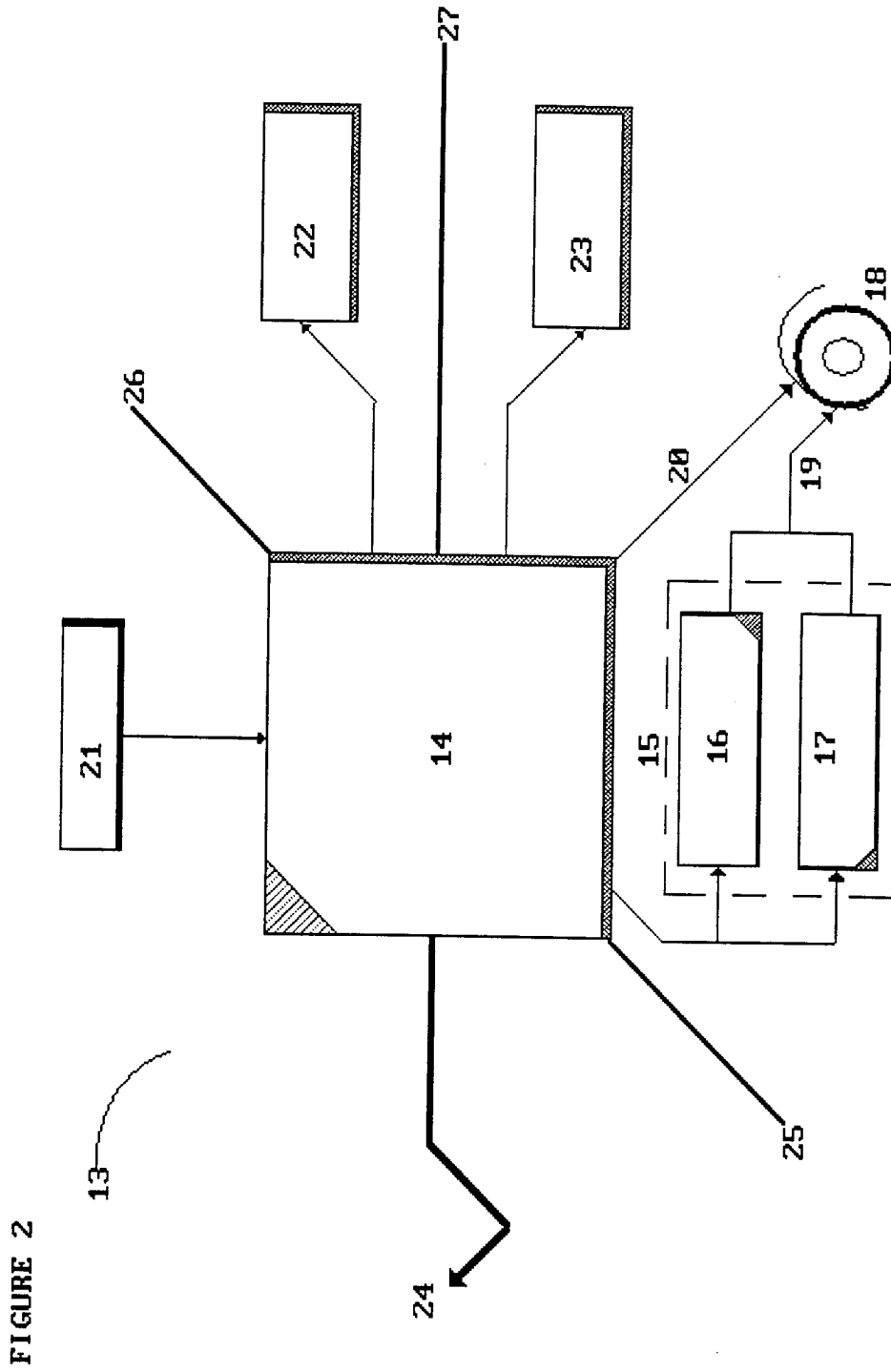
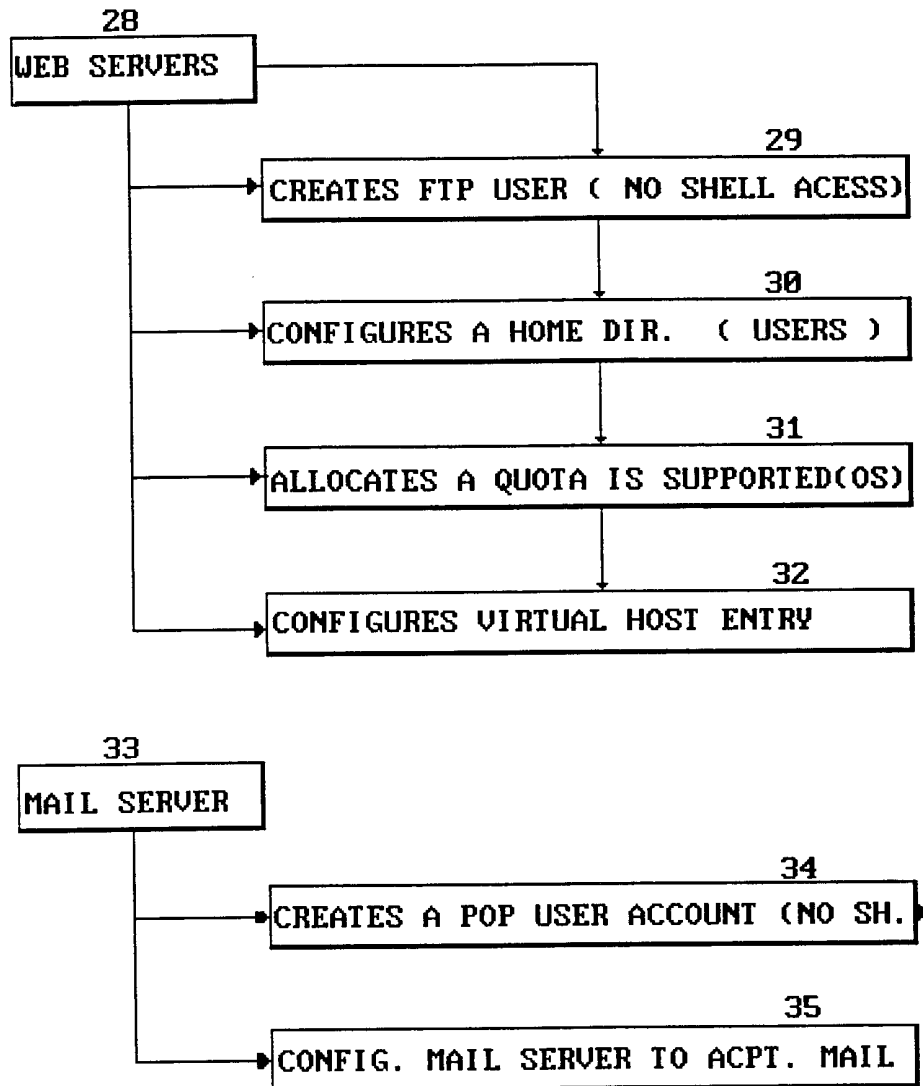


FIGURE 3



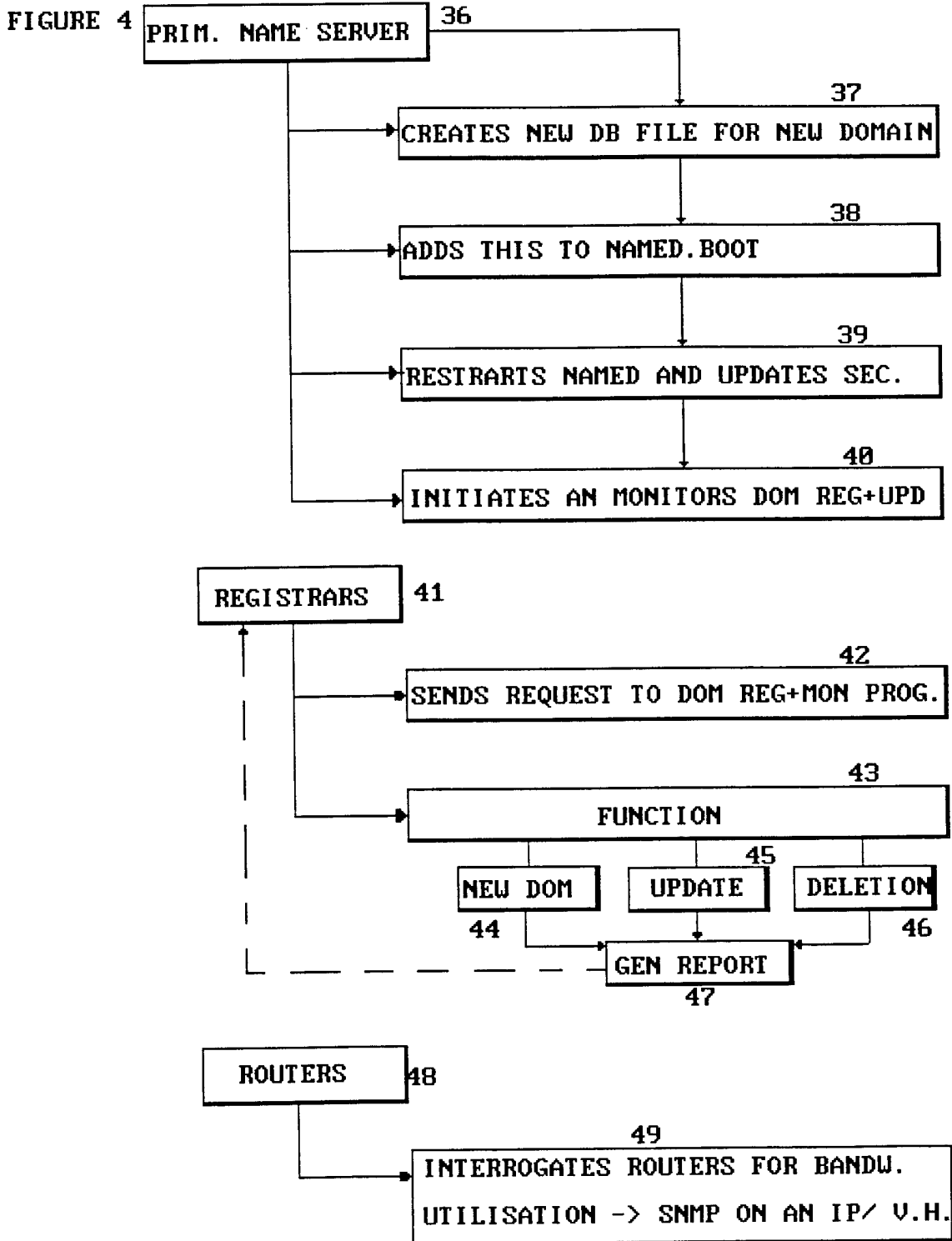


FIGURE 5

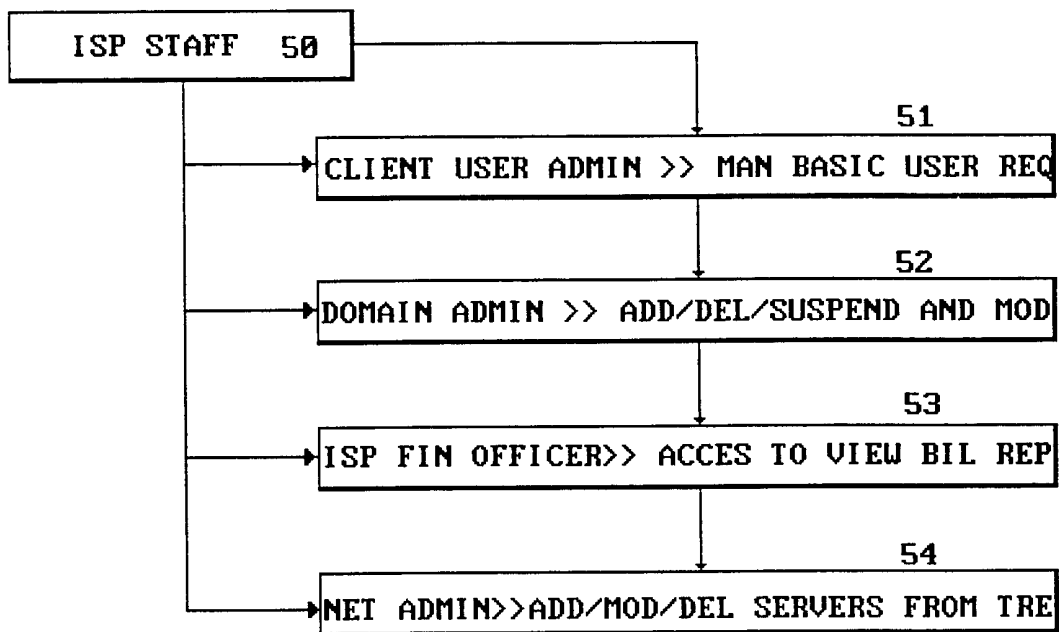


FIGURE 6

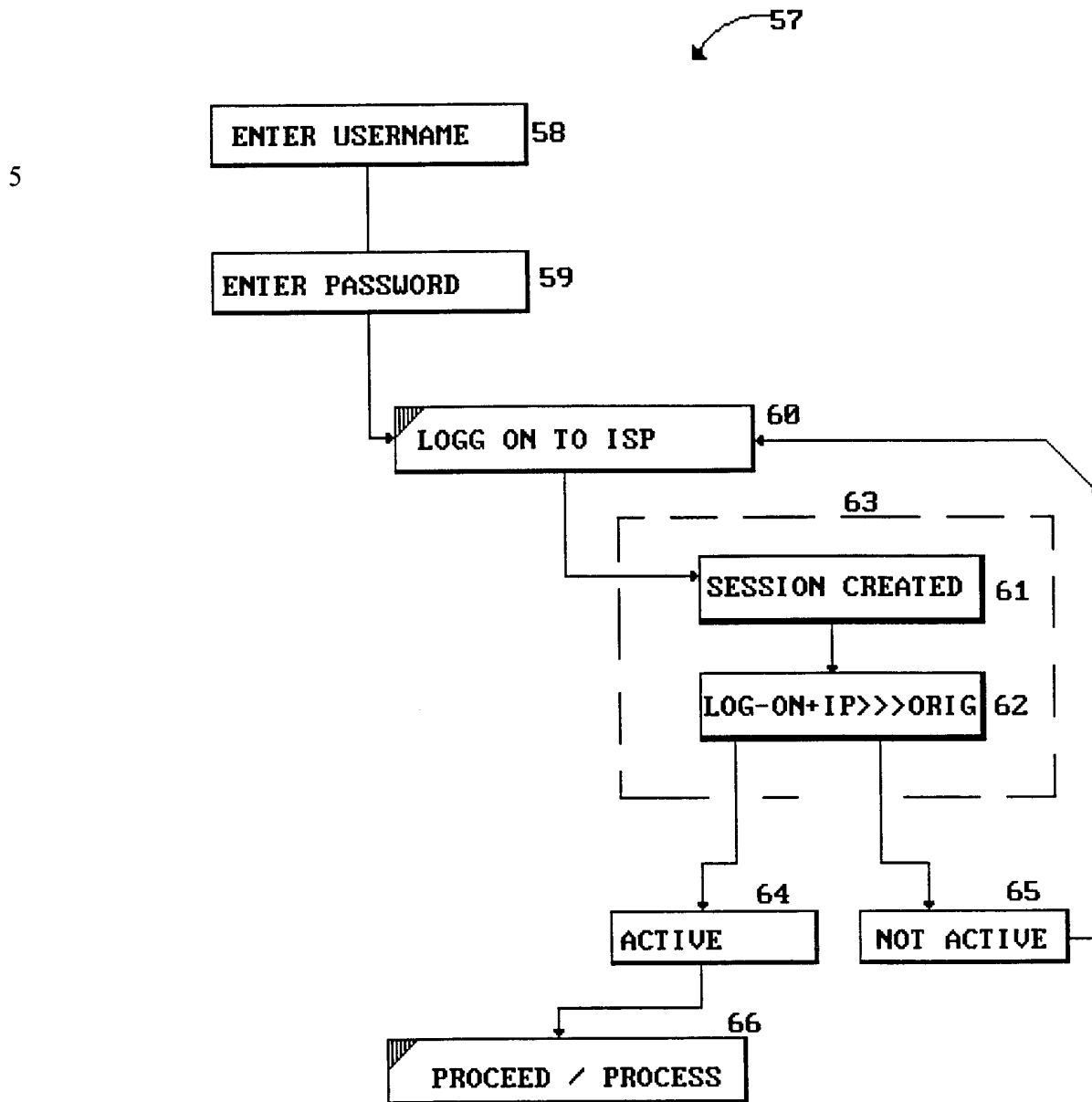


FIGURE 7

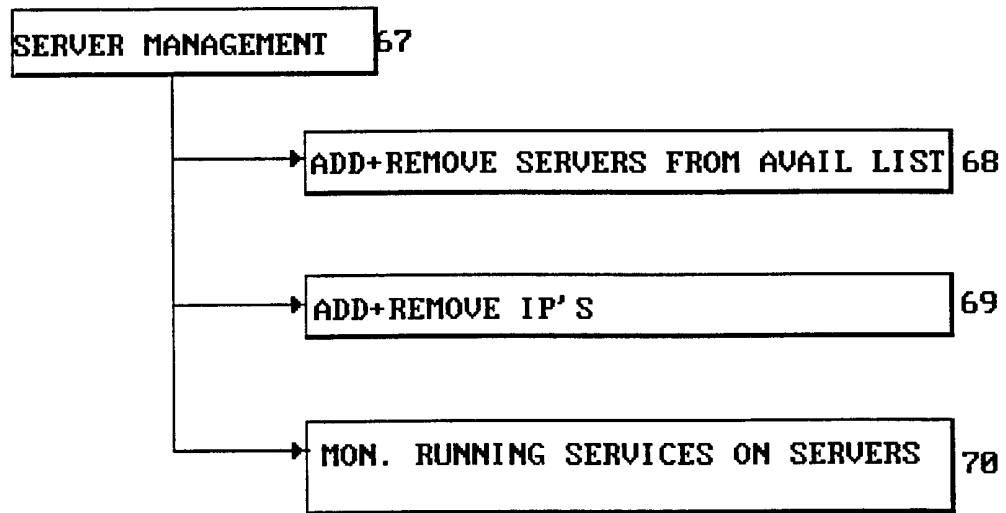
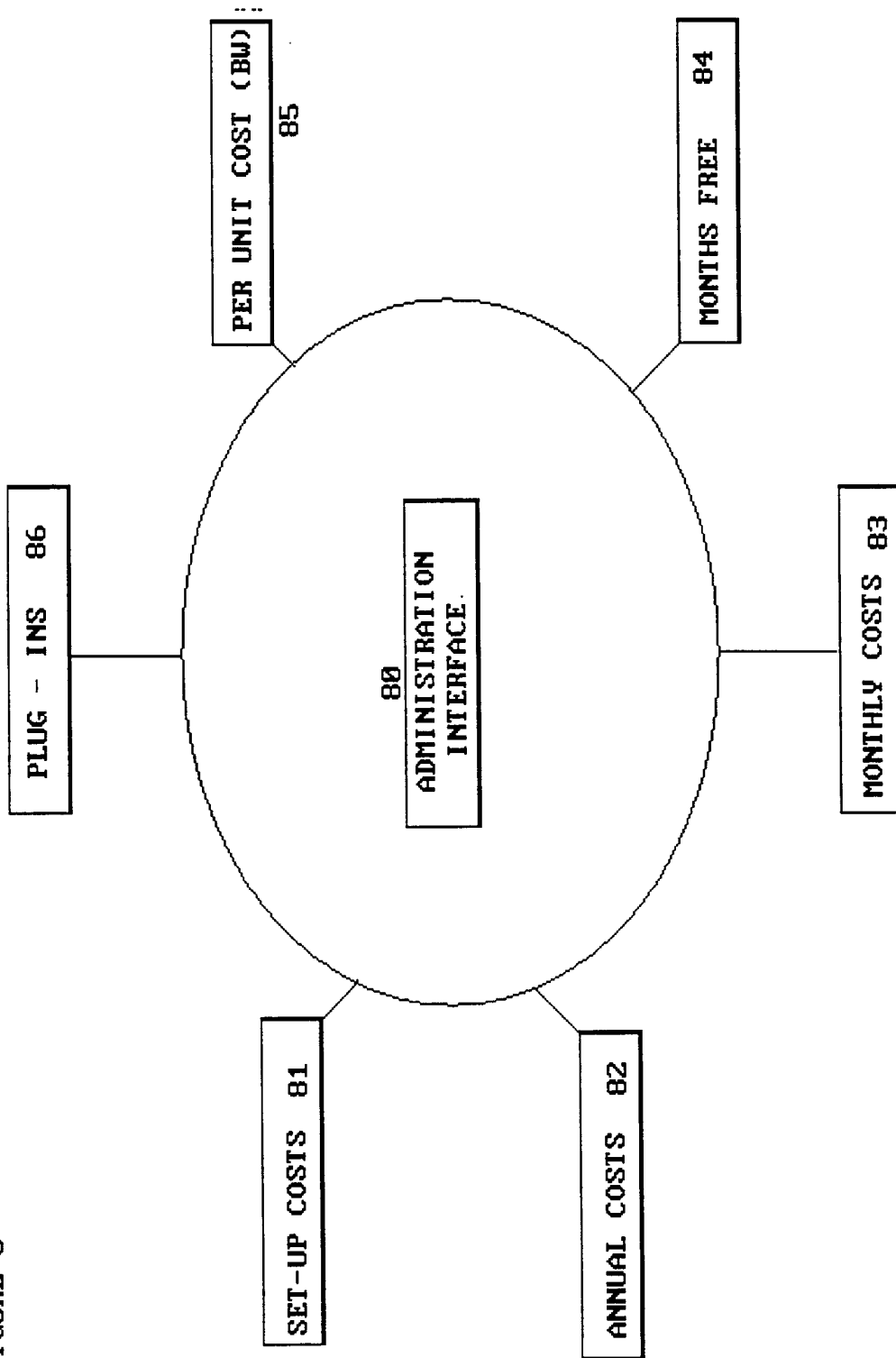


FIGURE 8



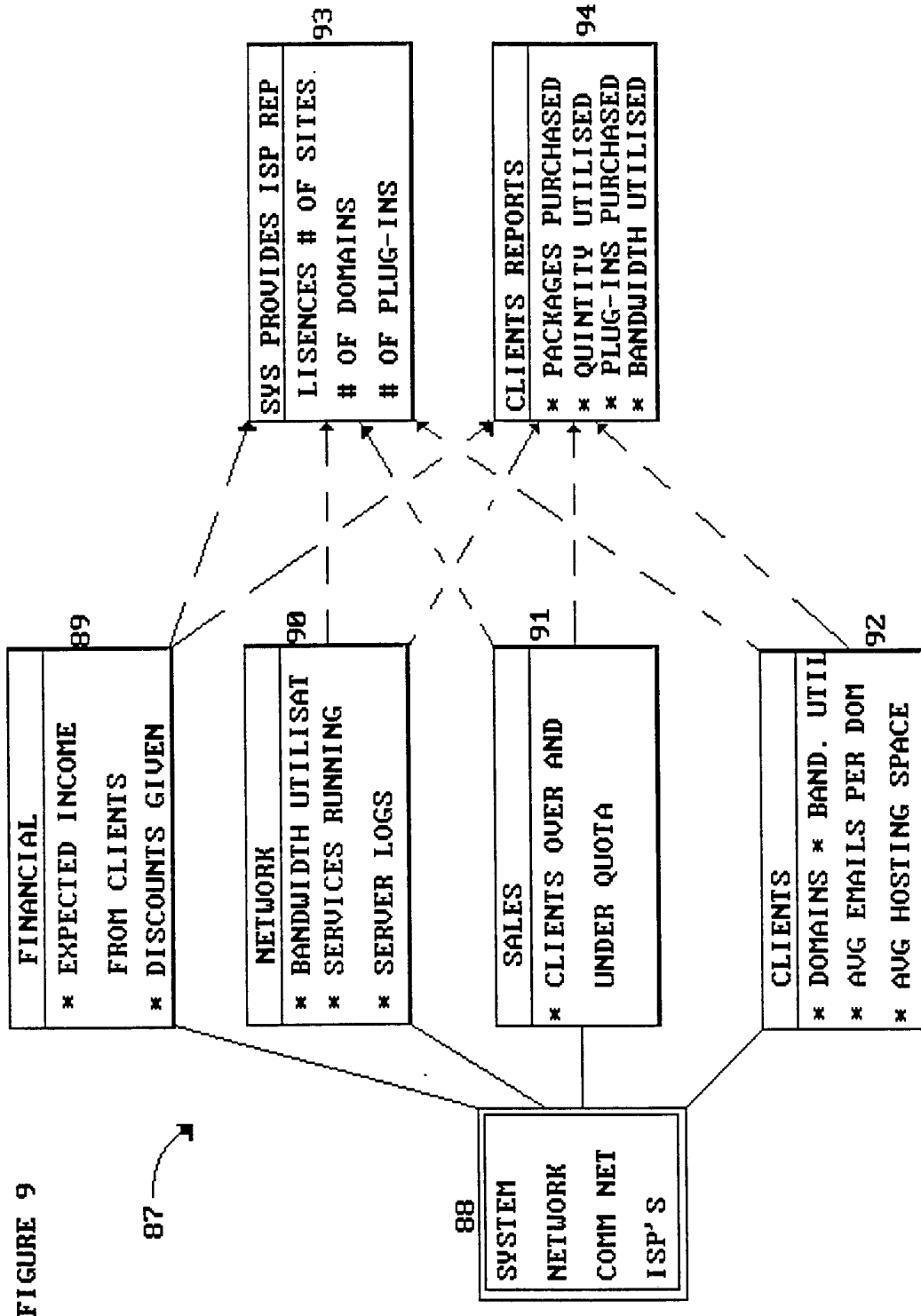


FIGURE 9



FIGURE 10

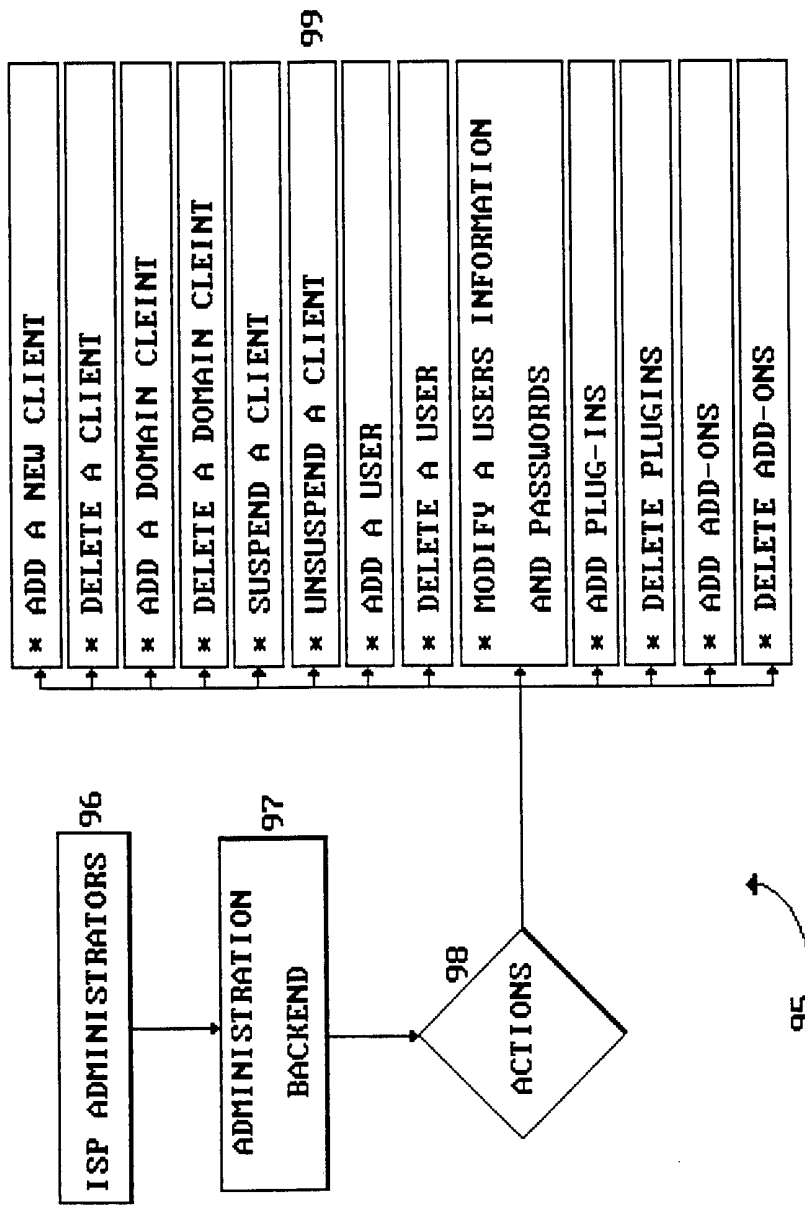
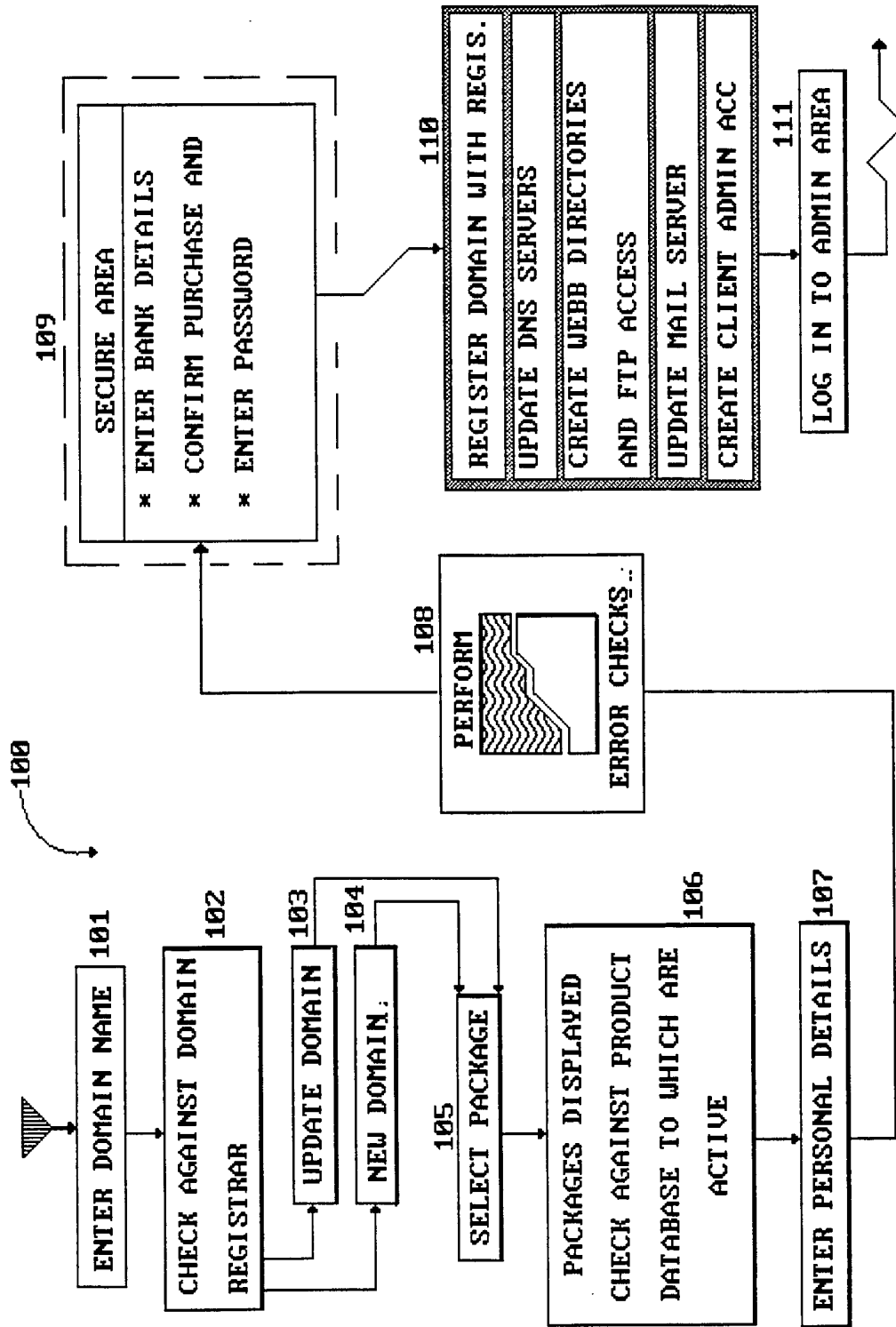


FIGURE 11



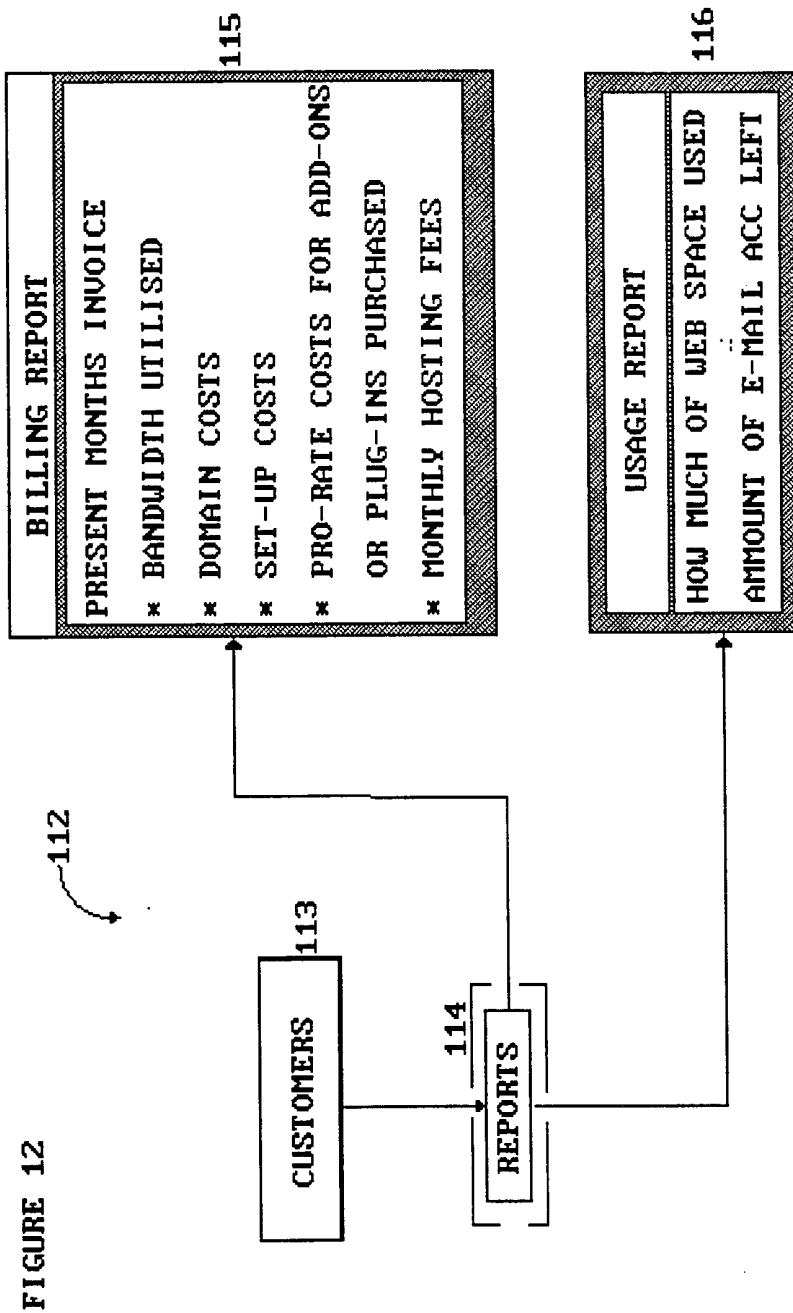
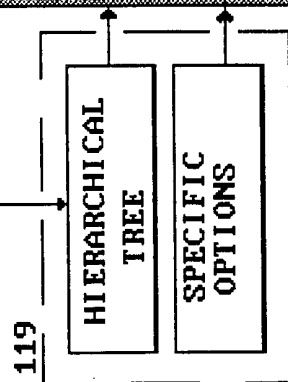


FIGURE 13

117

WEB INTERFACE 118



120

CLIENT>> BILLING DETAILS + GENERAL INFORMATION

DOMAIN>> INFORMATION OF DOMAIN

TOOLBOX> INSTALLED PROD+PACKAGES PLUG-INS+ADD-ONS

PLUG-IN> INSTR AND INFO ON PLUG-INS

USERS >> ADD A USER OR ALIAS AND AMM OF USERS AVAIL

SPE. USER INFO OF SPECIFIC USER, NAME AND MAIL FWD

ALIAS >> INFO RELATING TO SPECIFIC ALAIS

DOM.REP> INFO ON HITS TO SITE VIA ANALOG

CLT.REP> STATS ON ALL DOMAINS AND MONTHLY BILLING REP

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/ZA 99/00140

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 H04L12/24 H04L12/26

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)

IPC 7 H04L

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

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

EPO-Internal, WPI Data, PAJ, IBM-TDB, INSPEC, COMPENDEX

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 03, 31 March 1999 (1999-03-31) & JP 10 322333 A (HEWLETT PACKARD CO &LT;HP&GT;), 4 December 1998 (1998-12-04)	1,2,4,5
A	abstract	3
P,X	EP 0 883 271 A (HEWLETT PACKARD CO) 9 December 1998 (1998-12-09) abstract column 1, line 36-46 column 3, line 20-31 column 5, line 22 -column 7, line 25 column 11, line 13-29 column 14, line 19-27 figures 3,5,8,11	1,2,4,5

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

4 August 2000

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11/08/2000

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/ZA 99/00140

**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>ETERNO O ET AL: "AN INTRANET ENVIRONMENT TO SUPPORT OPERATION AND MAINTENANCE CENTERS"                      IEEE NETWORK OPERATIONS AND MANAGEMENT SYMPOSIUM, US, NEW YORK, NY: IEEE, vol. CONF. 10, 3 November 1997 (1997-11-03), pages 230-244, XP000799776                      ISBN: 0-7803-4352-2                      the whole document</p> <p style="text-align: center;">-----</p>	1-5

# INTERNATIONAL SEARCH REPORT

...formation on patent family members

International Application No

PCT/ZA 99/00140

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