

Omega Unified Messaging Server
Version 3.7

Hark Technologies

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Chapter 1

Introduction

1.1 Conventions used in this manual

- Names of keys are shown in `<>`. For example, `<TAB>`, `<ENTER>`, `<SHIFT>`, and `<CTRL>`.
- Certain actions require the simultaneous use of multiple key strokes. For example, `<CTRL>+<A>` means that you must hold down the Control key while you press the A key.
- Certain functions are to be performed from the command line. The command to be types will be displayed in the Courier font. For example, type `cat /etc/hosts`, means to type 'cat /etc/hosts' from the command line.
- Some programs such as `rtview` require cursor navigation. This is performed with the arrow keys. Up arrow will go up a line, and down arrow will go down one line. If there are more ports defined than can fit on the screen, the Page Up and Page Down keys can be used to go a page up and a page down respectively. Also the Home and End keys can be used to go to the first entry on the screen and the last entry on the screen respectively.
- Any time you see a line ending with `\`, it is a continuation line. You may see these in a configuration file listing. It means that the line should be entered as a complete line without pressing `<ENTER>` between the lines. There may be more than one line ending with `\` if the line is very long.

1.2 Functional Overview

Omega consists of a combination of hardware and software uniquely designed to work in conjunction with a paging system to emulate the functions provided by a Internet paging gateway, TAP concentrator, and TNPP router.

In addition, the several beneficial applications are provided, but are not limited to the following:

- Provides a password protected World Wide Web interface for subscribers to maintain certain configuration settings such as their passcode, and enabling/disabling their pager.
- Provides an administrative web interface for the service provider to setup system configuration and subscriber information.
- Computer interface supports use of a separate billing system to setup subscribers automatically.
- Delivery of voice, fax, numeric, alpha, or e-mail messages to an Internet e-mail address, and vice-versa.

Advanced features allow you to define when a particular pager will be paged, depending upon the day of the week, the time, message type, and urgency of the message. For example, you may only want a particular pager to be paged on Saturday and Sunday only if it is a numeric message marked urgent. All other messages are to be routed to a second pager.

You may also specify how frequently a page will be resent if the individual does not answer the first page. For example, if a particular on-call technician does not answer the first page, you can specify that two additional pages will be resent 15 minutes apart. If the individual does not login and listen to the message after the third page attempt, then the next pager on the list will be tried three times, at, for example, five minutes apart.

The above features are programmed using the mbpage feature that is discussed in detail later within this manual.

1.3 Features and Benefits

- Supports Numeric and Alphanumeric messages.
- Provides ability to specify a future delivery time for a message.
- Customizable retention times for numeric and alphanumeric messages.
- Customizable time limits for messages.
- Private security codes for each mailbox.
- Multiple paging devices per mailbox (up to 65,535).

- Specify start and end times per pager.
- Route only urgent or all messages to a particular pager.
- Specify number of tries and interval between paging attempts for each pager.
- Supports paging via SMTP (Internet e-mail), SNPP (Internet network paging), HTTP (Web paging), AIM (AOL Instant Messenger), TAP (Telocator Alphanumeric Protocol), TNPP (Telocator Network Paging Protocol - ID or CAP page), WCTP (Wireless Communications Transfer Protocol), and SMPP (Short Message Peer to Peer).
- Supports paging via dialup modem, dedicated RS232, and TCP/IP (Internet) connections. Backup all alphanumeric and numeric messages to one or more Internet e-mail addresses per mailbox.
- Send an e-mail to a pager.
- Copy all messages from one mailbox to another.
- Cascade messages for a mailbox to another after all paging attempts have been made.
- Forward messages to another mailbox if user is not available.
- Accepts incoming alpha pages via TAP, TNPP, HTTP, SMTP, SNPP, and WCTP.
- Computer interface for setting up mailboxes, pagers, and trees from a billing or accounting system.
- Delivery of numeric, alphanumeric, and e-mail messages to an Internet e-mail account, or accept these message types from the Internet.
- Web interface for sending text messages to pagers
- Web interface allows message viewing and maintenance of subscriber information.

1.4 Support Services

If you have any questions about the Omega, please refer to this manual first.

The support email address listed in the beginning of this manual is the best way to contact us for non-emergency technical support.

If you cannot find the answer, contact technical support at the following numbers. High quality, responsive technical support is available 24 hours a day, 7 days a week, including holidays.

For technical support between the hours of 8:00 AM and 4:30 PM Eastern Time, Monday through Friday, excluding holidays, call 843-821-6888. For technical support outside of normal business hours or on holidays, call 843-821-6888. The voice mail operator will answer your call. This number allows you to leave a message for normal business matters, or initiate a page for immediate technical support. The voice mail attendant will lead you through the appropriate procedures. For matters that do not require an urgent response, leave a voice mail message within the general mailbox.

For urgent matters that require that you speak to an on-call technician, select the appropriate key identifying the product for which you need technical support. After the technician's greeting, leave a short message with the area code and phone number at which you can be reached. The on-call technician will be paged and will return your call.

Phone: 843-821-6888

Fax: 843-821-6894

Web: <http://harktech.com>

Sales email: sales@harktech.com

Support email: support@harktech.com

Chapter 2

Installation

2.1 System Requirements

The following equipment represents the minimum configuration for a base 32 port system.

- Pentium III 500 or higher computer with 512Meg RAM and 18.2 Gig Ultra-2 SCSI hard drive or better
- One Ethernet card (used to connect to the Internet)
- CD-RW drive or tape drive for backups
- Edgeport USB serial hub. USB serial ports are used so that additional ports can be added without having to shutdown the system and add additional boards in the computer.
- Fulltime (dedicated) internet connection with static IP address and internet domain name setup with MX record for email services. Dialup connections to internet are not supported. **

The above configuration will support up to 64 serial ports and 96 telephony ports. To support more than 64 ports, add 32 Meg of RAM for each 16 ports over 64. You can never have too much memory. It is a small part of the cost of a system and you won't have to worry about adding more memory for future expansion.

* Ultra-2 (or newer) SCSI hard drives are required for several reasons. If you wish to have redundant drives either through disk mirroring or using a RAID 5 system, SCSI supports hot swapping the drives while the system is running. IDE hard drives are supported and can be used however if a drive fails the system will have to be taken down to replace a failed drive. When IDE drives fail, they can also load the

IDE bus, crashing the system. Another disadvantage is that IDE drives use more CPU resources than a SCSI system. For non-redundant systems, an Adaptec AHA-2940U2 is recommended. For mirrored or RAID 5 systems, the Adaptec ASR-2100S is used.

Note: Seagate SATA drives are now also a good choice as they typically have the same warranty as their SCSI drives.

** It is difficult to judge how much bandwidth you will need initially. We suggest that you allow yourself the option to upgrade your Internet connection without penalty from your Internet Service Provider (ISP). For SMTP and SNPP, a 56k leased line is more than adequate for thousands of subscribers. Omega is designed to handle up to 96 simultaneous SMTP connections and 96 SNPP connections at the same time. These sessions are normally very short, so a large amount of traffic can be handled with the base system. However, adding the Web services can dramatically increase the amount of bandwidth required. If only Web-based paging is offered, the base 56k can handle the additional traffic without a problem. However, the 56k may not suffice if the Web-based database maintenance and message handling is used. There are several options available now, the most reliable being a dedicated leased line. However, SDSL will probably suit most businesses just fine. Internet connectivity can usually be purchased in increments of 64K. This is usually done with a fractional T1 connection. For example, you can start with 128K and upgrade to 256K or all the way to a full T1 at 1.544 Mbps.

Operating Systems supported:

- Microsoft Windows 2000 Professional Operating System (OS) with Service Pack 3 or higher
- Microsoft Windows XP Professional
- Microsoft Windows 2003 Server
- Centos Linux 4.5

2.2 Hardware

The system may arrive in multiple boxes depending on the options ordered. After unpacking the server, inspect for any hidden physical damage. This should include opening the computer case and inspecting for any parts that may have worked loose during shipping. After inspecting all the equipment, start by mounting the server and any rack-mount accessories in your rack. The computer chassis was selected so that it can be mounting using only its front ears if you wish. You may also

use slide rails if your application requires it. Connect the power cables, keyboard, video, and network cables. A mouse isn't required for operation, but one is included.

Clustered systems will include a second server and cables to connect the two computers together. After mounting the second server connect the included null modem serial cable between the serial ports on the back of the two computers. Also connect the included cross-over ethernet cable between eth1 on both computers. Eth1 is the ethernet connector to the right when looking at the back of the computer. Clustered systems also include a rack-mount KVM (Keyboard-Video-Mouse) switch box to switch the video and keyboard between the two clustered systems. See the "Cluster" chapter for more information.

2.3 Operating System

The Omega supports Windows 2000, Windows XP Professional, Windows 2003 Server and Linux. Turnkey systems will already have the operating system and application software installed. However, software only systems will need to have the operating system installed and setup. Both configurations will need to have a few settings customized for your particular installation. Some configurations may not be available in all operating systems.

2.3.1 Windows 2000/XP/2003

Install operating system per Microsoft instructions. Create a 10-15 Gig partition for the C drive. Windows doesn't really need anywhere near this much, but with the size of hard drives it isn't worth having to worry about changing the size later. Create a second partition for the Omega application. This will typically be about 60-65Gig for an 80Gig hard drive. Depending on the version of Windows you are using this additional partition may be d: or e: or some other drive letter. This manual will use d:, please replace with the appropriate drive letter for your installation.

Once Windows is installed install the Omega following the instructions included separately.

To make a couple of routine operations easier create a shortcut on the Desktop to `d:\omega\bin>ShowStats.exe` . This is the real-time statistics viewer. Also create a shortcut to the Windows command prompt. This shortcut is `c:\windows\system32\cmd.exe` . On Windows 2000 replace windows with winnt. Right-click on the cmd.exe shortcut icon on the desktop and click properties. Click on the Shortcut tab and change Start in: to `d:\omega` . Next click on the Layout tab and set Screen buffer size height to 1000, Window size Height to 43, uncheck Let system position window and set Left to 100 and Top to 0.

For ease of troubleshooting and remote access using SSH over a command line network connection we recommend that Cygwin is installed. Please go to <http://cygwin.com> to download and install cygwin. Follow the installation prompts. Once you get to package selection make sure that the following are set to install:

```
Admin -> cygrunsrv
Archive -> zip
Archive -> unzip
Editors -> vim
Net -> openssh
Text -> less
```

Run `ssh-host-config` to configure the SSH server. Make sure port 22 is open in your firewall to allow incoming SSH connections. A Windows SSH client is available here: <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>

2.3.2 Linux

Centos Linux 4.2 or greater is used for the Linux-based Omegas. This can be downloaded from <http://www.centos.org>. Software only Linux-based Omegas will include the Centos install CD so it is not necessary to obtain it on your own.

Make sure that you have a keyboard, mouse and monitor plugged into your server. Also an ethernet cable would be a good idea, but not necessary at this point. The following procedure will guide you through the Linux Operating System installation.

- Power on the computer and make sure that your BIOS settings are set to boot from CD before the hard drive.
- Insert the Linux System Installation CD.
- Boot the computer. You will see a Centos 4 screen with the following:

```
[F1 - Main] [F2 - Options] [F3 - General] [F4 - Kernel] [F5 - Rescue]
boot:
```

- At the boot prompt press `<ENTER>` to install. At this point you will see a bunch of text scrolling on the screen.
- Next a text window asking if you would like to check the media appears. The media is tested before it is shipped, but if you want to make sure you can press `<ENTER>` to check the media. Or just press `<RIGHTARROW>` and press `<ENTER>` on Skip.

- Next you will see a few more lines of text, then the graphical installer will startup.
- Click Next
- You should see a language selection. Click Next to select the default of English. Otherwise select your language and click Next.

Note: Hark can only support English installations
- Another language selection. This time the default is U.S. English. Click Next.
- You should now see the disk partitioning screen. Select the “Manually partition with Disk Druid” radio button and click Next.
- If this is a new hard drive, you may see a popup window that says “The partition table on device sda was unreadable. To create new partitions it must be initialized, causing the losof ALL DATA on this device.” ... “Would you like to initialize this drive, erasing ALL DATA?”. Click Yes.
- You should now be in Disk Druid. Click New to create a new partition.
- You should now see the “Add partition” window.
- Set the mount point to /boot. Check the “Force to be a primary partition” checkbox. Click OK.
- Click New to add another partition.
- Set the mount point to /. Set the size to 5000. Check the “Force to be a primary partition” checkbox. Click OK.
- Click New to add another partition.
- Set the filesystem type to swap. Set the size to 2048. Check the “Force to be a primary partition” checkbox. Click OK.
- Click New to add another partition.
- Set the mount point to /var. Set the size to 10000. Click OK.
- Click New to add another partition.
- Set the mount point to /opt. Set the size to 50000. Click OK.
- Click New to add another partition.
- Set the mount point to /var/opt. Check the “Fill to maximum allowable size” checkbox. Click OK.
- Click Next
- You should now see a screen with “The GRUB boot loader will be installed on /dev/sda”. You don’t need to change anything here. Just click Next.

- Now you will see the Network Devices setup.
- If you are using DHCP click next, otherwise click Edit and change the IP settings. Make sure “Activate on boot” is checked. If you are unsure at this point, leave it set to DHCP. This can always be changed later. Hostname should be set manually. Pick a unique hostname in your domain. For example, tnpplx.yourdomainname.com.
- Click Next
- Leave “Enable Firewall” checked. Check “ssh” to allow encrypted shell access from remote locations. Change “Enable SELinux” to Disabled.
- Click Next
- “Select the default language for the system” and click Next.
- Select the appropriate timezone and click Next.
- Enter a password for the root user. You will need to enter it twice. The password will not show on the screen. Make a note of this password. You will need it to login later. Click Next to continue.
- Check the “Customize software packages to install radio button” and click Next.
- Scroll to the bottom and check “Minimal” to install the minimal set of packages and click Next.
- Click Next again.
- Next you should see a few popup windows stating that the system is formatting the various filesystems previously setup. Then the system will transfer the install image to the hard drive and prepare RPM transaction.
- Next you should see a progress bar with package names listed below it. The names will probably go by fairly quickly. This step only takes a few minutes on a relatively fast computer (2.4GHz Pentium 4).
- Next you will see “Performing post install configuration” and “Installing boot loader”.
- When you see “Congratulations, the installation is complete” the CD will automatically eject. Remove the CD from the drive and close the CD drive.
- Click Reboot to reboot the computer.

Now that the system has been installed and rebooted you will see a lot of text messages display on the screen. Most of them won't mean anything to you. Ignore any errors about the “Intel Microcode Update”. Not all Intel processors have a microcode update to install.

At the login prompt login as **root** using the password you entered earlier.

Now we are going to install the current operating system updates.

- Type `yum update` to download the latest update headers and ask if you wish to perform the update.

2.4 System servers

2.4.1 Windows

The Omega does not use any of the Windows system servers such as IIS or Exchange.

Apache

The Omega now uses the Apache web server as a reverse proxy to support SSL encryption for incoming HTTP and WCTP sessions.

Download Apache 2.2.11 for Windows from here <http://www.hightechimpact.com/Apache/httpd/win32-x86-openssl-0.9.8i.msi> Install Apache in the `d:\apache` directory (replace `d:` with the proper drive letter for your Omega installation partition).

Copy the `zz-omega.conf` file to the `d:\apache\conf\extra` directory. Next edit the `d:\apache\conf\httpd.conf` file and add the following line in the Supplemental configuration section:

```
Include conf/extra/zz-omega.conf
```

You will need to edit the `zz-omega.conf` file and change all references of `omega3.harktech.com` to your fully qualified domain name. Leave all references to `localhost` alone, but make sure the port number after `localhost` matches the port number you have defined for the `http` and `wctp` servers.

In order to support SSL a certificate will need to be created. See the separate instructions for this procedure. Once the certificate is received put the certificate in a file called `server.crt` in the `apache conf` directory. The server key you originally generated should be `server.pem` in the `apache conf` directory. You will want to create a passphrase-less version of this so you won't need to type it in every time you start the Apache web server.

The following is the default contents of the `zz-omega.conf` file:

```
# Replace omega3.harktech.com with the name you are publishing for
# your customer access

# Remove /etc/httpd/conf.d/ssl.conf so the settings below will be
# used instead

# uncomment to enable SSL
#LoadModule ssl_module modules/mod_ssl.so

# enable reverse proxy support
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_http_module modules/mod_proxy_http.so

<IfModule mod_ssl.c>
    Listen 443
    AddType application/x-x509-ca-cert .crt
    AddType application/x-pkcs7-crl .crl
    SSLPassPhraseDialog builtin
    SSLSessionCacheTimeout 300
    SSLMutex default
### Linux
# SSLSessionCache          shmcb:/var/cache/mod_ssl/scache(512000)
# SSLRandomSeed startup file:/dev/urandom 256
# SSLRandomSeed connect builtin
# SSLCryptoDevice builtin
# SSLCertificateFile       /etc/httpd/conf/server.crt
# SSLCertificateKeyFile    /etc/httpd/conf/server.pem
### End Linux
### Windows
    SSLSessionCache          shmcb:e:/apache/logs/mod_ssl/scache(512000)
    SSLCertificateFile       e:/apache/conf/server.crt
    SSLCertificateKeyFile    e:/apache/conf/server.pem
### End Windows
    SetEnvIf User-Agent ".*MSIE.*" nokeepalive ssl-unclean-shutdown downgrade-1.0 force-
</IfModule>

<IfModule mod_proxy.c>
# Do not allow forward proxy
    ProxyRequests Off

# Enable proxy for all client connections
# Need to enable for reverse proxy
    <Proxy *>
        Order deny,allow
        Allow from all
    </Proxy>
```

```
</IfModule>
```

```
NameVirtualHost *:80
```

```
<VirtualHost *:80>
```

```
    ServerName omega3.harktech.com
    ProxyPass /wctp http://localhost:20081/wctp
    ProxyPass / http://localhost:20080/
    ProxyPassReverse /wctp http://omega3.harktech.com/wctp
    ProxyPassReverse / http://omega3.harktech.com/
    ErrorLog logs/omega_error_log
    CustomLog logs/omega_access_log combined
```

```
</VirtualHost>
```

```
<IfModule mod_ssl.c>
```

```
<VirtualHost _default_:443>
```

```
    ServerName omega3.harktech.com
    SSLEngine on
#   SSLProtocol all -SSLv2
    SSLCipherSuite ALL:!ADH:!EXPORT:!SSLv2:RC4+RSA:+HIGH:+MEDIUM:+LOW
    CustomLog logs/ssl_request_log "%t %h %{SSL_PROTOCOL}x %{SSL_CIPHER}x \"%r\" %b"
    ProxyPass /wctp http://localhost:20081/wctp
    ProxyPass / http://localhost:20080/
    ProxyPassReverse /wctp https://omega3.harktech.com/wctp
    ProxyPassReverse / https://omega3.harktech.com/
    ErrorLog logs/omega_s_error_log
    CustomLog logs/omega_s_access_log combined
```

```
</VirtualHost>
```

```
</IfModule>
```

2.4.2 Linux

The Linux-based Omega can use the Postfix and Apache servers in Linux to provide enhanced services. For example, using Postfix and Spamassassin to reduce the amount of spam or using the Apache web server to provide SLL support for HTTP or WCTP.

Apache

The Omega installation program automatically creates a file called `zz_omega.conf` in the `/etc/httpd/conf.d` directory. This file contains the base configuration needed to use Apache for the main web server. You will need to edit this file after installation and change all references of `omega.harktech.com` to your fully qualified domain name. Leave all references to `localhost` alone, but make sure the port number after `localhost` matches the port number you have defined for the `http` and `wctp` servers.

The following is the default contents of the `zz-omega.conf` file:

```
# Replace omega3.harktech.com with the name you are publishing for
# your customer access

# Remove /etc/httpd/conf.d/ssl.conf so the settings below will be
# used instead

# uncomment to enable SSL
#LoadModule ssl_module modules/mod_ssl.so

# enable reverse proxy support
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_http_module modules/mod_proxy_http.so

<IfModule mod_ssl.c>
    Listen 443
    AddType application/x-x509-ca-cert .crt
    AddType application/x-pkcs7-crl .crl
    SSLPassPhraseDialog builtin
    SSLSessionCacheTimeout 300
    SSLMutex default
### Linux
    SSLSessionCache          shmcb:/var/cache/mod_ssl/scache(512000)
    SSLRandomSeed startup file:/dev/urandom 256
    SSLRandomSeed connect builtin
    SSLCryptoDevice builtin
    SSLCertificateFile       /etc/httpd/conf/server.crt
    SSLCertificateKeyFile    /etc/httpd/conf/server.pem
### End Linux
### Windows
# SSLSessionCache          shmcb:e:/apache/logs/mod_ssl/scache(512000)
# SSLCertificateFile       e:/apache/conf/server.crt
# SSLCertificateKeyFile    e:/apache/conf/server.pem
### End Windows
    SetEnvIf User-Agent ".*MSIE.*" nokeepalive ssl-unclean-shutdown downgrade-1.0 force-
</IfModule>

<IfModule mod_proxy.c>
# Do not allow forward proxy
    ProxyRequests Off

# Enable proxy for all client connections
# Need to enable for reverse proxy
```



```

    <Proxy *>
        Order deny,allow
        Allow from all
    </Proxy>
</IfModule>

NameVirtualHost *:80

<VirtualHost *:80>
    ServerName omega3.harktech.com
    ProxyPass /wctp http://localhost:20081/wctp
    ProxyPass / http://localhost:20080/
    ProxyPassReverse /wctp http://omega3.harktech.com/wctp
    ProxyPassReverse / http://omega3.harktech.com/
    ErrorLog logs/omega_error_log
    CustomLog logs/omega_access_log combined
</VirtualHost>

<IfModule mod_ssl.c>
<VirtualHost _default_:443>
    ServerName omega3.harktech.com
    SSLEngine on
#   SSLProtocol all -SSLv2
    SSLCipherSuite ALL:!ADH:!EXPORT:!SSLv2:RC4+RSA:+HIGH:+MEDIUM:+LOW
    CustomLog logs/ssl_request_log "%t %h %{SSL_PROTOCOL}x %{SSL_CIPHER}x \"%r\" %b"
    ProxyPass /wctp http://localhost:20081/wctp
    ProxyPass / http://localhost:20080/
    ProxyPassReverse /wctp https://omega3.harktech.com/wctp
    ProxyPassReverse / https://omega3.harktech.com/
    ErrorLog logs/omega_s_error_log
    CustomLog logs/omega_s_access_log combined
</VirtualHost>
</IfModule>

```

DNS

The built-in Linux DNS server should be configured to cache DNS.

Postfix

Change `inet_interfaces` in `/etc/postfix/main.cf` to allow incoming email from the network interface. This is typically done with one of the following:

```

inet_interfaces = $myhostname
inet_interfaces = 10.10.10.1
inet_interfaces = all

```

`$myhostname` is used if the IP address for the interface you wish to listen on is defined in the `/etc/hosts` file or in DNS. An actual IP address may be used (e.g. 10.10.10.1 above) if the hostname does not appear in `/etc/hosts` or DNS. The keyword `all` may be used to allow incoming SMTP connections on all network interfaces.

Also add the following to the end of the `/etc/postfix/main.cf` file:

```
transport_maps = hash:/etc/postfix/transport
```

Edit the `/etc/postfix/transport` file and append the following line to the end of the file:

```
pager.example.com      smtp:[127.0.0.1]:20025
```

Replace the `pager.example.com` with the domain name your subscribers send email. The `[127.0.0.1]` tells postfix to forward all email for the specified domain to this IP address (in this case localhost). The `:20025` specifies the port number that the Omega email server is listening on.

Once the transport file has been saved, type `postmap transport` to compile it. Then restart the postfix server with `service postfix restart`.

2.5 Application

The Omega consists of several applications working together to accept messages and forward them to their proper destination.

After the initial setup, the following steps need to be performed to install the Omega software. Configurations for the HTTP, POP3, SMTP, SNPP, and Statistics servers are already set in `omega.ini`. All that is needed is to enable them in the `[vmstart]` section by uncommenting their respective line.

Copy the files from the CD to the `\omega` directory on the partition you are using for the Omega. A pdf copy of the documentation is in the `docs` directory.

Set the `LICENSE_KEY` in the `omega.ini` file to 0 to run in demo mode. The server will run for one hour in demo mode then shut down. It will not allow the application

to startup for 15 minutes. After that you can start it again for another hour. You can run the application as many times as you want.

You may register your system for demo mode using the harkregister program. The harkregister program will connect to our secure server and check to see if there is a valid license for the server. If there is the license key and feature key will be downloaded and installed in the omega.ini file. Otherwise the system will prompt you for company and contact information and allow the system to run in demo mode.

2.5.1 devices

The telephony ports are typically already setup for you. Some customization may be required to change wink start ports to immediate and other protocol options.

Define any serial ports you need to setup. TAP ports can be either an input or an output. TNPP ports are typically bidirectional, but simplex ports are supported. Setup device entries for these serial ports.

All of the TCP/IP servers are configured in omega.ini. httpd, pop3d, smtpd, snppd, SysPage, and vmci all have the port they listen on defined in omega.ini. The default settings are appropriate for most cases.

2.5.2 Output groups

In order to support outgoing message notification, output groups will need to be created. Output groups allow devices to be grouped so if one is busy another output will be selected. This is most used for having a pool of outdial modems to call remote paging carriers TAP modems. Typically, TCP/IP ports will have an outgrp consisting of only one device. TCP/IP inherently supports multiple connections over the same physical path.

2.5.3 Dialing types

Now that output groups are defined dialtype entries need to be created to define how the system needs to communicate with the remote device. A dialtype will have the output group and the information needed to format the message with the proper protocol to send to the remote system.

2.5.4 System alarms

System alarms can be setup to notify someone of a problem or potential problem. These alarms can be delivered via TAP, TNPP, SMTP, or SNPP. If you choose to deliver the alarms via TAP or TNPP a dedicated serial port must be used. This device can not be shared with any service provided to customers.

2.5.5 Features class of service

Each mailbox has a Features Class of Service (FCOS) assigned to it. This defines which features the mailbox can access, allowing you to customize services and charge for additional options, or limit the features available to subscribers.

2.5.6 Limits class of service

Each mailbox also has a Limits Class of Service (LCOS). This defines the maximum message counts and retention limits.

2.5.7 TNPP routes

If TNPP paging is to be used, routing entries need to be setup so the system can use the proper output device to deliver the packet. Any TNPP packet received which isn't for the local device or does not have a routing entry will be acknowledged and discarded.

2.5.8 TNPP filters

Setup any necessary rules to block unwanted TNPP packets. Filters can be based on Cap code for cap packets, ID for ID packets, TNPP source, TNPP destination, pager type, or pager encoding format.

2.5.9 IP filters

Define a list of IP addresses to block connections from. Group related IP address together in the same group. Each server program can use a different group to block. For example smtpd can be set to filter number 1 and block all the IP addresses in it, while snppd can be set to filter number 2 and block all those IP addresses. IP addresses may belong to more than one group and all the server programs can use the same group if desired.

2.5.10 DNS blacklist

There are several DNS-based anti-spam servers available. Some charge a fee such as MAPS (now owned by Trend Micro <http://www.trendmicro.com/services/rbl/>), and some are free like <http://ordb.org/> and <http://www.spamhaus.org/>. Multiple servers can be specified and each incoming connection will be checked against all enabled servers in this database.

2.5.11 ID blocks

ID blocks are used to setup blocks of numbers that are handled the same way. All subscribers in a block must have the same type of message delivery. In the case of an incoming ID belonging to more than one block, the smallest block of numbers that includes the ID will be used. If more than one block includes the ID and are the same size the first block found will be used. If a subscriber needs to access their messages over the web, or needs a copy sent to more than one device (ie. pager and email), a subscriber record will need to be setup for them. A subscriber record will override any block programming, so you don't need to worry about removing the number from the block.

2.5.12 Account

Mailboxes can be grouped into accounts. This allows resellers access to their own accounts using the web based administration without allowing them to see other subscribers. There is also a features which allows the system operator to specify that a subscriber can only send/forward messages from their mailbox to another mailbox with the same account number.

2.5.13 User

Users are typically your employess that you wish to have access to the web-based administration pages. In order to access the administrative web pages, a user will need to be setup. This applies to resellers also. This table is also used for alpha transcription. Each person authorized to transcribe alpha messages should be added. There are security levels which allow the system operator to restrict access to just subscriber maintenance, view stats only, or access to system programming databases.

2.5.14 mailbox

If your subscribers don't need any special features or message retention, you can probably get by with just creating ID blocks to define how incoming messages are handled. Each ID block can specify a different dialtype. For message retention and customized notification, a mailbox will need to be setup for the subscriber.

Subscribers with mailboxes will be allowed to view their messages and change certain settings using any standard web browser. They will also have the ability to have multiple pagers, so they can receive a page over their local pager and have a copy go to their email or AOL instant messenger account.

For subscribers with mailboxes mbpage entries will need to be setup in order to be notified when a message is received.

2.5.15 Anti-spam

Several methods of spam prevention have been implemented.

- ipfilt IP address blocking
- DNS-based block lists
- Throttling by IP address
- Throttling by sender email
- Throttling by first 80 characters of message
- Maximum recipients allowed per session
- Maximum sequential recipients allowed per session
- Don't accept email older than a specified date/time
- Don't accept email newer than a specified date/time
- Delay initial 220 response by 1 to 28 seconds

The following methods are currently being implemented and will be available in the future.

- Require Fully-Qualified Domain Name (FQDN) in HELO/EHLO (future)
- Make sure FQDN in HELO prompt exists in DNS (future)

IP addresses can be blocked from accessing any TCP/IP service using ipfilt. Each TCP/IP device, such as SMTP or SNPP, can have an individual (or common) IP Filter assigned to it (see section 5.4.17). Incoming packets can be blocked based on the entries in the ipfilt table for this IP Filter. For more information see section 5.10.

The `dnsbl` table is used to specify which DNS based blocklists to check. See section 5.11 for more information.

Multiple messages from the same source can be throttled. This has been integrated with the IP filtering, so now different sources can have different configurable limits. It is now possible to have different limits based on the internet server being used. This is because each device can have an IP filter defined, and each IP filter can have different IP address patterns and blocking rules. Having this configurable per IP address is useful if you want to limit outside connections, but never want to refuse a connection from an internal server (such as email).

There are also global settings which can limit the number of messages sent in a single connection and a separate global setting for limiting the number of sequential pager Ids in a single connection. These are `MAX_RECIPIENTS` and `MAX_SEQUENTIAL` in the `[smtpd]` section of `omega.ini`.

We are always looking for ways to improve spam blocking as spam seems to be only getting worse.

2.5.16 Additional information

Please refer to the appropriate section for more information on the details of setting up the needed database entries.

2.6 Exiting the application

Perform the following to stop processing calls and stop the Omega service.

- Right click on My Computer
- Click on Manage
- Click on the + next to “Services and Applications”
- Click on Services
- Right click Hark Omega
- Click on Stop

Or alternatively from a command line (or from Start->Run) type the following:

- `net stop omega`

It isn't necessary to stop the Omega service before shutting down or rebooting Windows. To completely shutdown the system, select the Start button displayed at the bottom of your Desktop. Select the Shut Down option. Select Shutdown (or Restart) and click the OK button.

2.6.1 Logging out

Perform the following to log out.

- Select the Start button displayed at the bottom of your Desktop.
- Select the Shutdown option from the resulting menu.
- Select the Close all programs and logon as a different user bullet and click the OK button.

Note: logging off does not stop call processing. The system will continue to accept and process calls while logged out.

You now have the option to log in as a different user or to shutdown the Omega application. Refer to Section 2.4 for details.

Chapter 3

Clustering

3.1 Background

The Omega can be configured to support clustering. This option must be specified at the time of order and can not be added later. Clustering is the ability for a standby server to automatically take over in the event of a failure on the primary system.

This is currently only supported on Linux.

In order to do this a couple of things needs to be handled. First, because this is an unattended fail-over the serial ports can not be directly connected to the Omega. For this reason Control DeviceMaster RTS 1U rack-mount serial servers are used. These devices are connected using a 10/100baseT connection to an ethernet switch. The Omega then connects to the serial server and access the com ports as if they are on the server itself. Second, the hard drive storage needs to be synchronized so when the server switches over to the backup it has all the information available as of the moment of switchover. This is done using a network block device. Think of this as network RAID-1 (disk mirroring over a network). Due to the potentially large volume of data the network block device communicates over its own dedicated gigabit ethernet link (eth1). Finally, a heartbeat between the two machines is needed so the server can tell which one it is supposed to be running on. In order to minimize any single points of failure, there are actually two heartbeats running. One is over a serial cable connecting the serial ports on the back of the two Omega servers. The second is over the dedicated private ethernet running on eth1.

3.2 Hardware configuration

The clustering system uses two identical computers with dual gigabit ethernet network ports. Ethernet port 0 (eth0) is setup to connect to your network. By default

it uses DHCP however this can be changed by following the instructions in the “Network settings” section. Ethernet port 1 (eth1) is used for the network disk mirroring and for a backup heartbeat. The primary heartbeat is through the serial port on the back of each computer in the cluster. These two serial ports are connected with the supplied null modem cable.

Clustered systems also include a rack-mount KVM switch to allow the use of a single keyboard and monitor.

3.3 Setup

This section describes the clustering setup files. Most of these are already set prior to shipping, but some customization may be required for customer specific installations.

3.3.1 Heartbeat configuration

Heartbeat is the system service responsible for detecting when there is a failure and switching the services to the standby server. The heartbeat configuration is in the `/etc/ha.d` directory. In this directory, the `ha.cf` file is the main heartbeat configuration file. The following is an example:

```
logfacility local0
baud 19200
serial /dev/ttyS0
bcast eth1
auto_failback on
node omega1.harktech.com
node omega2.harktech.com
ping 10.100.1.253
respawn hacluster /usr/lib/heartbeat/ipfail
```

The important options above are the serial port and baud rate. The serial port on the back of the Omega is `/dev/ttyS0`. The baud rate must match on both servers. The `bcast eth1` means that the heartbeat will also be broadcast on `eth1` in case the serial cable is unplugged or there is some other failure. The `auto_failback` feature will automatically move the services back to the primary server once the heartbeat detects that it is operational again. There are two node listings, one for each server. They must contain the Fully-Qualified Internet Host Name. Ping is used to ping a known server or router and will be used to determine if the server still has network connectivity. Multiple IP addresses may be specified to minimize false positives in case the remote server is unavailable due to maintenance or some other reason. This IP address should not be the IP address of the other server in the cluster. The `respawn` line is required in order to ping the remote and detect network failures.

The next important configuration file is `haresources`. This specifies the primary server and the resources to stop/start on fail-over. The following is an example:

```
omega1.harktech.com 10.100.1.252/eth0 drbddisk::r0 \  
Filesystem::/dev/drbd0::/opt/omega::ext3 nslink syspage vmstart
```

The first part is the fully-qualified host name of the primary server. Next is the IP address resource we are going to use externally. This will be the IP address that the remote connects to. It may be an internal IP address if you are NATing an external IP address to it. This IP address will be moved to the active server in a fail-over condition. It is not the main IP address bound to the ethernet adapter of either server in the cluster. Next `drbddisk::r0` specifies that the `drbddisk` resource 0 is a required component. See the “Drbd configuration” section for more information on `drbd`. This is followed by `Filesystem::/dev/drbd0::/opt/omega::ext3`. `Filesystem` indicates that heartbeat is to move the filesystem between servers in a fail-over condition. The `::` separate the arguments for the component. `/dev/drbd0` is the network block device which is mounted at `/opt/omega` which is the main directory for the Omega using the `ext3` file system type. Finally we have `which` which is the main service for the Omega which handles starting and monitoring the individual processes.

3.3.2 Drbd configuration

`Drbd` is the network disk mirroring. It is responsible for making sure that all of the disk writes are copied to the standby server so it will be up-to-date in case of fail-over. The network block device configuration is in `/etc/drbd.conf`. The following is an example configuration file:

```
resource r0 {  
    protocol C;  
    incon-degr-cmd "echo '!DRBD! pri on incon-degr' | wall ; \  
sleep 60 ; halt -f";  
  
    startup {  
        wfc-timeout          5;  ## 0=Infinite  
        degr-wfc-timeout    120; ## 2 minutes.  
    }  
  
    disk {  
        on-io-error detach;  
    }  
  
    net {  
        # timeout          60;  
        # connect-int      10;
```

```

# ping-int          10;
# max-buffers       2048;
# max-epoch-size    2048;
}

syncer {
  rate 4M;
  group 1; # sync concurrently with r0
}

on omega1.harktech.com {
  device /dev/drbd0;
  disk /dev/sda6;
  address 10.0.0.1:7789;
  meta-disk internal;
}

on omega2.harktech.com {
  device /dev/drbd0;
  disk /dev/sda6;
  address 10.0.0.2:7789;
  meta-disk internal;
}
}

```

The two **on** sections are the most likely to need customizing for an installation. They have the hostname, the device, disk, and address configuration. The address in the file above is the IP address on the dedicated gigabit ethernet link.

3.3.3 Control Devicemaster Serial Server

The Control serial server configuration is in `/etc/nslink.conf`. The following is an example file:

```

bootfile-DM /etc/devmast.bin

10.100.1.203 32 30
10.100.1.204 32 30

```

The `bootfile-DM` line is the firmware file to upload to the Devicemaster device. There is a line for each of the Devicemasters the Omega connects to. In this case there are two 32 port Devicemasters using a 30 second timeout. A connection check is sent to each serial server every `timeout/2` seconds. If more than `timeout` seconds

pass between receiving connection check responses, the link will timeout and any open ports on that serial server will report errors. A value of 0 disables the link timeout.

Chapter 4

Configuration

4.1 `omega.ini`

This is the main configuration file for all Omega programs. It is structured like a Microsoft Windows ini file. There is a common section which applies to all programs and a section for each Omega program. Refer to the “Program Descriptions” chapter for more information on the programs referred to in this section.

All field values will automatically have any trailing spaces or tabs trimmed except for the `EMAIL_PREFIX...` fields. These fields allow trailing spaces so make sure there are only the number of spaces you want after the field value.

4.1.1 [Common]

Common settings for all programs.

MBDIR_FORMAT

Format to use for the mailbox message directory. This is the vm sub-directory in the omega installation directory. Setting this value to 0 or NONE will use the entire mailbox number for the sub-directory under vm to store the mailbox messages. This field can also be set to 1 or NPA which will split the mailbox number into an npa directory, nxx directory, and a number. The message directory for 8435551212, for example, would be vm/843/555/1212. If the mailbox number only has 7 digits the message directory would be vm/000/555/1212. The MBDIR_FORMAT may also be set to 2 or NXX. This will split the mailbox number into npanxx/number. For example, with a 10 digit mailbox number, vm/843555/1212. A 7 digit mailbox would be vm/555/1212. In any case if the mailbox number is not 7 digits and not 10 digits, this setting is ignored and the mailbox will be stored as vm/nnnnn where nnnnn is a variable length mailbox number. For example, 55512 would be vm/55512 and 83484737487 would be vm/83484737487. Do not change this value while the system is running.

HELO_NAME

The fully qualified hostname to report in the outgoing SMTP HELO message.

MASQUERADE_AS

Fully qualified host name to masquerade as when sending email. For example, if your domain name was example.com and your published hostname is pager.example.com, but the Omega's hostname is omega1.example.com. Enter pager.example.com for this field and all email will look like it came from pager.example.com not omega1.example.com.

SMARTER_HOST	The name of an outgoing SMTP server which can be used to send email to the Internet. This is used by the return emails from the SMPP two-way server.
LICENSE_KEY	Software license key. Do not change from the factory value or the Omega service will stop accepting any connections and will not restart until the proper license key is entered.
SYPAGE_PORT	The TCP port number of the syspage server. This value must match the LISTEN_PORT in the [settings] section of the syspage.ini file installed on the system. See the syspage docs for more information.
TIMEZONE_OFFSET	The time difference from GMT/UTC in hours and minutes. For example, Eastern Standard Time (EST) is -0500. This is used for the default value when creating new subscribers or idblocks.
DAYLIGHT_SAVING	Specifies the default daylight saving value to use when creating mailboxes and idblocks. Allowable values are Y or 1 for enabled, or N or 0 for disabled.
MAILBOX_CHECK_SOURCE	Enable message source checking. If enabled this will allow checking of the AllowSource field in the subscriber mailbox record.
LDAP_HOSTS	The LDAP server:port to lookup subscriber information.
LDAP_BASE	The base search DN. Typically in form of O=companyname, C=US
LDAP_BINDDN	The bind Distinguished Name (DN). For example, bwLoginName=paging.
LDAP_PASSWORD	The LDAP server password.

LDAP_FILTER	The LDAP search filter. See the example omega.ini for an example. A %i in the filter will substitute the incoming subscriber ID.
LDAP_VALIDATTR	The name of the LDAP attribute used to specify if the subscriber is valid or not.
LDAP_MAXLENATTR	The name of the LDAP attribute used to specify the maximum message length the subscriber is allowed.
LDAP_DIALTYPEATTR	The name of the LDAP attribute used to specify the dialtype to use for sending the message.
ID_FORWARD	Any messages received using the SMPP protocol to this ID will be forwarded to an email server for delivery as long as the SMARTER_HOST value is set to a valid mail server and the short message from the SMSC starts with a valid email address followed by a space then the short message.
REPLY_FORWARD	Any messages received using the SMPP protocol to this ID will be looked up in the mldata database for the original incoming message. If the original incoming message has an email address in the From field, that From field value will be used to send the reply email. This field also requires that SMARTER_HOST is set to a valid mail server. As of Omega version 3.2 we support setting the SMPP source address to a number followed by a set of random digits. For example, 6245%6r. This will set the source address for the outgoing SMPP message to 6245 and 6 random digits. This source address is then used when the handset replies to the email to lookup the original sender and forward the email reply to them. To support 6245 followed by 6 random digits, set this field to 6245..... . The six periods after the 6245 will be ignored when matching the ID. The length of this value must match the length of the source address used to send the message to the handset.

EMAIL_PREFIX_FROM	What to display on the outgoing message before sending the from data. The default value is 'From: '. Without quotes, notice the space after the colon (:).
EMAIL_PREFIX_TO	What to display on the outgoing message before sending the to data. The default value is 'To: '. Without quotes, notice the space after the colon (:).
EMAIL_PREFIX_SUBJECT	What to display on the outgoing message before sending the subject data. The default value is 'Subj: '. Without quotes, notice the space after the colon (:).
EMAIL_PREFIX_BODY	What to display on the outgoing message before sending the message data. The default value is 'Msg: '. Without quotes, notice the space after the colon (:).
DEBUG_LEVEL	Sets the amount of debugging information logged to the debug directory. The following is a list of the values for each type of information that can be logged. Add the values together for the value to set the DEBUG_LEVEL.

0	No debug
1	Logging (a lot of miscellaneous debug info)
2	Functions (log entering functions)
8	Queues
16	Semaphores
32	ComLib (log serial port calls and info)
64	NetLib (log network calls and info)
128	Read
256	Write
4096	Tap Library logging
8192	Tnpp Library logging
16384	Thread information
32768	Telephony switching
65536	Web page template parsing
131072	Log reads of zero bytes also (not recommended)
262144	Message data (may create extremely large files)
524288	Telephony dial tokens
1048576	bin2str
2097152	Modem capabilities
4194304	HTTP admin sessions (not recommended)
8388608	Database open/close
16777216	Parse line
33554432	Interprocess communication
67108864	Trim silence

LOG_PERIOD

The amount of time to write to a billing log file. This is typically set to DAILY to create a new billing log each day. Other allowable values are WEEKLY and MONTHLY. WEEKLY will create a new billing log every seven days of the month. At the end of the month a new weekly file will be created for the next month even if there are not exactly 28 days in a month. MONTHLY will create a new billing log each month. For compatibility with pre 3.6-13 installations MONTHDAY is also supported. The log files will be in a sub-directory based on the following table:

DAILY	logs/YYYY/MM/DD
WEEKLY	logs/YYYY/MM/wWW
MONTHLY	logs/YYYY/MM
ONEDIR	logs/YYYY-MM-DD
MONTHDAY	logs/YYYY/MM-DD

4.1.2 [gcpd]

Glenayre Computer Protocol server configuration.

DEBUG_LEVEL

Sets the amount of debugging information logged to the debug directory. The following is a list of the values for each type of information that can be logged. Add the values together for the value to set the DEBUG_LEVEL. See DEBUG_LEVEL in the [Common] section for a list of values.

AFFINITY_MASK

Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.

INITIAL_THREADS

The initial number of threads to allocate memory and resources for.

MAX_THREADS

The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.

CLEAR_STATS

Controls whether the remote IP address and last number are cleared from the real-time stats viewer. If you want to see the last connection in the real-time stats viewer set this to N (or 0) and the last IP address (for network connections) and last pager ID will remain on the screen until the next call comes in.

BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.3 [httpd]

World Wide Web server. This server also provides support for receiving messages via the WCTP protocol.

DEBUG_LEVEL	Sets the amount of debugging information logged to the debug directory. The following is a list of the values for each type of information that can be logged. Add the values together for the value to set the DEBUG_LEVEL. See DEBUG_LEVEL in the [Common] section for a list of values.
AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
CLEAR_STATS	Controls whether the remote IP address and last number are cleared from the real-time stats viewer. If you want to see the last connection in the real-time stats viewer set this to N (or 0) and the last IP address (for network connections) and last pager ID will remain on the screen until the next call comes in.

MAILBOX_FEATURE_OVERRIDE

When enabled allows the mailbox admin web page to override the features enabled by the selected FCOS. Not recommended for use as your customer packages should be clearly defined by the FCOS. Creating exceptions can cause more administrative work. This does not affect the Omega in any way. It can fully support every mailbox having custom features, it is purely a record keeping caution.

DEFAULT_PAGERTYPE

Default TNPP pager type to use for TNPP Cap paging.

DEFAULT_PAGERCLASS

Default TNPP pager class to use for TNPP Cap paging.

DEFAULT_PAGERFUNCTION

Default TNPP pager function to use for TNPP Cap paging.

DEFAULT_DIALTYPE

Default dialtype to use when creating mbpage records using the web admin pages.

LOG_TYPE

Controls how billing logs are written. Options are to log incoming pages, outgoing pages, or both. See the “Billing logs” chapter for the values of this field.

BILLING_FIELDS

Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

BILLING_FORMAT

Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.4 [monitor]**DEBUG_LEVEL**

Sets the amount of debugging information logged to the debug directory. The following is a list of the values for each type of information that can be logged. Add the values together for the value to set the **DEBUG_LEVEL**. See **DEBUG_LEVEL** in the [Common] section for a list of values.

SCAN_TIME

The amount of time between scans. Typically 60 seconds.

SCAN_TIME	The amount of time between scans. Typically 60 seconds.
MONITOR_PAGEQUE	Enable monitoring of the pageque for stale messages.
MONITOR_ALPDISP	Enable monitoring of the alpha transcription queue (alpdisp).
MONITOR_HD	Monitor hard drive disk usage.
MONITOR_MEM	Monitor memory usage. messages.
MONITOR_DT	Enable digital trunk monitor.

4.1.5 [oimd]

Omega Instant Message server. This server sends messages to logged in users when calls are about to be transferred to their extension [UMS].

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
LISTEN_PORT	TCP port number of the OIM server. Used for internal communications. Normally 1254.
CLEAR_STATS	Clear the number and function information in the real-time stats viewer after client disconnect.
BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.6 [pop3d]

Omega POP3 server.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
CLEAR_STATS	Clear the number and function information in the real-time stats viewer after client disconnect.
BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.7 [rtview]

Real-time statistics viewer.

SCAN_INTERVAL	The amount of time in milliseconds between screen refreshes in the rtview program. This value is typically 1000. Setting to 500 will set the refresh rate to 1/2 second. Values less than 200 are not recommended.
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4.1.8 [smtpd]

Omega SMTP server.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
-------------	---

AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
NO_EMAIL_OLDER_THAN	Allows blocking of email with a Date: header older than this value in seconds.
NO_EMAIL_NEWER_THAN	Allows blocking of email with a Date: header newer than this value in seconds.
PRELOAD_IDBLOCK	Loads the idblock into memory on startup. This option is for very large systems with hundreds of idblocks. It is not recommended for smaller systems because it currently requires the smtpd server be restarted to load changes to any of the idblocks or if new idblocks are created.
PROMPT_DELAY	Delay the sending of the initial 220 hello prompt by this many seconds. This value may be between 0 and 28. Setting to 0 disables any delay. The maximum delay allowed is 28 seconds, any longer and some ISPs may have trouble sending email to the system. This has been implemented to try to reduce email from spammers. This will slow down all incoming email connections by this number of seconds so consider this value carefully. Any data received from the client before we send the 220 hello prompt will be discarded as the remote is supposed to wait until after our 220 prompt before sending its HELO or EHLO.
CLEAR_STATS	Clear the number and function information in the real-time stats viewer after client disconnect.
BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.9 [snppd]

Omega SNPP server.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
PRELOAD_IDBLOCK	Loads the idblock into memory on startup. This option is for very large systems with hundreds of idblocks. It is not recommended for smaller systems because it currently requires the smtpd server be restarted to load changes to any of the idblocks or if new idblocks are created.
CLEAR_STATS	Clear the number and function information in the real-time stats viewer after client disconnect.
BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.10 [standbyc]**4.1.11 [standbyd]****4.1.12 [tapd]**

Omega TAP server.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
-------------	---

AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
PAGEQUEUE_RESCHEDULE	If no outputs available and there are error tries left (from dialtype.MaxErrorTries) push the pagequeue into future based on this value to increase chances of next attempt going through. Typically 180.
MAX_QUEUE_ENTRIES	Maximum number of pages to keep in the processing queue at a time. Once this value is reached the queue will stop being processed until we drop below QUEUE_PERCENTAGE of this value. Typically 100.
QUEUE_PERCENTAGE	Percentage of queue to drop below before re-enabling output processing for a particular device.
CLEAR_STATS	Clear the number and function information in the real-time stats viewer after client disconnect.
BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.13 [tnppd]

Omega TNPP server.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
-------------	---

AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
LISTEN_PORT	The internal TCP port number to listen on for TNPP packets from other Omega programs. This is used when an incoming SNPP message, for example, needs to be sent to a TNPP device.
MAX_QUEUE_ENTRIES	Maximum number of pages to keep in the processing queue at a time. Once this value is reached the queue will stop being processed until we drop below QUEUE_PERCENTAGE of this value. Typically 100.
QUEUE_PERCENTAGE	Percentage of queue to drop below before re-enabling output processing for a particular device.
LOG_DUPS	Log packets with a duplicate serial number. Normally this is disabled.
FAULTOFF_INPUT	If this is enabled and the outgoing TNPP port faults off, the port the packet was received on will also be disabled. Normally this field is set to disabled.
CLEAR_STATS	Clear the number and function information in the real-time stats viewer after client disconnect.
BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.14 [vmbackup]

Daily database backup program. In order to allow a Windows service running as LocalSystem the new SERVER_SHARE and related fields below must be used. Note these are only available in 3.6-11 and higher. Both a username and password on the

remote system and a username and password on the local system are required for this to work. Once setup use something like `\\server\share\backups\%Y-%m-%d` for the `BACKUP_FILE`.

<code>DEBUG_LEVEL</code>	Level of debugging information to write to the debug directory.
<code>AFFINITY_MASK</code>	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
<code>BACKUP_TIME</code>	The time of day in 24-hour time to backup the Omega databases. This is typically done early in the morning. Default value is 0400.
<code>STDOUT_FILE</code>	File to use for redirecting standard output. Normally blank.
<code>BACKUP_FILE</code>	An additional location to place database backups. May be a rewriteable CD for offline storage.
<code>SERVER_PATH</code>	The server name and share name on the remote server. For example <code>\\server\share</code> .
<code>SERVER_USERNAME</code>	A username on the remote system to connect as.
<code>SERVER_PASSWORD</code>	The password for the remote user.
<code>LOCAL_USERNAME</code>	A username on the local system to make the connection to the remote system as.
<code>LOCAL_PASSWORD</code>	The password for the local user.

4.1.15 [vmci]

Computer interface server

<code>DEBUG_LEVEL</code>	Level of debugging information to write to the debug directory.
<code>AFFINITY_MASK</code>	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
<code>MAX_THREADS</code>	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.

CLEAR_STATS	Clear the number and function information in the real-time stats viewer after client disconnect.
BILLING_FIELDS	Specify fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.
BILLING_FORMAT	Specify the format of the fields to write to billing logs. See the “Billing logs” chapter for the format and definition of this field.

4.1.16 [vmmaint]

Maintenance program.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
CLEANUP_TIME	The time of day in 24-hour time to scan the message database removing expired messages.
PURGE_DEBUG_DAYS	The number of days to retain the debug logs. The debug logs may contain extremely detailed debugging information (based on the DEBUG_LEVEL of each program) and should be purged on a regular basis. The default value is 7.
TESTPAGE_ID	The pager ID to send a periodic test page to.
TESTPAGE_INTERVAL	The amount of time in seconds between test pages.

4.1.17 [vmpage]

Outgoing paging server.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
-------------	---

AFFINITY_MASK	Processor affinity mask for multiple processor (SMP) machines. Typically this is set to 15 to run on any of the first four processors in the system. This value does not need to be changed, even for single processor systems.
INITIAL_THREADS	The initial number of threads to allocate memory and resources for.
MAX_THREADS	The maximum number of simultaneous threads to allow this program to create. One thread is required for each port/connection.
MAX_QUEUE_ENTRIES	Maximum number of pages to keep in the processing queue at a time. Once this value is reached the queue will stop being processed until we drop below QUEUE_PERCENTAGE of this value. Typically 100.
SCAN_TIME	The amount of time in seconds to wait between scans of the pageque database. Allowed values are 1 to 60. Typically this is set to 5.
SCAN_TIME	The amount of time in seconds to wait between scans of the pageque database. Allowed values are 1 to 60. Typically this is set to 5.
VFN_STALE_TIME	Pageque entries older than this value in minutes are removed without being paged. An alarm is sent at error level 32 to notify this happened.
ALPHA_STALE_TIME	If an alpha or email pageque is older than this value in minutes the system will check the space available in the output queues. If the output queues are greater than 75% full the message will be scheduled ALPHA_RESCCHEDULE_TIME minutes into the future.
ALPHA_RESCCHEDULE_TIME	The number of minutes into the future to reschedule stale alpha or email pageque records.
PAGEQUE_RESCCHEDULE	The amount of time in seconds to reschedule pageque records if there are no outputs available for the pageque's dialtype.
EMAIL_FROM_PREFIX	String to prefix the mailbox number when sending outgoing email. The default is omega, so email would appear to be from omega.1234567@pager.yourdomain.com.
EMAIL_SUBJECT	Subject to use for outgoing emails if no subject available on the incoming message.

4.1.18 [vmstart]

Main process starter/monitor.

DEBUG_LEVEL	Level of debugging information to write to the debug directory.
SHUTDOWN_TIME	The amount of time in seconds to give processes time to shutdown before forcefully stopping them.
MAX_RETRY_STOP	If a spawned process unexpectedly exits more than 3 times in 60 seconds mark the process stopped and send an alarm. Otherwise if this value is set to false continue to try restarting the process sending an alarm every time it fails.
START	Programs to start and monitor. This is a comma separated list of program names.

4.2 Example omega.ini

```
[common]
MBDIR_FORMAT=0
SPECIAL_CODE=0
MASQUERADE_AS=omegaimail.harktech.com
TIMEZONE_OFFSET=-0500
DAYLIGHT_SAVING=Y
KEY_PORT_DEVICE=DEMO
KEY_PORT_TYPE=
KEY_PORT_NUM=
REMCACHE_EXPIRE_TIME=300
SYSPAGE_PORT=1250
LICENSE_KEY=[insert license key here]
FEATURE_KEY=[insert feature key here]
LDAP_HOSTS=10.100.1.254:389
LDAP_BASE=0=harktech, C=us
LDAP_BINDDN=bwLoginname=paging
LDAP_PASSWORD=ldappw
LDAP_FILTER=(&(objectClass=bwProfileByUsername)(bwService=paging)(bwUsername=%i))
LDAP_VALIDATTR=valid
LDAP_MAXLENATTR=maxlen
LDAP_DIALTYPEATTR=dialtype
```



```

ID_FORWARD=6245
REPLY_FORWARD=6245.....
EMAIL_PREFIX_FROM=From:
EMAIL_PREFIX_TO=To:
EMAIL_PREFIX_SUBJECT=Subj:
EMAIL_PREFIX_BODY=Msg:
DROP_PRIVILEGES=N
LOG_PERIOD=MONTHDAY

\ifthenelse{\boolean{EnableVoice}}{
[board]
#board|pcibus|pcislot|product|name|numchannels|swtyp|equip|clocksource|sourcetrunc
# isdn example
# 0|0|0|AG_4000_2T1|AG-4000-1|2|isdnni2|NT|NETWORK|1|MASTER_A|wnk0 isd0|
0|0|0|AG_4000_2T1|AG-4000-1|2|||NETWORK|1|MASTER_A|nocc wnk0|
1|10|1|AG_Dual_T1|AG-Dual-1|2|||A_CLOCK|1|SLAVE|nocc wnk0|

[trunk]
#trk|brd|chan|type|linecode|frmtyp|sigtyp|dchan|dspstr|dspoff|linestr|lineoff
# isdn example
# 1|0|0|T1-PRI|B8ZS|ESF|PRI|ISDN|16|0|0|0
1|0|0|T1-RBS|AMI_ZCS|D4|||16|0|0|0
2|0|1|T1-RBS|AMI_ZCS|D4|||16|24|4|0
3|1|0|T1-RBS|AMI_ZCS|D4|||16|0|0|0
4|1|1|T1-RBS|AMI_ZCS|D4|||16|24|4|0

}{}

[dbmaint]
ALPHA_TEST_MESSAGE=This is a test.
NUMERIC_TEST_MESSAGE=555-1212

[gcpd]
DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
CLEAR_STATS=N
BILLING_FIELDS=nFrhislLt
BILLING_FORMAT=XXXXXXXXXX XXXXXXXXXXXXXXXXXXXX X Xx:Xx:Xx XXXXX Xxx X

[httpd]
DEBUG_LEVEL=ALL,-MESSAGEDATA,-DOERR,-BIN2STR,-TEMPLATE
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
MAIN_LOGO=/Images/harklogo2.gif

```

```

MAIN_HREF=http://harktech.com
SENDPAGE_IDNAME=pager_id
SENDPAGE_MESSAGENAME=message
SESSION_EXPIRE=86400
MAILBOX_FEATURE_OVERRIDE=N
DEFAULT_PAGERTYPE=p
DEFAULT_PAGERCLASS=A
DEFAULT_PAGERFUNCTION=0
DEFAULT_DIALTYPE=1
BILLING_FIELDS=nFrhislLt
BILLING_FORMAT=Xxxxxxxxxx Xxxxxxxxxxxxxxxxxx X Xx:Xx:Xx Xxxxx Xxx X

```

[isid]

```

DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
CLEAR_STATS=N

```

[monitor]

```

DEBUG_LEVEL=65535
MONITOR_PAGEQUE=Y
MONITOR_ALPDISP=Y
MONITOR_MEM=Y
MONITOR_HD=Y
SCAN_TIME=5
STALE_MIN=240
STALE_MAX=360
\ifthenelse{\boolean{EnableVoice}}{DRIVES=/opt/omega_ums}{DRIVES=/opt/omega_img}
MEM_NOTICE_MIN=64M
MEM_WARNING_MIN=32M
MEM_ERROR_MIN=16M
HD_NOTICE_MIN=500M
HD_WARNING_MIN=250M
HD_ERROR_MIN=100M

```

[oimd]

```

DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
CLEAR_STATS=Y

```

[rtview]

```

SCAN_TIME=500
VERBOSE_LEVEL=2

```

```
[smtpd]
DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
NO_EMAIL_OLDER_THAN=0
NO_EMAIL_NEWER_THAN=86400
BILLING_FIELDS=nFrhislLt
BILLING_FORMAT=Xxxxxxxxxx Xxxxxxxxxxxxxxxxxx X Xx:Xx:Xx Xxxxx Xxx X
```

```
[snppd]
DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
BILLING_FIELDS=nFrhislLt
BILLING_FORMAT=Xxxxxxxxxx Xxxxxxxxxxxxxxxxxx X Xx:Xx:Xx Xxxxx Xxx X
```

```
[tnppd]
DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
TNPPPORT=1251
LOG_DUPS=N
FAULTOFF_INPUT=N
MAX_TNPPQUE_ENTRIES=1000
QUEUE_PERCENTAGE=95
BILLING_FIELDS=nFrhislLt
BILLING_FORMAT=Xxxxxxxxxx Xxxxxxxxxxxxxxxxxx X Xx:Xx:Xx Xxxxx Xxx X
```

```
\ifthenelse{\boolean{EnableVoice}}{
[transd]
DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
REQUIRE_LOGIN=Y
INACTIVITY_TIMEOUT=1800
CLEAR_STATS=N
BILLING_FIELDS=nFrhislLt
BILLING_FORMAT=Xxxxxxxxxx Xxxxxxxxxxxxxxxxxx X Xx:Xx:Xx Xxxxx Xxx X
MACRO_A=
MACRO_Z=
MACRO_O=
```

```
MACRO_9=  
PREFIX=  
SUFFIX=
```

```
[vmail]
```

```
DEBUG_LEVEL=1626111  
AFFINITY_MASK=15  
INITIAL_THREADS=48  
MAX_THREADS=50  
LISTEN_PORT=1252  
REORDER_TONE1=480  
REORDER_TONE2=620  
REORDER_DETECTLEN=200  
REORDER_BANDWIDTH1=50  
REORDER_BANDWIDTH2=50  
PAGEQUE_RESCHEDULE=0  
SWITCH_HOLDMSG_INTERVAL=10  
MAX_QUEUE_ENTRIES=0  
LINE_TERMINATOR=0  
LOGIN_DIGIT=*  
ENABLE_SWITCH=1  
ALLOW_CANCEL=1  
QUEUE_PERCENTAGE=10  
TRANSFER_MESSAGE=  
DEFAULT_PASSCODE=  
DTMF_OFFQUALAMPL=-42  
DTMF_ONQUALAMPL=-36  
DTMF_OFFQUALTIME=35  
DTMF_ONQUALTIME=55  
NUMBEEP_FREQ=2000  
NUMBEEP_AMPL=-24  
NUMBEEP_ONTIME=150  
NUMBEEP_OFFTIME=50  
NUMBEEP_COUNT=3  
RECBEEP_FREQ=1000  
RECBEEP_AMPL=-24  
RECBEEP_TIME=200  
NUM_INITTIME=5000  
NUM_SECTIME=5000  
BILLING_FIELDS=nfrhisHISPLt  
BILLING_FORMAT=Xxxxxxxxxx XXXXXXXXXXXXXXXXXXXX X Xx:Xx:Xx Xx:Xx:Xx XXXXXXXX Xxx X
```

```
}{}
```

```
[vmbackup]
```

```
DEBUG_LEVEL=65535  
AFFINITY_MASK=15
```

```
BACKUP_TIME=0400
STDOUT_FILE=
BACKUP_FILE=
SERVER_PATH=\\server\share
SERVER_USERNAME=username
SERVER_PASSWORD=password
LOCAL_USERNAME=localuser
LOCAL_PASSWORD=localpass
```

```
[vmci]
DEBUG_LEVEL=65535
AFFINITY_MASK=15
INITIAL_THREADS=8
MAX_THREADS=32
BILLING_FIELDS=nFrhislLt
BILLING_FORMAT=Xxxxxxxxxx Xxxxxxxxxxxxxxxxx X Xx:Xx:Xx Xxxxx Xxx X
```

```
[vmmaint]
DEBUG_LEVEL=65535
AFFINITY_MASK=15
CLEANUP_TIME=0300
PURGE_DEBUG_DAYS=7
TESTPAGE_ID=
TESTPAGE_INTERVAL=
```

```
[vmpage]
DEBUG_LEVEL=65535
SCAN_TIME=5
BILLING_FIELDS=nFrhislPt
BILLING_FORMAT=Xxxxxxxxxx Xxxxxxxxxxxxxxxxx X Xx:Xx:Xx Xxxxx Xxxxxxxxxxxxx X
```

```
[vmstart]
DEBUG_LEVEL=65535
START=gcpd,httpd,isid,monitor,pop3d,smtpd,snppd,tapd,tnppd,vmbackup,vmci,\
vmmaint,vmpage
```


Chapter 5

Database Maintenance

There are three methods to maintain the Omega internal databases. These are Command Line, Web-based, and Computer Interface. The command line interface is useful for modifying database entries from over an SSH connection. The web-based interface provides an easy to use interface accessible from any modern browser that supports Javascript and Cascading Style Sheets (CSS). In order to view real-time stats through the web interface a browser that supports AJAX is required. Finally there is also a computer interface for programming the databases over a TCP/IP connection from a corporate billing system.

5.1 Command line

The text-based user interface allows a user to modify subscribers and system settings used by the Omega. The database maintenance program can be accessed from the system console or from an ssh session from any system on the TCP/IP network.

5.1.1 Accessing dbmaint

The database maintenance program is accessed from the command line.

1. On Windows open a command prompt. Or login if using the Linux console or accessing remotely using ssh.
2. Type dbmaint at the command prompt and press the Enter key. The following menu should be displayed:

```
OMEGA \ifthenelse{\boolean{EnableVoice}}{UNIFIED MESSAGING  
SERVER}{INTERNET MESSAGING GATEWAY} 3.5 [omegamail.harktech.com]
```

- 1) Subscriber Administration

- 2) System Administration
- 3) Reports
- 4) Billing
- 6) Queue maintenance
- 9) System Configuration

Enter selection (or Q to quit):

Select an option displayed on the Main Menu by entering the number to the left of the menu item you wish to access.

When adding or modifying field data the default value is displayed in []. Press Enter to accept this value or enter a new value and press Enter. You may also enter a single . to skip the rest of the fields in the record and go directly to the “Are you sure?” prompt.

The following menu options display on the Main Menu. Selection of an option initiates the corresponding utility. The appropriate display window or entry prompts display. Each of the following options is discussed in detail in subsequent sections of this manual.

5.1.2 Subscriber Administration

This option allows you to perform all mailbox maintenance, including viewing adding, modifying, or deleting mailboxes, messages, mailing lists, and pagers.

Entering 1 at the dbmaint main menu will display the following menu:

Subscriber Administration

- 1) Mailbox maintenance
- 2) Mailbox pager maintenance
- 3) Mailbox mailing list maintenance
- 4)
- 5)
- 6)
- 7) Mailbox message maintenance
- 8)
- 9) View alpha logs
- 10)
- 11)
- 12)
- 13)
- 14)
- 15) Email filter maintenance
- 16) Email aliases

Enter selection (or Q to quit):

Not all menu selections are enabled based on the options specified in the license key.

Refer to the “Subscriber Database” chapter for descriptions of these database and the fields in them.

5.1.3 System Administration

This option allows you to configure system-wide settings, including dialing types, feature class of service, limits class of service, and output groups.

Entering 2 at the dbmaint main menu will display the following menu:

System Administration

- 1) Dialtype maintenance
- 2) FCOS maintenance
- 3) LCOS maintenance
- 4) I/O device maintenance
- 5) Output group maintenance
- 6) RCOS maintenance
- 7) User information maintenance
- 8)
- 9) TNPP route maintenance
- 10) IP Filter maintenance
- 11) Modem types
- 12) Virtual hosts (web/email)
- 13) ID blocks
- 14) Input groups
- 15) DNS blocklist
- 16) TNPP filter maintenance
- 17) Remote databases
- 18) SMPP source routing

Enter selection (or Q to quit):

Refer to the “System Database” chapter for descriptions of these database and the fields in them.

5.1.4 Queue Maintenance

This option may only be accessed by authorized individuals and allows for viewing certain internal queues.

5.1.5 System Configuration

This option may only be accessed by authorized individuals and allows the user to create new databases, rebuild data indexes, plus load information from or dump information into ASCII files.

System configuration should only be used under direction of Hark Technical Support. The system configuration options are under password control. It is important to restrict the password to only those users with the authority and knowledge needed to perform the system configuration functions.

Create Empty Data Files

The Create Empty Data Files option allows you to purge all the data referenced in a particular or all Omega databases. Note, this function will delete the existing database before creating the new empty database. Always verify that you do want to purge the data from the existing database and create an empty database.

Note: Most databases are always open while the Omega is running, so typically the Omega service will need to be stopped before creating a database.

Perform the following to purge the data contained in one or more of the Omega databases.

1. Select the Create Empty Data Files option provided on the System Configuration menu by entering a 1 at the Enter Selection prompt. A series of prompts display, guiding you through the process of creating the database. You are presented with a list of databases that can be created.
2. Select one of the databases, or select 99 to create all the databases.

Rebuild Data Files

The Rebuild Data Files option checks for errors within the Omega databases and re-indexes the databases. You have the option to select a particular database that needs to be rebuilt or specify that all Omega databases be rebuilt.

Note: The Omega service must be stopped prior to performing this function.
--

Perform the following to rebuild one or more databases.

1. Select the Rebuild Data Files option provided on the System Configuration menu by entering a 2 at the Enter Selection prompt. A series of prompts display, guiding you through the process of rebuilding the databases. You are presented with a list of databases that can be rebuilt.
2. Select one of the databases, or select 99 to rebuild all the databases. One or more of the following sequences display, depending on your selection.

```
Rebuilding db/datafile
Examining data file db/datafile
Data file rebuild complete (x bytes / y active records)
Rebuilding index file
Index file rebuild complete (x entries added)
Rebuilding additional index #x
Additional index member rebuild complete (x entries added)
```

Dump Data Into ASCII Files

The Dump Data Into ASCII Files option provided on the System Configuration Menu allows you to export the data contained in an Omega database into an ASCII text file. You have the option to select a particular database or specify that all Omega databases be dumped.

Perform the following to dump the data into an ASCII file.

1. Select the Dump Data Into ASCII File option provided on the System Configuration menu by entering a 3 at the Enter Selection prompt. A series of prompts display, guiding you through the process. You are presented with a list of databases that can be exported to text files.
2. Select one of the databases, or select 99 to export all the databases.
3. The system will ask if you want to output field name as first line in file. This is useful for importing the file into a spreadsheet which can get the column names from the first line in the file.

Load Data From ASCII Files

The Load Data From ASCII Files option allows you to import data contained in ASCII text file into an Omega database. This is especially helpful when upgrading a particular database with information from another database that is not compatible. Please note, the database must be empty before loading data into it. Duplicate record errors may be encountered if the database is not empty and you attempt to load data into it from an ASCII file.

Perform the following to load the data from an ASCII file.

1. Select the Load Data From ASCII File option provided on the System Configuration menu by entering a 4 at the Enter Selection prompt. A series of prompts display, guiding you through the process. You are presented with a list of databases that can be imported from text files.
2. Select one of the databases, or select 99 to import all the databases.

5.2 Web browser based

The web-based administrative interface allows a user to modify subscribers and the majority of the system settings from any standard web browser on the TCP/IP network. There is also a limited set of pages available for subscribers to maintain their own information.

5.2.1 Subscriber access

<http://localhost> is used for accessing the web pages the subscriber has access to. An existing mailbox number and passcode is needed to access this web page.

5.2.2 Administrator access

From the local system start a web browser session and go to <http://localhost/admin>. This is the main administration web site where a person with the proper permissions can setup subscribers and their settings or system configuration settings. You will need a user and password setup in the user database to login to this page. Once logged in you will have the following options:

- Subscriber - Allows access to subscribers, subscriber pagers, email filters, time steering, holidays, and other subscriber settings.
- System - Accessible only to users with a high enough security level. All system setup and configuration is done from these menu selections. This is where the devices, output groups, dialing types, classes of service and other system settings are maintained.
- Stats - Display real-time statistics for each of the programs. This allows you to view which Omega applications are running and also click on those programs to view the status of the individual threads in each program that supports it.
- Logout - Logout of this session. This is only required if you want to switch from the admin web pages to the subscriber web pages described below.

There is now the capability for resellers to access their own accounts. Setup a username for the reseller with the reseller security level and they will only be able to view mailboxes with the same account number as the account number defined in the reseller's user record.

5.2.3 Customization

The web pages are based on templates and can be modified to suite your needs. The original source for all web pages is in the `www/default` sub-directory of the Omega installation directory. Do not modify the pages in the default directory. Make a copy of the default directory to another sub-directory of `www` (e.g. `www/harktech`). Then modify the `html` and `css` files in the new directory. In order for the Omega to start using this new directory create a virtual host and enter the directory name without the `www/` (e.g. `harktech`).

The templates are parsed by the web server as the pages are requested. Conditions, variable substitution and loops are supported. Template variables and control structures start with `<@@` and end with `@@>`. The `<@@` and `@@>` must be on the same line. The following are the types of substitutions you may see:

- Database variable substitution will look like `<@@mailbox.MailboxNumber@@>`. In this example, `mailbox` is the database and `MailboxNumber` is the field in that database. This is case sensitive. Make sure that you match the case with the database field name in the subscriber and system database chapters.
- If condition will start with `<@@if ...@@>` and end with `<@@endif@@>`. The text between these two tags will be displayed if the test evaluates true, otherwise it will be skipped. The else condition looks like `<@@else@@>` and can be used to display one thing if the test is true and something else if the test is false.
- Database loops start with `<@@loop database="lcos"@@>` and end with `<@@endloop database="lcos"@@>`. The database name may be any of the supported databases, `lcos` is used here as an example.

The web pages themselves are the best examples of how the templates work in actual use.

5.3 Computer Interface

The computer based interface allows a user to modify subscribers and the majority of settings used by the Omega that are contained in the `mailbox` and `mbpage` databases. To connect to the computer interface open a TCP/IP connection to the TCP port number defined in the device record for the computer interface port.

Four basic commands are used, including Show, Add, Modify, and Delete.

All command strings start with an `@` followed by the command (S, A, M, or D) then the database to be worked on (M for `mailbox` and P for `mbpage`).

The above is then followed by a comma and the record key to process. For the mailbox database, enter the mailbox number. For the mbpage database, enter the mailbox number followed by a hyphen (-), then the order number, then another hyphen, and finally the serial number.

After specifying a command followed by the key, you need to specify which fields you wish to process. Refer to Appendix B for a list of the computer interface field numbers and descriptions.

All commands end with a carriage return. All return sequences will end with a carriage return and a line feed (<CR><LF>). Sending a <CR><LF> without any data will return a > followed by a <CR><LF>. Successful commands will start with a * followed by a <CR><LF>. Show commands will return the data for the fields requested separated by commas starting with a (and ending with) followed by <CR><LF>. Failures will start with a ? followed by a two digit error number and a description of the error.

Refer to the following examples for the basic formats used for the computer interface commands.

Note that mb equals the mailbox number, ord equals the order number, ser equals the serial number, act is the mbtree action, cond is the mbtree condition, and blocknum is the idblock number.

```

Show mailbox:  @SM,mb,fld1,fld2,..,fldn<CR>
Add mailbox:   @AM,mb,fld1=val1,fld2=val2,..,fldn=valn<CR>
Mod mailbox:   @MM,mb,fld1=val1,fld2=val2,..,fldn=valn<CR>
Del mailbox:   @DM,mb<CR>

Show mbpage:   @SP,mb-ord-ser,fld1,fld2,..fldn<CR>
Add mbpage:    @AP,mb-ord-ser,fld1=val1,fld2=val2,..fldn=valn<CR>
Mod mbpage:    @MP,mb-ord-ser,fld1=val1,fld2=val2,..fldn=valn<CR>
Del mbpage:    @DP,mb-ord-ser<CR>

Show mbtree:   @ST,mb-act-cond,fld1,fld2,..fldn<CR>
Add mbtree:    @AT,mb-act-cond,fld1=val1,fld2=val2,..fldn=valn<CR>
Mod mbtree:    @MT,mb-act-cond,fld1=val1,fld2=val2,..fldn=valn<CR>
Del mbtree:    @DT,mb-act-cond<CR>

Show idblock:  @SI,blocknum,fld1,fld2,..,fldn<CR>
Add idblock:   @AI,blocknum,fld1=val1,fld2=val2,..,fldn=valn<CR>
Mod idblock:   @MI,blocknum,fld1=val1,fld2=val2,..,fldn=valn<CR>
Del idblock:   @DI,blocknum<CR>

```

5.3.1 mailbox Field Numbers

1	MB_MAILBOXNUMBER
2	MB_TOPBOX
3	MB_ACCOUNTNUMBER
4	MB_PASSCODE
5	MB_VALID
6	MB_FCOS
7	MB_LCOS
8	MB_RCOS
9	MB_KEYMAP
10	MB_GREETINGNUMBER
11	MB_INCOMINGCALLS
12	MB_SEQUENCENUMBER
13	MB_DISPATCHCALLS
14	MB_MAILBOXSTORAGE
15	MB_CCNUMBER
16	MB_CASCADETO
17	MB_COPYTO
18	MB_FORWARDTO
19	MB_REPETITIONS
20	MB_TIMEOUT
21	MB_EMAILALIAS
22	MB_PHONE
23	MB_CHARCOUNT
24	MB_ALPHAENABLED
25	MB_ALPHASTART
26	MB_ALPHAEND
27	MB_LASTSYSMSG
28	MB_CONTACT
29	MB_MSGCOUNT
30	MB_INCOMINGALLOW
31	MB_CASCADEDISPOSITION
32	MB_DISPATCHALLOW
33	MB_CHARALLOW
34	MB_MSGALLOW
35	MB_INCOMINGDEC
36	MB_LANGUAGE
37	MB_DISPATCHDEC
38	MB_CHARDEC
39	MB_MSGDEC
40	MB_DELIVERYTYPE
41	MB_TRANSFERTYPE
42	MB_FAXSID
43	MB_TREECONDITIONDIGITS
44	MB_CAPCODE

45 MB_PAGERTYPE
46 MB_RFCHAN
47 MB_RFZONE
48 MB_SENDTOLIST
49 MB_BADTELATTEMPTS
50 MB_MAXTELATTEMPTS
51 MB_BADWEBATTEMPTS
52 MB_MAXWEBATTEMPTS
53 MB_CREATEDBY
54 MB_CREATEDDATE
55 MB_MODIFIEDBY
56 MB_MODIFIEDDATE
57 MB_CALLERPASSCODE
58 MB_INUSE
59 MB_FEATURE1
60 MB_FEATURE2
61 MB_FEATURE3
62 MB_FEATURE4
63 MB_MAXTRUNKS
64 MB_MWIONTYPE
65 MB_MWIOFFTYPE
66 MB_MWINUMBER
67 MB_LOGINDIGIT
68 MB_SWITCHDIGITS
69 MB_AUTOCOUNTDOWNRESET
70 MB_DEFAULTVOICEFORMAT
71 MB_CALLTIME
72 MB_CALLALLOW
73 MB_CALLDEC
74 MB_COUNTERRESETSTAMP
75 MB_TIMEZONEOFFSET
76 MB_DAYLIGHTSAVING
77 MB_MAXTRUNKPERCENTAGE
78 MB_ENABLETUTORIAL
79 MB_SCREENCALLS
80 MB_SWITCHFALLBACK
81 MB_DEPARTMENT
82 MB_ALLOWSOURCE

5.3.2 mbpage Field Numbers

1 MBP_MAILBOXNUMBER
2 MBP_ORDER
3 MBP_ENABLED
4 MBP_NOTIFICATION
5 MBP_DIALTYPE

- 6 MBP_DIALNUMBER
- 7 MBP_TRIES
- 8 MBP_INTERVAL
- 9 MBP_PAGERSTART
- 10 MBP_PAGEREND
- 11 MBP_SERIALNUM
- 12 MBP_MSGTYPE
- 13 MBP_PAGERTYPE
- 14 MBP_PAGERCLASS
- 15 MBP_PAGERFUNCTION
- 16 MBP_PAGERPRIORITY
- 17 MBP_OUTGOINGCALLS
- 18 MBP_CHARCOUNT
- 19 MBP_DESCRIPTION
- 20 MBP_PAGERSERIALNUM
- 21 MBP_PAGEFIELDS
- 22 MBP_PAGERDAYS
- 23 MBP_FROMFORMAT
- 24 MBP_VOICEFORMAT
- 25 MBP_SEQUENCENUM
- 26 MBP_SUBCAP

5.3.3 mbtree Field Numbers

- 1 MBT_MAILBOXNUMBER
- 2 MBT_CONDITION
- 3 MBT_ACTION
- 4 MBT_DESTINATION
- 5 MBT_SEQUENCENUM

5.3.4 idblock Field Numbers

- 1 IDB_NUMBER
- 2 IDB_NAME
- 3 IDB_ENABLED
- 4 IDB_IDSTART
- 5 IDB_IDEND
- 6 IDB_RCOS
- 7 IDB_DIALTYPE
- 8 IDB_LCOS
- 9 IDB_TNPPDEST
- 10 IDB_INPUTGROUP
- 11 IDB_PREFIX
- 12 IDB_STRIPCHARS
- 13 IDB_STRIPLLEN

- 14 IDB_APPEND
- 15 IDB_PAGEFIELDS
- 16 IDB_FCOS
- 17 IDB_FROMFORMAT
- 18 IDB_NUMDIALTYPE
- 19 IDB_REMOTEPORT

Chapter 6

Real-time Statistics

The Omega has a few methods for viewing system activity in real-time. These are command line, graphical, and web-based. See the “Program Description” chapter for more information on the individual programs mentioned below.

6.1 Command line

Both the Linux and Windows versions support showstat to show a snapshot of the current stats for a particular program. Showstat is called from the command line either locally on the console or remotely using SSH.

The Linux version also has a command-line real-time stats program that automatically updates the screen called rtview.

There is also a billing log viewer called showlog.

6.2 Graphical

The Windows version has a graphical real-time stats viewer called ShowStats.

6.3 Web browser

Both the Linux and Windows versions support viewing the real-time stats from a modern web browser. Internet Explorer 6+ and Firefox have been tested.

Chapter 7

System Databases

In addition to the ini file which controls global and program specific configuration, the system databases define the various configurations which apply to system settings.

7.1 dialtype

Dial types specify how the Omega application dials out. This is used to alert pagers or other devices when a message has been received. Each dialtype references a particular output group to send the message. More than one dialtype may specify the same output group. Each output group specifies one or more devices that this dialtype is allowed to use.

When the system prepares a message for paging it checks to see if there is a current connection with the same dialtype. If so, that connection will be used to send the message. An example for this would be a connection is in progress for a TAP out-dial to paging carrier A, any more messages for paging carrier A received while that outgoing modem connection is in progress would automatically be added to the end of the queue and sent in the same phone call.

If, while processing the paging queue, there is a message for a different dialing type, but that dialing type uses the same output group as another, the page will be sent to the least busy device in that output group.

7.1.1 Fields

Number	A unique identifier for the dialing type. It is a number in the range of 1 to 65535.
--------	--

Name	A descriptive name for this dialtype. It may be up to 32 characters long.
ItemCode	A code used for billing each outgoing call for this particular dialtype. Up to eight characters may be entered. This code can optionally be logged in the billing logs. See the “Billing logs” chapter for more information.
Protocol	<p>Protocol for this dialtype. Valid protocols are:</p> <ol style="list-style-type: none"> 1 DTMF 2 MF 3 TAP 4 GCP 5 TNPP 6 External 7 SNPP 8 HTTP 9 SMTP 11 SMS 12 SMDI 13 AOL Instant Messenger 14 SMPP 15 WCTP
ProtocolOptions	<p>Optional settings for certain protocols. Add values together for combinations. Valid codes include:</p> <p style="text-align: center;"><u>TNPP options</u></p> <ol style="list-style-type: none"> 1 ID packet 2 CAP packet 4 Transparent CRC 8 Simplex <p style="text-align: center;"><u>TAP options</u></p> <ol style="list-style-type: none"> 8 TAP 1.6+ transparent control char support 16 TAP extension blocks

DTMF/MF options

- 1 Immediate start for wnk0 AG Protocol

HTTP options

- 1 Send message using HTTP POST (default is GET)
- 2 Insert dashes into PIN (AT&T Wireless)
- 4 Insert beginning of text into From field (AT&T Wireless)

SMTP options

- 1 Don't require . on line by itself to terminate DATA
- 2 Enable delay before sending initial 220 prompt
- 4 Require FQDN for HELO argument

ISI options

- 1 Use AirPage billing system protocol

General options

- 536870912 Encrypt TAP/TNPP over Internet connections
 1073741824 Strip dashes from ID
 2147483648 Strip leading zeros from ID

OutputGroup Specify the output group to be used. See section 5.6 for more information. This is a number between 1 and 65535.

MaximumErrorTries Identify the maximum number of resends if there was an error in sending the message.

DialFormat Identifies how a call is to be placed. Valid codes are listed below. The maximum length is 80 characters.

- 0-9,*,#,A-D DTMF Tones
- c Connect immediate (not normally used)
 - p Short Pause (500ms)
 - P Long Pause (2 sec)
 - f Insert Sender
 - i Insert Mailbox phone number
 - I Insert Mailbox number
 - k Play newest fax message
 - K Play newest voice message
 - U Insert mbpage DialNumber (or MWI number)

\	Insert numeric message
/	Insert alpha message
V	Wait for voice begin
v	Wait for voice end
R	Wait for ring begin
r	Wait for ring end
Q?	Wait for DTMF, ? is the DTMF char to wait for
;	Wait for dialtone
+	Insert caller ID (if available)
=	Insert caller name (if available)
Ee,s,t	Wait for energy (see below)
Se,s,t	Wait for silence (see below)
nAEFNVZ	Send number of messages (see below)
J#	Play system prompt, # is the prompt number to play, may optionally have () if needed, for example J(267)
-	Phone number delimiter, for example 1-800-123-4567
“text”	Send text to alpha pager, for example “You have a message in ”

AEFNVZ in the n option will send the number of new Alpha, Email, Fax, Numeric, Voice, and all messages, respectively. The Z option is special and indicates the total number of new messages. One of the following two forms must be used; 1) n then a single character indicating which new message count, or 2) n followed by a group of tokens enclosed in parenthesis. An example of the second would be n(VFN) to get the total new Voice, Fax and Numeric messages.

BlockFormat	Addressing format for messages that came in using an ID block. This can be used to prefix and/or append data to the outgoing number (or email address). The maximum length is 80 characters.
MaxAlphaLen	Specifies the maximum number of characters that the remote system supports in a message.
MaxOutputChars	Specifies the maximum number of characters to send to remote. For example, you can limit a 1000 character incoming email to only send out 240 characters. If this field did not exist, Omega would split a long message up into multiple sections of MaxAlphaLen characters until the message was sent. When using this field, it is possible to enter 240 characters in the MaxOutputChars field and identify the MaxAlphaLen as 80 characters and send three 80 character messages to a paging system that only supports 80 character messages.

StripEmailHeaders	This field is used to restrict the amount of data from an incoming email sent to pagers and cellular phones which can severely limit the length of messages. This is only really needed if you are sending messages to paging and cellular phone companies using email. If you are delivering the message using any other protocol such as TAP or SNPP, this field is ignored. It works by stripping any headers from the incoming email. It also will recognize attachments and notify the user by appending [MIME attachments] to the end of the message.
Username	Username to send to a remote device requiring a login.
Password	Password to send to a remote device requiring a login.
BackupDialtype	A backup dialtype to use if a connection can not be made to a remote SNPP, SMTP, HTTP, or WCTP server. The dialtype entered must be a valid dialtype on the system and should preferably be a dialout type such as TAP.
ExternalProgram	The full path and parameters of an external program to run for delivery of the message.
MaxFromLen	Maximum number of characters of the From: email address to send to the notification device. Allowable values are 0 to not limit the from length or a number from 1 to 80.
MaxToLen	Maximum number of characters of the To: email address to send to the notification device. Allowable values are 0 to not limit the from length or a number from 1 to 80.
MaxSubjectLen	Maximum number of characters of the Subject: email header to send to the notification device. Allowable values are 0 to not limit the from length or a number from 1 to 80.

MaxIdLen	Maximum number of characters of the pager id to send to the notification device. This is used for backup dialtypes where the paging carrier uses 10 digits on the SNPP (or other) input, but the only accepts 7 digits on the TAP dialup.
SendFields	Specify which email headers to send out.

Serial port dialing types support the following additional fields:

ModemNumber	Modem number to dial for TAP or TNPP connections. Leave blank for direct RS-232 connections.
Baud	Specifies the baud rate of the RS-232 connection
Parity	Parity of the RS-232 connection. May be E for Even, O for Odd, M for Mark, S for Space, or N for None.
DataBits	Number of data bits. May be 7 or 8.
StopBits	Number of stop bits. May be 1 or 2.

TCP/IP dialing types support the following fields:

Host	The Internet host name of the remote server. This may also be an IP address instead of the host name.
Port	The TCP port number of the remote server. This is a number in the range of 1 to 65535.
InitialTimeout	The initial time in milliseconds to wait for data from the remote device.
SecondaryTimeout	The amount of time in milliseconds to wait for additional data. This timeout is reset every time more data is read from the remote device.

TNPP dialing types support the following additional fields:

TnppSrc	TNPP source ID to use when sending messages.
TnppDest	TNPP destination ID to use when sending messages.
Inertia	Maximum number of TNPP “hops” to allow.
RFChan	Only used for TNPP CAP connections. Specifies the RF channel on the remote paging terminal to use. Allowable values are 0 to 63.
RFZone	Only used for TNPP CAP connections. Specifies the RF zone on the remote paging terminal to use. Allowable values are 0 to 63.

HTTP dialing types support the following additional fields:

SendFormName	The full URL of the HTTP form to POST the message to for delivery using the carrier’s web site. This and the other HTTP paging fields are mostly used by cellular phone providers which only offer an email gateway for paging via the Internet. Direct HTTP is preferable to SMTP because you get an immediate acknowledgement if the message was accepted or not. With email you may not ever know if the message was actually accepted and you have no control over the format of the message (for example which email headers are sent).
SendIdName	The name of the HTTP form field that accepts the pager or cellular phone number to page.
SendMessageName	The name of the HTTP form field that accepts the message.
SendSuccessString	The text (or portion of) that specifies the message was accepted for delivery.
SendFromName	The name of the HTTP form field that accepts the from address. This field is optional and if left blank the from address will not be sent. Also note that not all carriers support sending the from address.

SendSubjectName	The name of the HTTP form field that accepts the subject. This field is optional and if left blank the subject will not be sent. Also note that not all carriers support sending the subject.
SendExtra	Additional text that needs to be posted to the HTTP form in order for the message to be accepted. This is used for special cases and the assistance of Hark technical support may be needed for proper setup.
SendMsgLenName	The name of the HTTP form field that accepts the length of the message. This field is optional and if left blank the length will not be sent. Also note that not all carriers support sending the length.

7.2 fcoss

Feature Class of Service (FCOS) defines which features a particular mailbox can use. This allows the service provider to customize services and charges for additional options, or limit the features available to their subscribers.

7.2.1 Fields

Number	This is a unique identifier for each class of service. You may specify a number from 1 to 65535.
Name	A description of the class of service. Up to 32 characters may be entered.
Login	Allow subscriber to login to their mailbox from a telephone.
Relogin	Allow subscriber to login to additional mailboxes without hanging up and calling back.
Web access	Enables or disables the ability for the subscriber to have web access to mailbox data. Web access allows the subscriber to enter their mailbox and passcode and update certain settings. They can modify certain mbpage settings, and may also view or play any messages in their mailbox.
Administrative Functions	Allow subscriber to special administrative features. This allows system prompts to be changed by logging in over the telephone.
Menu tree	Enable tree functions for this mailbox. This allows the subscriber to have press "1" for sales, etc.
Toll saver	When enabled the caller will hear rings before their greeting if they have no new messages. If they have new voice/fax messages, the line will not ring and they will hear their greeting right away.

Guest edit	Allows callers to edit their voice message before the mailbox accepts it.
Alpha transcription	Enable alpha page transcription option.
Voice message	Allow callers to leave a voice message.
Numeric message	Allow callers to leave a numeric message.
Fax message	Allow callers to leave a fax. This requires optional additional cost fax licenses.
Alpha message	If enabled, allows receiving of alphanumeric messages. Typically this is from TAP, TNPP, SNPP, or the web.
Email message	If enabled, allows incoming email messages to a mailbox.
Countdown	If enabled, allows hard limits to be set on the amount of calls, characters, or messages received by a mailbox. When a mailbox has used all of their allowance, the mailbox is disabled from receiving any additional calls. As of version 2.6.0 an auto-reset is now available. The countdown counters can now be reset either daily or monthly.
Alpha logging	Appends a copy of an incoming alpha message to a subscribers individual alpha log.
Sequence number	Maintain a sequence number for each alpha transcription message.
Page time stamp	Add a time stamp to alpha transcription messages.
Switch	Enable telephony switching. This allows incoming telephone calls to be routed out another telephony port. This can be used for switching the live call to a paging terminal or answering service directly.

Stamps on end	Append alpha transcription stamps to end of message instead of prefixing them to the beginning.
Alpha dispatch ignore high	There is a configurable high message limit in the alpha transcription settings which prevents more than x messages to be transcribed. This overrides that setting and allows all messages for subscribers in this class to be transcribed.
No web delete message	Disable the delete button on the subscriber message maintenance web pages.
Tutorial	Allow mailbox to enable new user tutorial.
No storage	Remove the message record immediately after it is paged. This is the default for messages received via an idblock.
No auto bulletin	Do not automatically play a system bulletin the subscriber hasn't heard yet. The subscriber can play the bulletin by pressing '2' from the main menu as long as they are setup to use the Omega voice keymap.
Voice greeting	Allow a custom voice greeting for the mailbox. If a custom voice greeting has not yet been recorded, it will play a default voice greeting. If disabled on a numeric mailbox, a three-beep prompt will be used.
Deleted messages	Allow subscriber to access messages they have marked deleted. Deleted messages are retained for the Deleted Message time in LCOS.
Fax only send new	Allows a mailbox that is set as fax only to immediately start sending all new faxes once the subscriber has logged in. In order to use this feature the subscriber must login from a fax machine. After logging in press start on the fax machine and all the new faxes will immediately be received.

FIFO	Play voice, fax, and numeric messages in First-in-First-out order (oldest to newest) instead of the default Last-in-First-out (newest to oldest)
Delete after play	Automatically mark messages deleted once the subscriber has listened to the complete message.
Send message	Allow subscriber to send a message to another mailbox while they are logged in to their mailbox.
Forward to	Allow a subscriber to change their mailbox forwardto number.
Fax greeting	Allow a subscriber to record a fax greeting. When callers call this mailbox they will immediately hear a fax tone. At this point the caller should press Start on their fax machine to receive the fax.
Keep delete	Allow the subscriber to keep or delete voice, fax, or numeric messages.
Distribution lists	Allow subscriber to setup and maintain private mailing lists for voice, fax and numeric messages.
Message class	Allow subscriber ability to change the message class.
Numeric only verify	For numeric only mailboxes this will read back the number entered and asked for confirmation. This can be used for a card verification service where the numbers entered are then sent to the customer so they know who has activated their card.
Mark fastforward played	Normally when a subscriber fast-forwards through a message the message is not marked played as the system doesnt consider the entire message listened to. This allows that to be overridden.

Allow play DTMF	Ignores any DTMF key presses while a message or prompt is being played. This turns off the type-ahead feature and should not be used unless you have a special application where it is needed.
Allow record DTMF	Ignores any DTMF key presses while a message is being recorded. This will prevent * from stopping a recording and should not be used unless you have a special application where it is needed.
Play transferring prompt	Allow the “Please wait transferring...” prompt to be disabled when a call is being transferred.
Cancel empty message	Dont send TNPP packets with no message data.
Text to speech	Enable the option additional cost text-to-speech feature on this mailbox.
Delivered cascade	Allow messages delivered to a mailbox’s mbpage record to be cascaded to the next mbpage even if successfully delivered to the previous pager.
Mark email delivered	Mark email delivery of voice or fax message to be considered played.
Startel record	Enable Startel quick-record features. Allows 227 to backup to the beginning an re-record.
Send account only	Only allow subscriber to send/reply/transfer to another mailbox with the same account number. The default is to allow any mailbox to send to another mailbox.
Auto next	Automatically start playing the next message after a keep or delete.
Modify name	Allow subscriber to modify their recorded name.
Modify greeting	Allow subscriber to modify their custom greeting.

Modify lists	Allow subscriber to modify their private distribution lists.
Modify auto transfer	Allow subscriber to modify their auto-transfer settings.
Modify dial number	Allow subscriber to modify their pager outdial number.
Modify forwarding	Allow subscriber to modify their pager forwarding settings.
Modify forward to	Allow subscriber to modify their mailbox forward to number.
Modify notification schedule	Allow subscriber to modify their pager notification schedule.
Modify greeting number	Allow subscriber to modify their greeting number. Also needed if the subscriber to to be allowed multiple greetings.
Modify alpha schedule	Allow subscriber to modify their alpha transcription schedule.
Modify copy to	Allow subscriber to modify their copy to mailbox number.
Modify cascade to	Allow subscriber to modify their cascade to mailbox number.

7.3 lcos

Limits Class of Service (LCOS) sets limits on the length, quantity, and retention of messages. This allows a service provider to offer longer messages or retention times as a premium service.

7.3.1 Fields

Number	This is a unique identifier for each class of service. You may specify a number from 1 to 65535.
Name	A description of the class of service. Enter up to 32 characters.
MaxMessages	The maximum number of messages allowed in a mailbox at one time. Only played and unplayed messages count towards this maximum; deleted messages are not counted.
MaxAlphaLen	The maximum length of an alphanumeric message in characters. This value can be from 0 to 990.
MaxTnppLen	The maximum length of a message received on a TNPP port in characters. This value can be from 0 to 990.
MaxEmailLen	The maximum length of an email message in characters. This value can be from 0 to 990.
AlphaRetention	The maximum number of hours, from the time received, that an alphanumeric message is stored.
EmailRetention	The maximum number of hours, from the time received, that an email message is stored.
MaxMessageOption	The action to take if the mailbox is full and another incoming message is requested. Valid values are: <ul style="list-style-type: none"> 1 Delete oldest message 2 Delete oldest played message 3 Don't allow any new messages
MaxMailListEntries	The maximum number of entries per mailbox mailing list.
MaxGreetingLen	The maximum length of a voice greeting in seconds.
MaxVoiceLen	The maximum length of a voice message in seconds.

MaxFaxLen	Reserved for future use. The maximum length of a fax message in pages.
MaxNumericLen	The maximum length of a numeric message the caller can leave.
PlayedRetention	The maximum amount of time in hours to retain a voice or fax message after it has been marked played.
UnplayedRetention	The maximum amount of time in hours to retain a voice or fax message that has not yet been played.
DeletedRetention	The maximum amount of time in hours to retain a voice or fax message once it has been marked deleted.
NumericRetention	The maximum amount of time in hours to retain a numeric message.
MinMsgLen	The minimum length in seconds a voice message must be before it is considered a valid message and stored. Normally this is set to 2 to cut down on messages being record for hangups.
MaxNameLen	The maximum amount of time in seconds the subscribers recorded name may be. This is also known as the voice signature.
MaxTTSLen	The maximum number of characters in a text message to convert to a voice message using text-to-speech.
MaxGreetings	The maximum number of greetings this mailbox is allowed to have. This number may be from 1 to 99.
MaxPasscodeLen	The maximum length of the passcode for this mailbox. This number may be from 1 to 8.

7.4 devices

The I/O Devices Maintenance option provided on the System Administration menu allows you to define the device information for all the Input and Output ports.

All COM ports must be defined here whether they are incoming or outgoing. The device name must be a valid COM port defined in Windows 2000. Go to My Computer->Manage->Device Manager->Ports to see the valid COM ports for your system.

Only outgoing TCP connections need to be defined in this table. Incoming TCP connections are setup in omega.ini for each protocol server. The format of the device name for TCP connections is OTCP:uniquenum. The : after OTCP is required. The uniquenum is a unique number for this output.

7.4.1 Fields

Device

The name of the I/O device. In order for the threads to show properly sorted in the real-time stats viewer the following formats should be used: COM001, TCP:00444. For serial ports these are the COM number padded with zeros to three digits. For example, COM1 will be COM001 and COM12 would be COM012, etc. For incoming TCP ports this is the TCP listen port on which to listen padded with zeros to five digits. For example, SNPP listening on port 444 will be TCP:00444, HTTP on port 80 is TCP:00080, etc. Up to 32 characters may be entered.

Description	A description of the I/O device.
Status	The device status. Valid values are: <ol style="list-style-type: none">1 On-line2 Off-line3 Fault-off
BackupDevice	Device to use if this port is offline or has faulted off.
Direction	Direction of this port. Valid values are: <ol style="list-style-type: none">1 Input2 Output3 Bi-directional
Type	Type of device. Valid values are: <ol style="list-style-type: none">1 Serial2 Network3 Telephony
Protocol	The type of protocol to use for this port. Valid values are: <ol style="list-style-type: none">1 DTMF2 MF3 TAP4 GCP5 TNPP6 External7 SNPP8 HTTP9 SMTP10 VMCI11 SMS12 SMDI13 AOL Instant Messenger14 SMPP15 WCTP16 POP317 TRANS18 OIM19 STANDBY20 REMOTEDB21 ISI

ProtocolOptions Add values together for combinations. Valid values are:

DTMF/MF options

- 1 Immediate start for wnk0 AG Protocol

TNPP options

- 1 ID packet
- 2 CAP packet
- 4 Transparent CRC
- 8 Simplex
- 16 Hark ISI/IPT
- 32 Alternative TNPP over TCP/IP protocol
- 64 Alternative TNPP request ACKs
- 128 Alternative TNPP sending ACKs

TAP options

- 8 TAP 1.6+ transparent control char support
- 16 TAP extension blocks

HTTP options

- 1 Send message using HTTP POST (default is GET)
- 2 Insert dashes into PIN (AT&T Wireless)
- 4 Insert beginning of text into From field (AT&T Wireless)

SMTP options

- 1 Don't require . on line by itself to terminate DATA
- 2 Enable delay before sending initial 220 prompt
- 4 Require FQDN for HELO argument

ISI options

- 1 Use AirPage billing system protocol

General options

- 536870912 Encrypt TAP/TNPP over Internet connections
- 1073741824 Strip dashes from ID
- 2147483648 Strip leading zeros from ID

DebugLevel	Device specific debug level. Changing this value allows you to have a low debug level for the main program and have increased debugging on a particular port.
Username	Username to log into the remote device with. This is also used for the system_id field when binding to an SMPP server.
Password	Password for the above username. This is also used for the password field when binding to an SMPP server.
SystemType	System type to use for SMPP connections. Normally SMSC.
SourceAddress	Source address to use for SMPP connections.
LogPacket	Log incoming packets to billing logs.
SendStats	Send TNPP stats to Hark Stats computer.
OutputRate	Maximum rate to send outgoing pages.

RS-232 devices support the following additional fields:

ComPort	The name of the physical comport. An example for Windows would be COM1. In Linux an example would be /dev/ttyS1 or /dev/ttyUSB0.
Baud	Baud rate of RS232 connection.
Parity	Parity of RS232 connection. Valid codes include E (Even), O (Odd), M (Mark), N (Non), and S (Space).
DataBits	Data bits of RS232 connection.
StopBits	Stop bits of RS232 connection.
ModemType	The type of modem. If this is a direct connection set this value to 0. Otherwise enter the number of the modem in the mdmtype table.

Network devices support the following additional fields:

Host	The fully qualified host name of the remote server to connect to. This is only used for client connections. A client connection is where the Omega initiates the connection to a remote device acting as a server. A server connection is one where the Omega listens on a known port for connections from remote clients.
Port	For client connections, this is the port number to connect to. For server connections this is the port number to listen on.
IPFilter	ipfilt to apply for incoming connection requests. See ipfilt for more information.
InitialTimeout	The initial time in milliseconds to wait for incoming data after a connection request is received.
SecondaryTimeout	The additional time in milliseconds to wait for more data to arrive once we start receiving data from a connection request.

TNPP devices support the following additional fields:

TnppID	TNPP ID used for sending the init packet to the remote TNPP device. Also, if an incoming ID packet is received on this device with this TNPP ID as the destination the packet will be looked up in the mailbox database and delivered locally if it exists. If the mailbox doesn't exist the packet will be looked up in idblock. If an ID block is found the packet will be routed to the idblock's TNPP destination. Otherwise, if the packet is not for this device and it is not found in mailbox or idblock, the destination will be routed based on entries in tnppout.
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TnppFilter	tnppfilt entry to use for specifying which TNPP packets we will accept on this port.
TnppFilterDefault	Set to A to accept packets by default. Set to D to deny packets by default. This field is used in conjunction with TnppFilter above (section 5.4.21).
Tict	Intercharacter timer in hundredths of seconds.
Tnri	No response idle timer in seconds
Tnrb	No response busy timer in seconds
Tnre	No response to ENQ timer in seconds
Thold	Amount of time in seconds to hold off on retransmitting when an RS is received.
Tidle	Number of seconds of no activity to wait before sending a link test.
CretryMax	Number of retries to send.
CholdMax	Number of attempts to send a packet if RS'd.
CenqMax	Number of attempts to send a link test before marking the port fault-off.
SimplexTransmits	Number of times to send a simplex packet to help ensure that the packet gets through as there is no positive or negative acknowledgement that the packet was received.
MaxPacketSize	The maximum size TNPP packet the the device supports. Normally this is 1024, however some systems conforming to TNPP 3.8 allow 4096 byte packets.

Natural Microsystems AG devices support the following additional fields:

Trunk	The trunk number from the omega.ini file.
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Channel	The channel on the telephony board. T1 boards are numbered from 1 to 24 and analog boards are numbered 1 to 8.
DefaultID	The default mailbox ID to use when no digits are received from the telephone company. This is usually only used on POTS lines which don't offer DNIS like DID trunks do.
Ring2ID	The default mailbox ID to use when distinctive ring is enabled and the secondary ring is detected.
Ring3ID	The default mailbox ID to use when distinctive ring is enabled and the tertiary ring is detected.

7.5 ingrp

The Input Group Maintenance option provided on the System Administration menu allows you to define which input ports are grouped together for common settings and input ID translation.

7.5.1 Fields

Number	A unique number that identifies the input group number used by the device.
Name	Enter up to 32 characters of the input group description.
GroupType	The type of group this is. Use the values from devices Type.
RCOS	The routing class for this group. This is used for input ID translation. Leave this set to zero to disable input ID translation.
AGProtocol	For AG-2000 boards this can be lps0 for Loop-start POTS or wnk0 for Wink-start (also Immediate) DID. For AG-4000 boards this can be wnk0 for Wink-start (also Immediate) 2-way DID, or ops0 for outdial (with or without Wink-start).
NumDigits	The number of digits to expect from an incoming call on a DID trunk. The DID trunk may be analog using the AG-2000 with DID module, or digital using the AG-4000 T1 board.
CallerID	In order to enable this the device must support caller ID. Currently caller ID is supported on incoming calls from analog POTS lines, modems that support caller ID, and digital Wink Start lines using ANI. This also requires caller ID or ANI service from the telephone company.

DistinctiveRing	In order to enable this the device must support distinctive ring. Currently this is only supported on incoming calls from analog POTS lines, and requires distinctive ring service from the telephone company.
TollSaverRings	The number of rings to play to the caller if the toll saver feature is enabled for the called mailbox and the mailbox does not have any new messages. With toll saver enabled the caller will not hear any rings when there is a new message.
NonTollSaverRings	The number of rings to play to the caller if the toll saver feature is not enabled for the called mailbox.
StartSupervision	T1 bit value for start supervision. Can only be used when AG Protocol is set to nocc.
GoaheadSupervision	T1 bit value for goahead supervision. Can only be used when AG Protocol is set to nocc.
AnswerSupervision	T1 bit value for answer supervision. Can only be used when AG Protocol is set to nocc.
HangupSupervision	T1 bit value for hangup supervision. Can only be used when AG Protocol is set to nocc.
AGInitDigitTimeout	Value in milliseconds to wait after seizure for the first digit to come in on a DID trunk using the wnk0 protocol.
AGSecDigitTimeout	Value in milliseconds to wait after initial digit for each additional digit up to NumDigits on a DID trunk using the wnk0 protocol.
AGPreHookFlashTime	Value in milliseconds to wait before sending hook flash on mbtree transfers (ie. TFR and TFB).
AGPostHookFlashTime	Value in milliseconds to wait after sending hook flash before sending digits on mbtree transfers (ie. TFR and TFB).

AGHookFlashTime	Value in milliseconds to send hook flash. Used by mbtree transfers.
AGWaitAnswer	Time in seconds to wait for remote answer on dialout.
DTMFOnQualTime	Time in milliseconds before a DTMF tone is considered valid. Normally 55. Allowable values are 5 to 32767.
DTMFOffQualTime	Off time between DTMF tones in milliseconds. Normally 35. Allowable values are 5 to 32767.
DTMFOnQualAmpl	Level in dBm for a DTMF tone to be recognized. Normally -36. Allowable values are -51 to 15.
DTMFOffQualAmpl	Minimum level in dBm to maintain recognition of a DTMF signal once recognition has started. Normally -43. Allowable values are -51 to 15.
AGRecordGain	Gain applied to signal before it is recorded. If AGC is enabled this is the initial gain when recording starts. Normally 0. Allowable values are -54 to 24.
AGSilenceAmplitude	The maximum signal level that is considered to be silence. Normally 0. Allowable values are -51 to -15.
AGEnableAGC	Enable automatic gain control Normally enabled.
AGNoVoiceTime	The maximum length of silence (in ms) at the beginning of a recording before recording is stopped with CTA_REASON_NO_VOICE. Default is 5000. 0 disables.
AGSilenceTime	The maximum length of silence after audio energy has been detected before record is stopped with CTA_REASON_VOICE_END Default is 3000. 0 disables.

PreWinkTime	Time in milliseconds after receiving connection before we send a wink.
WinkTime	Amount of time in milliseconds to wink.

7.6 outgrp

The Output Group Maintenance option provided on the System Administration menu allows you to define which output ports are grouped together to deliver messages. You identify the port and protocol to be used to send out the messages. Multiple outgoing modems can be grouped together so that the first available modem is used for dialing out TAP calls.

7.6.1 Fields

Group	A unique number that identifies the output group number used by the dialtype. For example, 1 may represent the group used to deliver TAP messages, 2 may represent the group used to deliver emails, etc.
Enabled	Entry in this field enables the output group.
Name	Enter up to 32 characters of the output group description.
Device	Specify the output device. This device must exist in the devices table.
Order	Specifies the order to try the devices. Each record in an output group must have a unique order. If the record with the lowest Order for the specified output group is busy the next record in order is tried until an available device is found.

7.7 user

The User Information Maintenance option provided on the System Administration menu allows you to identify web administrators. A user must be defined to allow access to the administrative web pages.

7.7.1 Fields

UserID	A unique User ID of up to 16 characters
UserName	The User's name. A maximum of 32 characters is allowed.
Password	The password associated with the user. Maximum is 16 characters
SecurityLevel	The security level associated with the password. <ul style="list-style-type: none"> 0 No Access 1 Send page 5 View real-time stats 10 Lookup subscribers 20 Add subscribers 30 Update subscribers 40 Delete subscribers 50 Reseller access 60 Administrator 255 Unlimited
BadLoginAttempts	Stores the current number of bad login attempts for this user. If this value reaches the MaxLoginAttempts access for this user will be disabled until an administrator resets the BadLoginAttempts to 0. Once the user logs in successfully this counter is reset to 0.
MaxLoginAttempts	Maximum number of bad login attempts the user is allowed before access is disabled.
AccountNumber	Restrict user to only viewing mailboxes with this account number. Used for reseller web administration access.

7.8 tnpprout

The TNPP Route Maintenance option provided on the System Administration menu allows you to define the route to which the TNPP packets will be routed.

7.8.1 Fields

TnppDest	The TNPP destination address to which the packets are to be sent.
Status	Status of this route entry. Valid values are: 1 On-line 2 Off-line 3 Fault-off
Device	The device to which the packets are to be sent.
RemapSource	If yes, uses NewSrc for the TNPP source ID. Otherwise is uses the existing source ID.
NewSrc	Used for remapping the TNPP source packet.
RemapDest	If yes, uses New destination for the TNPP destination ID. Otherwise is uses the existing destination ID.
NewDest	Used for remapping the TNPP packet being sent.
RemapInertia	If yes, uses New inertia for the TNPP inertia. Otherwise is uses the existing inertia.
NewInertia	Specify a different inertia for the outgoing packet.
RemapRFZone	If yes, uses New RF zone for the TNPP RF zone. Otherwise is uses the existing RF zone.
NewRFZone	Specify a new RF Zone for the outgoing packet.
RemapRFChan	If yes, uses New RF channel for the TNPP RF channel. Otherwise is uses the existing RF channel.

NewRFChan	Specify a new RF Channel for the outgoing packet.
LogPacket	Log packets to billing logs.

7.9 idblock

The ID Block Maintenance option provided on the System Administration menu allows you to define ranges of incoming numbers for delivery to a common output. Incoming Ids which belong to more than one block will be accepted by the smallest block which includes the ID. If the blocks are the same size the lowest numbered block will be used.

After finding a match the incoming number can be transformed by different methods. First, if StripChars is specified and they match the beginning of the incoming number those digits matching will be stripped. If StripChars is not specified and StripLen is, the number of digits in StripLen will be stripped from the beginning of the incoming number. Next if there are digits in Prefix they will be prepended to the incoming number and any digits specified in Append will be appended to the end of the incoming number. The maximum length of the resultant number must be 16 or less. If there are more Prefix digits than will fit the Prefix will be truncated to make the resulting number less than 16 digits long. After that if the Append string will cause the digits to be more than 16 the Append digits will be truncated so that the resulting digits will be less than 16.

7.9.1 Fields

Number	A unique identifier for this ID block.
Name	A descriptive name for this ID block.
Enabled	Specifies whether this ID block is enabled to accept incoming connections with an ID in this range.
IDStart	Starting number for this ID block.
IDEnd	Ending number for this ID block.
DialType	Specifies outgoing dialtype to use for message notification. Used for data connections only.
LCOS	Specifies which LCOS to use for limiting service for a number in this ID block.
TNPPDest	This field specifies the TNPP destination. If the dialtype specified above is a TNPP dialtype, all outgoing pages for this idblock will be sent to this destination based on routing entries in tnpprout.
Prefix	Digits to prepend to the incoming ID.
StripChars	Digits to strip from the beginning of the incoming ID. The system will strip the digits only if they exactly match the digits of the beginning of the incoming ID.
StripLen	If StripChars is empty and this field is set to a number greater than zero, the corresponding number of digits will be stripped from the beginning of the incoming ID.
Append	Specify the digits to be appended to the end of the incoming ID.
PageFields	Specify the fields of the email to send to the pager. Normally this is FSB for From, Subject, and Body.

FCOS	Specifies which FCOS to use. This allows restricting incoming email service to certain subscribers. Specifying an FCOS that does not allow email service and creating the individual subscriber (in mailbox) allows you to restrict incoming email service to only allow paying subscribers.
RCOS	Routing class to use for incoming telephone calls. This serves the same purpose as the RCOS field does for mailbox when the incoming call is for a mailbox instead of an idblock.
FromFormat	Format of the email paging from header. 0=email address or 1=quoted name.
RemotePort	Port in the remotedb database for remote lookups. As of version 2.8.1 we now support using a Glenayre GL3000 v6.1 paging terminal as a subscriber database. See section on remotedb for more information.

7.10 ipfilt

The IP Filter option on the System Administration menu provides a very powerful means to define IP address access permissions. For a given filter number you may have multiple records. Each record may be an allow or deny. If you have defined an IP filter for a server such as `smtpd` and do not create any `ipfilt` records all connections for that service will be blocked. If deny records exist and the IP address matches, the connection will be blocked. If allow records exist and the IP address matches, the connection will be allowed. If only deny records exist and the IP address does not match, the connection will be allowed. If only allow records exist and the IP address does not match, the connection will be blocked. If both allow and deny records exist and the IP address does not match the connection will be blocked (this isn't very useful, you could just specify the allows and get the same effect).

IP filters also can control how many connections in a certain time period are allowed and how long connections from that IP address will be disabled if the limit is exceeded. Typically this will be done by creating a filter with any deny entries you may have and creating an allow entry with `*` as the Pattern and specifying values for the `MoreThan`, `InTime`, and `DisableFor` fields. Setting `MoreThan` to 0 will disable this checking.

As of version 2.7.1 IP filter patterns may now also be Sender Email addresses. A new field `Restrict` controls whether this pattern should be applied to IP addresses or Sender email addresses.

As of version 2.7.6 IP filter patterns may also be the first 80 characters of the message data. Set `Restrict` to `D` to restrict by data.

A side effect of using `ipfilt` for input throttling (see second paragraph in this section) was that a specific allow entry may not always override a wildcard allow entry. This made it problematic to support different throttling limits for specific customers. As of version 2.8.8 multiple throttling records are now supported. Create a wildcard `ipfilt` record to set the default throttling limits for the particular filter number. Then create another `ipfilt` record with the same filter number for a specific IP address or email sender and specify different throttling limits.

7.10.1 Fields

Number	A unique identifier numbered between 1 and 65535.
Type	A for allow, D for deny
Restrict	Specify I to restrict IP addresses, S to restrict Sender email addresses, or D to restrict based on the first 80 characters of the incoming message.
Pattern	<p>Remote IP address to match. You must specify all 4 parts of the IP address. To match any address in a particular class C, use 0 as the last octet. For example, to match any address in 204.123.67.xxx use 204.123.67.0 as the pattern. This continues up also. To match any address in a particular class B use 0 as both the 3rd and 4th octet. For example, 172.123.0.0. A class A can have 0 as the 2nd, 3rd, and 4th. For example, 12.0.0.0. To match any IP address use *.</p> <p>This now also specifies the sender email address. Typically this will just be * to match all email addresses and values for MoreThan, InTime, and DisableTime will be entered below.</p> <p>Up to 80 characters may be entered for the Pattern.</p>
MoreThan	If more than this number of connections from the remote IP address matching Pattern during InTime seconds are received connections will be blocked for DisableFor seconds. Set this value to 0 to disable checking.
InTime	The amount of time in seconds to track the number of connections from a single source matching Pattern.
DisableFor	The amount of time in seconds to disable connections from a remote IP address matching Pattern.

7.11 dnsbl

The DNS blocklist option provided on the System Administration menu allows you to define servers to check for spam blocking.

We support both free and fee-based DNS lists. An example of a free list is `http://ordb.org` or `http://spamhaus.org`. The most popular group of DNS lists is from `http://mail-abuse.org` which is now a pay-for service.

7.11.1 Fields

Host	The host name of the DNS-based blocklist server.
Enabled	Enable lookup for this entry.
RejectLevel	Error code to return. Usually 550.
RejectString	Error string to return
ExpireTime	Number of seconds to cache the results of the DNS lookup. This is used to reduce the number of queries against the remote DNS blocklist server.

7.12 tnppfilt

The TNPP filter option allows you to define which packets are allowed and also remapping based on the incoming port.

The default packet action is now specified by the `TnppFilterDefault` field in devices. To block a certain type of packet, check the filter box, enter a pattern to match, and leave allow unchecked. In order to remap a packet check remap, and enter the new value for the entered pattern. If the the filter box is checked the pattern must match for the packet to be remapped. As long as there are no denies for a particular `tnppfilt`, all the remaps for that filter are applied. For example, `tnppfilt 1` could have a filter defined for channel and zone and another record created for particular TNPP source. As long as both records matched the incoming packet and there wasn't a deny. Both the channel/zone remapping and the source remap would be applied.

There are now checkboxes for Block Type, Pager Type, and Pager Class. This will allow combinations of types to be specified without needing to create a separate `tnppfilt` entry for each type.

7.12.1 Fields

Number	Filter number. This is the number that will need to be entered in the devices table to enable this filter for a particular device.
Description	A description for this filter.
FilterBlockType	Enable the block type filter.
MatchBlockType	The block type to match. This is now a bit mask of the different TNPP block types.
AllowBlockType	Allow or deny this block type.
FilterID	Enable the pager ID filter.
MatchID	The pager ID to match.
AllowID	Allow or deny this pager ID.

FilterCap	Enable the pager capcode filter.
MatchCap	The pager capcode to match.
AllowCap	Allow or deny this capcode.
FilterChannel	Enable the RF channel filter.
MatchChannel	The RF channel to match. Allowable values are 0 to 63.
AllowChannel	Allow or deny this channel.
RemapChannel	Enable remapping of this channel.
NewChannel	Replace the channel with this value if remapping is enabled.
FilterZone	Enable the RF zone filter.
MatchZone	The RF zone to match. Allowable values are 0 to 63.
AllowZone	Allow or deny this zone.
RemapZone	Enable remapping of this zone.
NewZone	Replace the zone with this value if remapping is enabled.
FilterFunction	Enable the function filter.
MatchFunction	The function to match.
AllowFunction	Allow or deny this function.
RemapFunction	Enable remapping of this function.
NewFunction	Replace the function with this value if remapping is enabled.

FilterPriority	Enable the priority filter.
MatchPriority	The priority to match.
AllowPriority	Allow or deny this priority.
RemapPriority	Enable remapping of this priority.
NewPriority	Replace the priority with this value if remapping is enabled.
FilterPagerClass	Enable the pager class.
MatchPagerClass	The pager class to match. This is a bit mask of the different TNPP pager classes.
AllowPagerClass	Allow or deny this pager class.
RemapPagerClass	Enable remapping of this pager class.
NewPagerClass	Replace the pager class with this value if remapping is enabled.
FilterPagerType	Enable the pager type.
MatchPagerType	The pager type to match. This is a bit mask of the different TNPP pager types.
AllowPagerType	Allow or deny this pager type.
RemapPagerType	Enable remapping of this pager type.
NewPagerType	Replace the pager type with this value if remapping is enabled.
FilterSource	Enable the TNPP source filter.
MatchSource	The TNPP source ID to match.
AllowSource	Allow or deny this TNPP ID.

RemapSource	Enable remapping of this TNPP ID.
NewSource	Replace the TNPP source ID with this value if remapping is enabled.
FilterDest	Enable the TNPP destination filter.
MatchDest	The TNPP destination ID to match.
AllowDest	Allow or deny this TNPP ID.
RemapDest	Enable remapping of this TNPP ID.
NewDest	Replace the TNPP destination ID with this value if remapping is enabled.

7.13 rcos

Routing Class Of Service (RCOS) allows restrictions to be placed on outgoing calls. Each mailbox or idblock can have an RCOS which defines the different allowable outgoing calls. For example an RCOS could be setup to only allow local calls, another could be setup to allow long distance or international calling. Up to 65535 different routing classes are supported.

7.13.1 Fields

Number	A number to identify this routing class. Allowable values are 1 to 65535.
Name	A descriptive name for this routing class. May be up to 32 characters.
Type	Values may be A for allow, or D for Deny. This will allow or deny the call based on the Pattern below.
Pattern	Pattern to match up with outdial string. In order to match the outdial string and the pattern must be the same length. To specify any digit use a ?. For example to match any 7 digit number use ???????. To match a specific digit enter the digit in the appropriate space in the pattern. 467???? will match any 7 digit number in the 467 exchange. 1800??????? will match any 800 number. In some areas the 1 before a long distance number is optional. In this case 800??????? will match any 800 number. Use whatever is appropriate for your area. May be up to 32 characters.

Prefix	Digits to prefix to outdial string if the above Pattern matches. This field can be up to 32 characters.
StripChars	If the outdial string matches this string of characters and the above Pattern matches the characters will be stripped. This field can be up to 32 characters.
StripLen	Number of characters to strip from the beginning of the outdial string if the above Pattern matches. This field is ignored if Strip Chars above is used.
DialType	Dialtype to use to send this outgoing call.
Append	Append these characters to the end of the outdial string. This field can be up to 32 characters.

7.14 virthost

The virthost table allows virtual hosts to be defined. These virtual hosts control which sub-directory under www to use for displaying the web pages and also which email domains the system will accept messages for.

7.14.1 Fields

Name	An up to 80 character name for this virtual host.
Enabled	Enable or Disable this virtual host.
RequireLogin	Not currently used.
Directory	The sub-directory under www to use for the web pages.
MainLogo	An alternative logo to use for this host. This only affects the subscriber web page logo.
MainHref	An alternative web site address to go to when the logo is clicked. This only affects the subscriber web page logo.
SendpageIdname	The name of the pager ID field on the Send a Message web page. If this is left blank "pin" will be used.
SendpageMessagename	The name of the message text field on the Send a Message web page. If this is left blank "message" will be used.
EnableEmail	Specify whether to accept email for this domain.
MaxRecipients	The maximum number of recipients to allow in a single session for this virtual host.
MaxSequential	The maximum number of sequential recipients to allow in a single session for this virtual host.

WebMessagesSent

A counter for how many pages have been sent through this virtual host.

7.15 remotedb

remotedb allows the Omega to use a remote database for subscriber lookups. This is where the connection and protocol information for using the remote database would be defined. Currently only the Glenayre GL-3000 running version 6.1 software is supported. Other versions of Glenayre can easily be supported. Please contact us for connecting to other devices with a computer interface.

The remote connection may be either over a direct RS-232 link or over Ethernet using TCP/IP sockets. Up to 65535 remote databases are supported and the system is designed to support different protocols simultaneously (each on its own port of course).

To keep the traffic on the computer interface link to a minimum a cache is employed to cache each remote lookup for a configurable amount of time. This time limit is specified in seconds and may be up to 65535 seconds (18.2 hours). See `CACHE_EXPIRE_TIME` in the [remotedb] section of `omega.ini`.

7.15.1 Fields

Number	A number to identify this entry. Allowable values are 1 to 65535.
Name	A descriptive name for this remote database entry. May be up to 32 characters.
Status	Status of this port. Valid values are: <ol style="list-style-type: none"> 1 On-line 2 Off-line 3 Fault-off
Type	Type of device. Valid values are: <ol style="list-style-type: none"> 1 Serial 2 Network
Protocol	Protocol to use to communicate with the remote database. Currently only 4 for Glenayre Computer Protocol is supported.

ComPort	The name of the RS-232 port to use for RS-232 connections. For example, COM17 or DIGIA08. Maximum length is 16 characters.
Baud	Baud rate to use for RS-232 connections.
Parity	Parity to use for RS-232 connections. Typically E (for Even) or N (for None).
DataBits	Data bits to use for RS-232 connections. Typically 7 or 8.
StopBits	Stop bits to use for RS-232 connections. Typically 1.
Host	Remote host name to use for TCP/IP connections. This can either be an IP address or a fully qualified domain name (FQDN). This field has a maximum of 80 characters.
Port	TCP/IP port number of remote computer interface server.
Username	Username for remotes that require a login. May be up to 16 characters.
Password	Password for remotes that require a login. May be up to 16 characters.
InitTimeout	Time in milliseconds to wait for the initial read of data on the connection.
SecTimeout	Time in milliseconds to wait for additional data to be read once we have started reading data from the remote.
ConnectTries	The number of times to attempt connection to the remote before reporting an error.
ConnectInterval	Time in milliseconds to wait between connection attempts.

LinktestTries	The number of times to attempt link tests to the remote before reporting an error.
LinktestInterval	Time in milliseconds to wait between link test attempts.
Version	Up to 8 character description of the version. For example, 6.100. This field is used and must match the version of the remote paging terminal.
SystemID	Up to 8 character description of the system id. Not currently used, informational field for now.
ItemCode	Up to 16 character billing code. Not currently used, informational field for now.
NumericLengthArray	An array of 16 integers representing the numeric pager lengths in the remote paging terminal. For example, the Glenayre (version 6 and above) allows 16 different numeric pager maximum lengths and returns a number in the computer interface that correlates to the entry in this array.
AlphaLengthArray	An array of 16 integers representing the alpha pager lengths in the remote paging terminal. For example, the Glenayre (version 6 and above) allows 16 different alpha pager maximum lengths and returns a number in the computer interface that correlates to the entry in this array.
CustomLengthArray	An array of 3 integers representing the custom voice message lengths in the remote paging terminal.

Chapter 8

Subscriber Databases

The following section discusses the functionality provided by the Subscriber Administration option. This option allows you to maintain the mailboxes referenced within Omega, including all pagers on the mailboxes, mailing lists, and messages.

The databases described in this section are available from the Subscriber Maintenance menu in dbmaint and also from the Subscriber Maintenance menu in the web-based administration menu.

Each database is described along with any allowable values and limits for that field.

8.1 mailbox

The Mailbox Maintenance option provided on the Subscriber Administration Menu allows you to maintain the mailbox information for each subscriber. Individual feature and limit setting may be defined for each mailbox. In addition, you can specify a cascading number or copy to a mailbox.

8.1.1 Fields

MailboxNumber	The subscriber's mailbox number.
EmailAlias	If the user name portion of an incoming email does not match the mailbox number listed above, this field is checked for a match. This makes it possible to send a message to david@pager.example.com and have it stored in mailbox 1234567, instead of having to specify 1234567@pager.example.com.
Contact	Up to 32 characters may be entered as the contact name.
Phone	The phone number at which the contact may be reached. Up to 16 digits may be entered.
AccountNumber	The subscriber's account number for billing purposes. A number between 0 and 99999999 may be entered.
Passcode	A four to eight digit passcode used to protect the mailbox from unauthorized changes. This can be changed at any time by the subscriber from any touch-tone phone.
Valid	Specifies if this mailbox will accept incoming calls. This allows a voice mail provider to temporarily invalidate a non-paying subscriber. Valid codes include Y (Yes) or N (No).
InUse	This field is for internal use only.
BadTelAttempts	Tracks bad login attempts from incoming telephone calls. A value between 0 and 255 may be entered.
MaxTelAttempts	A value between 0 and 255 may be entered. If the bad login attempts from the telephone exceeds the value entered in this field, the mailbox is marked invalid to prevent brute force break-ins. If this number is exceeded, the subscriber must call your office to have the mailbox re-enabled.

BadWebAttempts	Tracks bad login attempts from the World Wide Web (WWW) interface. A value between 0 and 255 may be entered.
MaxWebAttempts	A value between 0 and 255 may be entered. If the bad login attempts from the World Wide Web exceeds the value entered in this field, the mailbox is marked invalid to prevent brute force break-ins. If this number is exceeded, the subscriber must call your office to have the mailbox re-enabled.
FCOS	This selects the Feature Class of Service to be used by the mailbox. A value between 1 and 65535 may be entered. Refer to Section 5 for details.
Feature1	The service features associated with the number entered in this prompt are copied from FCOS (when the mailbox was first created).
Feature2	The mailbox features associated with the number entered in this prompt are copied from FCOS (when the mailbox was first created).
Feature3	The Modify features associated with the number entered in this prompt are copied from FCOS (when the mailbox was first created).
Feature4	Reserved for future expansion.
LCOS	This selects the Limits Class of Service used by the mailbox. A value between 1 and 65535 may be entered. Refer to Section 5 for details.
DeliveryType	The dialtype used for message delivery.
IncomingCalls	Specifies the number of guest calls that the mailbox has received since the counter was last reset.
CharacterCount	The number of characters received (total of numeric, alpha, and email).

MessageCount	Number of messages received (total of voice, numeric, fax, alpha, and email).
IncomingAllow	Incoming call allowance for count down mailboxes. If this number is 0, count down is disabled.
CharAllow	Character allowance for count down mailboxes. If this number is 0, count down is disabled.
MsgAllow	Message allowance for count down mailboxes. If this number is 0, count down is disabled.
IncomingDec	This is the actual count down counter. This is reset to IncomingAllow by <code>vm bill -r</code> at the end of the month or by <code>vmcdreset</code> if enabled. When this number goes to 0, no more incoming calls are allowed.
CharDec	This is the actual count down counter. This is reset to CharAllow by <code>vm bill -r</code> at the end of the month. When this number goes to 0, no more incoming characters are allowed.
MsgDec	This is the actual count down counter. This is reset to MsgAllow by <code>vm bill -r</code> at the end of the month. When this number goes to 0, no more incoming messages are allowed.
CallerPasscode	An optional, up to 8 character passcode the caller must enter to leave a message for the subscriber.
CopyTo	Enter another mailbox ID to copy the messages from this mailbox to.
ForwardTo	A mailbox number may be entered to forward incoming callers to. The called mailbox greeting will be played first, then the forward to mailbox. At that point the caller will have the options that they would have had if the called the forward to mailbox directly. This is most useful for the subscriber going on vacation, or other business, and having another subscriber handle their calls. Because the original mailbox greeting is played first the subscriber should record a greeting like “Hello you have reached ..., I am currently unavailable. Please hold while you are transferred to ...”.

RCOS	Routing class of service. Specifies the allowable outdial numbers for this mailbox.
KeyMap	Select one of the available telephony user interface keymaps. <ol style="list-style-type: none">1 Omega2 Trilogue
GreetingNumber	The Omega emulation supports multiple greetings. The subscriber can record several greetings and switch between them at will, or by time based steering (see Section 6.6). The number of different greetings can be limited using the MaxGreetings field in lcos, up to a system limit of 99 greetings per mailbox.
Language	Language to play voice prompts in. Currently on English is supported.
Repetitions	The number of times to repeat the menu for menu tree mailboxes.
Timeout	The amount of time in seconds to wait for the caller to press a digit on a menu tree.
AlphaEnabled	Enable or disable alpha transcription.
AlphaStart	Time of day in 24 hour time to send messages to the queue to be transcribed.
AlphaEnd	Time of day in 24 hour time to stop sending messages to the queue to be transcribed.
FaxSID	Fax SID to send to remote fax machine when sending faxes.
TreeConditionDigits	Number of digits to allow for tree menus. This may be from 1 to 16. Typically it is 2. Any input on a menu tree greater than this value is considered to be another mailbox number.

SwitchDigits	Digits to outdial for switch connections. Not normally used. May be up to 16 digits.
LoginDigit	This should be set to a single DTMF digit to be used as the login digit. Normally this is *.
SendToList	If this number is greater than 0 and refers to a distribution list setup for this mailbox, any incoming voice, fax, or numeric message will be sent to all members of that list.
CascadeDisposition	Allowable values are C to copy a message when it cascades to another mailbox, or M to move the message. Copying a message will leave a copy in the original mailbox, whereas moving a message will remove the message from the original mailbox after copying it to the new mailbox.
MWIONType	The dialtype to use for signalling a Message Waiting Indicator.
MWIOffType	The dialtype to use for turning off a Message Waiting Indicator.
MWINumber	An up to 8 character number to send to the Message Waiting Indicator.
CallTime	The amount of time, in seconds, this mailbox has accumulated since the counters were last reset.
CallAllow	The amount of time, in seconds, a mailbox is allowed to have before incoming calls are blocked.
CallDec	The current amount of time, in seconds, a mailbox has left before incoming calls for it are blocked.
CounterResetStamp	Contains the date and time the counters were last reset with the vmbill program.
TimeZoneOffset	The number of hours west of GMT/UTC. For example, Eastern Standard Time (EST) is 5. This is used so the customer can receive the times in the time zone they are setup for. This allows a system based in one time zone to serve customers in another time zone while the customer hears (and sees) the times in their own local time.

DaylightSaving	Specifies whether daylight saving time is observed at the customers location. Should be specified with TimeZoneOffset above.
MaxTrunks	The maximum number of voice trunks a specific mailbox can be using at any particular time. This allows the system to limit the number of trunks a high volume user can use simultaneously.
MaxTrunkPercentage	This specifies a percentage from 1 to 99 (0 and 100 indicate the subscriber is allowed to use any percentage). If the percentage of idle trunks (in comparison with total trunks in the system) drops below this percentage the subscriber is not allowed any additional calls until their number of calls drops below the idle trunk percentage.
EnableTutorial	Enable the new user tutorial. If this is enabled and the FCOS also has enable tutorial enabled. A new subscriber will be guided through setting up their greeting, name, and passcode. Once they have completed the tutorial this flag will be set to disabled so they don't have to go through the tutorial every time they login. It can be re-enabled at any time through the admin interface. Also, a report can be run reporting all mailboxes that have not yet completed the tutorial.
AllowSource	Allows the definition of which input sources to allow for this mailbox. Add the values together for the input source you wish from the list below.

- 1 Telephony
- 2 GCP
- 4 HTTP
- 8 OIM
- 16 SMPP
- 32 SMS
- 64 SMTP
- 128 SNPP
- 256 TAP
- 512 TNPP
- 1024 TRANS
- 2048 WCTP

8.2 mbpage

The Mailbox Pager Maintenance option provided on the Subscriber Administration Menu allows you to maintain the pager information for each mailbox. Multiple pager entries are supported for each mailbox.

When a new message comes in, a lookup is done in Order number order. If the lowest numbered order (entries do not have to start with the number one or be any particular number) qualifies, then a pageque record is created to store the paging information for the vmpage program to act on. If the lowest numbered entry does not qualify each entry is checked in Order number order. When a qualifying entry is found, a pageque record is created. If no qualifying entry is found then no pageque will be created and the message will not be paged out. In this case the next message that comes in will also go through this whole procedure to see if it can be paged out.

There are a few tests that must be passed before a message is considered for paging. First, there has to be an mbpage record for the mailbox. Second, the message class has to be checked against the notification field. If notification was set to Urgent and a Normal message came in, the message would not be paged on this entry and the system would check the next entry to see if it qualified. Next the message type is checked against the MsgType mask. If the appropriate bit is not set the pager entry is ignored. Last, the message is checked against the start and end times for this mbpage entry. If the message came in outside the range allowed it would not be considered for this mbpage entry.

Once a message is in pageque, the vmpage program will page it out until the number of tries have run out. Then the vmpage program looks up in mbpage to see if there are any higher numbered entries that it can check to see if the message needs further action on. If there are no more qualifying mbpage records, the mailbox is checked to see if the message should be cascaded to another subscriber.

8.2.1 Fields

MailboxNumber	The mailbox number to which the pager entry belongs.
Order	This specifies the order in which to try the pagers. If multiple entries exist with the same order, they will be paged based on the start and end times.

Serial	Used to make the key unique. This number needs to be incremented for each pager with the same Order number.
PagerModel	The model number of the pager. This is an informational only field.
PagerSerialNumber	The serial number of the pager. This is an informational only field.
MessageType	Valid codes include N (Numeric), V (Voice), F (Fax), A (Alpha), and E (Email). Combinations are supported.
PageFields	Specify the fields that must be sent from within an email. Valid codes include F (From), T (To), S (Subject), and E (Email).
Enabled	Specify if the pager is enabled (Y) or disabled (N).
Notification	Specify what types of messages on which this entry will page. 0 Normal 2 Confidential (fax messages) 4 Urgent 8 Reply requested
DialType	Specify the dialing type for this pager.
DialNumber	Specifies the capcode of the pager if cap paging is used, or the ID of the pager if ID paging is defined for this record. This field may also contain an email address for sending messages via email.
Tries	Specify the total number of tries for this pager. The pager will be paged this many times using Interval below until message is marked played.
Interval	Specify the interval before the next page attempt. When on the last page attempt, this number is used to specify the time before the next mbpage entry is used to page out the pager (to give the current pager one last time to login and play the message).

PagerDays	Specify the days of the week on which the pager is to be paged.
PagerStart	Specify the start time that this pager is active. This is specified as HHMM where HH is a two digit hour (for example, 02) and MM is a two digit minute (for example, 04). 0000 is 12am and 2359 is 11:59pm. It is possible to specify that the same pager is to be paged at two different time intervals by creating two mbpage records, each with its own start and end time.
PagerEnd	Specify the end time that this pager is active. This is also specified as HHMM where HH is a two digit hour (for example, 02) and MM is a two digit minute (for example, 04). 0000 is 12am and 2359 is 11:59pm.
FromFormat	Format of the email from header. 0=email address, 1=quoted name
VoiceFormat	Specifies the format of the voice attachment to a message delivered via email.
OutgoingCalls	Outgoing call count.
CharCount	Outgoing character count.

8.3 mldata

The Mailbox Message Maintenance option provided on the Subscriber Administration Menu allows you to maintain the message data information for each mailbox.

8.3.1 Fields

MailboxNumber	The mailbox number to which this entry belongs.
LineNum	Specifies the line number on which the message came in. This is used to help create a unique filename for the voice and/or fax file.
MsgNum	Specifies a unique message number for the line on which the message came in. This is also used to help create a unique filename for the voice and/or fax file.
Status	The current status of the message. Valid values are: 1 New 2 Played 4 Deleted 8 Future delivery 16 List 32 Text-to-speech
Type	The type of message. Combinations are supported. Valid values are: 1 Voice 2 Numeric 4 Fax 8 Alpha 16 Email

Class	Specifies the class of message. Not all message classes are supported by all emulations. Valid values are: 0 Normal 2 Confidential (fax messages) 4 Urgent 8 Reply requested
Received	The date and time that the message was received.
Played	The date and time that the message was played.
Deleted	The date and time that the message was deleted.
VoiceLength	The length in seconds of the voice part of the message.
FaxPages	The number of pages in the received fax.
NumChars	The number of characters in the numeric portion of the message.
AlphaChars	The number of characters in the alphanumeric portion of the message.
EmailChars	The number of characters in the email portion of the message.
Sender	Specifies the mailbox number of the message sender if the message was sent from another mailbox on the system.
SenderIP	Contains the IP address of the client sending the message.
CalledID	Contains the number the caller dialed. This can be used for remapping the source TON and NPI for SMPP based on the called number.

CallerID	Contains the Caller ID phone number information for this message.
CallerName	Contains the Caller ID name information for this message.
PagerData	Stores the numeric digits entered by a caller. Maximum length is 32 characters.
SequenceNumber	Used by the alpha transcription software.
Comment	An up to 32 character comment that can be stored with the message. This is used through the web interface so the subscriber may enter a short comment to remind them what the message was about without having to play it.
PreserveFormat	Enabled if preserve format is used in a message received via SNPP or WCTP.
BinaryData	Enabled if binary data is received via WCTP.
From	The From: header of an incoming email. Maximum length is 80 characters.
To	The To: header of an incoming email. Maximum length is 80 characters.
Subject	The Subject: header of an incoming email. Maximum length is 80 characters.
Repeats	Send the message this number of times.
MimeAttachments	Append [MIME Attachments] to the end of the alpha page if there were MIME attachments on the incoming email.

8.4 mbemail

The Email Filter Maintenance option allows you to maintain the email filters for each mailbox.

8.4.1 Fields

MailboxNumber	The mailbox number to which this entry belongs.
Enabled	Specify if the filter is enabled (Y) or disabled (N).
If	Contains the condition to match. May be one of Sender, Subject, Body, Priority, To, CC, or To or CC.
Verb	Specifies how the condition matches. May be one of Contains, Does not contain, Begins with, or Ends with.
String	Contains the pattern to match. This may be up to 80 characters long.
Action	Allow or Deny

8.5 timestr

Time steering controls what happens when a call to a mailbox occurs within a specified time period. The call can either be directed to another mailbox, or a different greeting can be played.

8.5.1 Fields

MailboxNumber	The mailbox number to which this entry belongs.
Enabled	Specify if the entry is enabled (Y) or disabled (N).
Day	Day of week to match. Valid values are 0-6 for Sunday through Saturday, 7 for weekdays, 8 for weekend, 9 for holidays as described in the holiday table (see section 6.7), or 10 for all days.
StartTime	The start time for this entry in 24 hour time. Allowable values are 0000 to 2359.
EndTime	The end time for this entry in 24 hour time. Allowable values are 0000 to 2359.
Destination	The destination mailbox to route the call to.
GreetingNumber	If the Destination above is left blank, a greeting number can be entered here to play a different greeting from the default based on the time of day.
MaxTrunks	The maximum number of voice trunks a specific mailbox can be using at any particular time. This allows the system to limit the number of trunks a high volume user can use simultaneously.
MaxTrunkPercentage	This specifies a percentage from 1 to 99 (0 and 100 indicate the subscriber is allowed to use any percentage). If the percentage of idle trunks (in comparison with total trunks in the system) drops below this percentage the subscriber is not allowed any additional calls until their number of calls drops below the idle trunk percentage.

8.6 holiday

Specify holidays for a particular mailbox.

8.6.1 Fields

MailboxNumber	The mailbox number to which this entry belongs.
Month	Month of the holiday.
Day	Day of the holiday.
Description	Description of the holiday.

8.7 mblast

Mailing lists for mailboxes.

8.7.1 Fields

MailboxNumber	The mailbox number to which this entry belongs.
ListNumber	Allowable values are 1 to 99.
Member	A mailbox number that belongs to this list.
Order	The order of the entry in this list. This is used for the contacts web page and allows sorting of the entries in the list.

8.8 mbtree

Contains the menu tree definitions for mailboxes.

8.8.1 Fields

MailboxNumber	The mailbox number to which this entry belongs.
Condition	The condition to be met to use this entry. Allowable values are I for invalid or mailbox doesn't exist, M for menu tree, U for unconditional or a DTMF digit string up to mailbox TreeConditionDigits long. In any case this field can not be longer than 16 characters.
Action	Action to performed when condition is met. Allowable values are X for disconnect, GO to go to another mailbox, TFR to do a supervised transfer to an extension, TFB to do a blind transfer to an extension, TFN to transfer without sending digits, or SWI to switch the call to another telephony port.

A call is transferred by doing a switch hook flash and then sending digits to the PBX or telephone switch to transfer to. Some systems call this a "qualified revert". Normally transferring (TFR) will do the switch hook flash and wait for a DTMF * before sending the digits, transferring blind (TFB) will do a switch hook flash and then the digits, and TFN just does a switch hook flash to revert to the PBX or switch. The amount of time before and after the switch hook flash, as well as the duration of the switch hook flash are configurable by device (see section 5.4).

A call can also be switched to another port using SWI. This does not require a PBX or other telephone switch to work. When this call is handled an available outgoing port is grabbed and the outgoing call is placed. When the call is answered the Omega will connect the incoming call with the outgoing call. When each end hangs up the call will be disconnected.

Destination

This is the destination of the action. If the action is GO, this the the mailbox number to go to. For TFR and TFB this is the extension to overdial. This field can also be one of the following:

Fx Collect x digits retaining the first
Sx Collect x digits skipping the first
Px-y Collect x digits prepending y

The F, S, and P destinations allow the caller to specify the destination. This is designed to work with the GO, TFR, and TFB actions. The system will collect up to x digits. For F this value can be between 1 and 31. For S this value can be between 1 and 32. For P this value is 32 minus the number of digits you wish to prepend. The F, S, and P options only work using native emulation (key map 1). If a number is not specified after the F, the system will collect 9 digits. If a number is not specified after the S, the system will collect 10 digits. There are no defaults for P both x and y are required. Y should be replaced with the actual digits to prefix.

The M condition allows mailboxes to also have menu trees enabled. This will allow a caller to press a digit and have some action performed. Usually a transfer to another extension or 0 for an operator. The action should be TFR or TFB to transfer out of voicemail or GO to send the call to another mailbox. The destination should be blank. The system will collect up to the number of digits specified in the TreeConditionDigits in the mailbox and transfer to that number.

8.9 mbalias

The Omega now supports defining multiple aliases per mailbox. The old method of specifying the email alias in the EmailAlias field of the mailbox table is still supported. However it is recommended that this table be used for future aliases as it allows multiple email aliases per mailbox.

8.9.1 Fields

Alias	The alias to define for a particular mailbox. This field may be up to 32 characters long. If using this for an email alias do not add the @domainname to the end of the alias.
MailboxNumber	The mailbox number to point this alias to.

Chapter 9

Program Descriptions

The following sections describe the executables that make up the Omega application. For Linux systems the base directory is `/opt/omega_ums`, for Windows it is typically `c:\omega`.

9.1 Introduction

The Omega programs can be separated into different groups.

- Programs that must always be running. This is `vmstart`.
- Programs that must be started depending on which services are to be enabled. For example, enable `tapd` for TAP protocol and `tnppd` for TNPP protocol. To enable incoming Internet email messages, `smtpd` must be started. To enable incoming Internet Simple Network Paging Protocol (SNPP) messages, `snppd` must be started. To enable the World Wide Web server, `httpd` must be started.
- Maintenance programs that don't need to be running all the time. These are `dbmaint`, `vmbill`, and `showstats`.

9.2 System programs

These programs must always be running for the system to operate.

9.2.1 vmstart

vmstart is the master program that starts all of the other processes and then monitors the processes. If a process exits for some reason, vmstart will restart it automatically.

9.2.2 syspage

syspage is the Omega alarm server. It accepts alarms on a TCP port and pages it out based on the rules in its configuration file. Please see the syspage manual for more information.

9.3 Protocol servers

9.3.1 tapd

Handles all incoming TAP protocol connections. The TAP protocol is supported on direct RS-232 connections, modem connections, and TCP connections. In order to accept incoming TAP connections from the internet the Host field needs to be empty signifying a server connection.

9.3.2 tnppd

Handles all incoming and outgoing TNPP protocol connections. Tnppd acts as a full TNPP router with packet remapping and filtering capabilities. The TNPP protocol is supported on direct RS-232 connections, modem connections, and TCP connections. Both client and server connections are supported.

9.3.3 httpd

httpd.exe is the World Wide Web server. This allows the service provider to offer alphanumeric paging from a web page and also gives subscribers the ability to check their messages or change certain configurations from their web browser.

This server also provides the web administrative interface and the WCTP server. See the Web Administration Section for more information. The WCTP server uses the URL of `http://wctp.yourdomainname.com/wctp` (replace `yourdomainname.com` with your internet domain name) to receive pages.

The web server now supports multiple virtual domains. In order to add support for this option entries need to be added to the `virthost` table to define what hostname in the `Host:` header to match and also which directory the web page templates are located in. For each unique hostname a sub-directory must be created in the

www directory. The name of the sub-directory is then entered in the Directory field in `virthost`. Copy the default web pages from the `www/default` directory to this sub-directory and modify the files in the new sub-directory for the new web site.

Omega needs a dedicated connection to the Internet to support this option. A 56K leased line or frame relay connection will support limited usage. Heavy usage will require more bandwidth.

9.3.4 `smtpd`

Handles all the incoming Internet email messages. The `smtp` server will parse the incoming email looking for voice and fax attachments and convert them into files that can be retrieved from a telephone or fax machine, or listened/viewed from the web. This conversion does require a specific format. The voice attachments need to be `.WAV` files and the fax attachments need to be `TIFF-F`. Numeric messages can be sent to numeric pagers by prefixing `numeric.` in front of the pager id (ie. `numeric.5551212@example.com`).

In order to receive email the email service domain name must be specified in `virthost` with the `Enable Email` field enabled. A `virthost` record needs to be created for each domain you wish to receive email.

Omega needs a dedicated connection to the Internet to support this option. A 56K leased line or frame relay connection will support limited usage. Heavy usage will require more bandwidth.

9.3.5 `snppd`

Handles all incoming Internet Simple Network Paging Protocol messages. SNPP is described in RFC 1861 <http://www.faqs.org/rfcs/rfc1861.html>.

In the command list below only the capitalized letters are needed for the command. For example, `MESS` or `MESSage` will enter the message for the pager. Also, these commands are not case-sensitive, both `MESS` and `mess` will enter the message. See the RFC for more information.

The SNPP RFC doesn't mention the maximum length of the incoming command. The Omega will accept up to 16384 bytes per line, some other SNPP servers may be limited to as little as 1024.

The Omega supports the following SNPP commands:

- PAGEr <pagerid>
- MESSage <message>
- RESEt
- SEND
- QUIT
- HELP

The following level 2 commands are supported:

- PAGEr <pagerid> [passcode]
- DATA
- HOLD <YYMMDDhhmm> [+/- GMT difference]
- CALLerid <callerid>
- SUBJect <subject>

9.3.6 pop3d

The POP3 server allows access to stored messages via a standard email client using the POP3 protocol. It is recommended that the POP client is configured to “leave messages on server” and “delete messages from server when deleted”.

9.3.7 gcpd

This program allows incoming messages using the Glenayre Computer Protocol. This can be used to accept input from the Hark TAP-2000.

The Omega also supports a limited computer interface using GCP. The following commands are supported:

- @RV This will return 6.100*.
- @PO page out
- @CR create record
- @RE read record
- @DR delete record
- @MR modify record

Other commands will return ?02 Unknown command. The lower-case versions of these commands are also supported. For example, the @CR command takes a two-digit field number for the key (e.g. @CR#01/) and the @cr command takes a three-digit field number for the key (e.g. @cr#001/).

This limited programming ability was added for billing systems which only support the Glenayre Computer Protocol. The functionality is limited as the Glenayre only supports one pager per number, so gcpd can only create a single mbpage record for the mailbox. The Omega computer interface (vmci) allows multiple mbpage records per mailbox.

9.3.8 vmci

vmci is the computer interface server. This allows access to the mailbox and mbpage tables from a billing or central programming computer. See the “Computer Interface” section in the “Database Maintenance” chapter for more information.

9.3.9 vmpage

Handles outgoing page processing. Calls for TNPP are passed to the tnppd program for routing. All other protocols (HTTP, SMTP, SNPP, SMDI, AIM, GCP, SMPP, TAP, and WCTP) are handled by individual threads in the vmpage program itself. Calls that need to outdial to a telephony trunk are sent to the vmail program for handling.

9.4 Maintenance programs

9.4.1 dbmaint

dbmaint is a text-based database maintenance program. This allows local administration and even remote administration over a telnet or ssh session. See the “Text based maintenance” in the “Database Maintenance” chapter for more information.

9.4.2 ShowStats

This program only exists on the Windows version. The Linux version uses rtview.

Each program that handles a particular protocol maintains an area in shared memory for statistics and inter-process communication. ShowStats allows one to view the current real-time stats. ShowStats can be run on the local computer, or remotely by accessing the information from the httpd process on the Omega. In order to view stats remotely a username and password must be used that has at least the stats security level.

The different shared memory segments can be viewed under the Window menu. The first, Programs, shows the shared memory area for vmstart the main service which starts and monitors the protocol programs. You can click on a program and click Action-;Stop to stop the application from running temporarily. Click Action-;Restart to restart a stopped program. Also, when monitoring the protocol programs, you can select a port and use Stop and Restart to stop and restart the port.

9.4.3 rtview

Real-time viewer displays statistics for each of the ports.

When first entering rtview a list of the currently enabled Omega applications is displayed. Some of these applications, such as the protocol servers, support pressing right-arrow to view the program threads.

The up and down arrows are used to move between ports. The space bar can be pressed to get more detail about the port you are currently on. Press space again to get back to the port list. Certain port setting changes will require a thread restart before the change takes effect. An example of this is changing the baud rate of a serial port. In order to minimize downtime, the Omega allows individual threads to be restarted so that the other ports may continue processing packets, while you make changes. To stop a thread, use the cursor navigation keys to highlight the thread you want to change. The press <F6> to stop the thread. You should see the status change to PAUSE and then to STOPPED. Once the thread says STOPPED, you may press <F7> to restart it. It is now possible to clear the stats for the current port. Just press the DEL key to clear the counters. To clear the stats for ALL ports, press <SHIFT>. If for some reason the screen gets out of sync, pressing <CTRL><R> will redraw the screen.

9.4.4 vmmaint

As of version 2.7.7 vmcdreset, vmfuture, vmlist, and vmpurge have been merged into vmmaint. Vmmaint resets count down counters in mailboxes with the Count-Down feature enabled. This can automatically be done on a daily or monthly basis. This program also scans the future delivery queue and delivers any future delivery messages, and scans the list queue and delivers any mailing list messages. Also each day at the CLEANUP_TIME specified in omega.ini, it scans the message database removing expired messages (see LCOS section) and messages scheduled for deletion. Also removes old IP session information and purges old debug logs. Vmmaint also scans the vm directory cleaning up any directories or files that no longer have a coinciding database entry.

9.4.5 vmbackup

The vmbackup program runs automatically each day at a configurable time and copies the existing databases to the BACK_CUR sub-directory. Additionally a copy is made in a directory named after the day of the week (e.g. BACK_MON). This allows for seven days worth of backups. After the backup is made the backup files are automatically rebuilt to clean up any deleted records.

9.4.6 monitor

Monitor system for programs and deliver alarms if needed. This monitors the size of the alpdisp queue, hard drive space, available memory, and any stale messages in pageque. The monitor program also monitors the status of the T1 circuits and can send alarms based on the T1 status.

9.4.7 showlog

Displays the billing log entries as they are added to the billing log file. When first started showlog will automatically go to the end of the file and start displaying new entries as they are added. To view the TNPP logs type:

```
showlog tnpp
```

9.4.8 sptest

The sptest program is for sending alarms via the syspage server. By default the sptest program will send a test alarm at error level 255. Or it can be used to send a specific message to the alarm server by passing in an argument. For example:

```
sptest "This is my custom test alarm message"
```


Chapter 10

Billing

Each call processing application creates and maintains its own billing log file. Voice calls are logged in `vmail.in.txt`, tap is in `tapd.in.txt`, tnpp is in `tnppd.in.txt`, http is in `httpd.in.txt`, snpp is in `snppd.in.txt`, and smtp is in `smtpd.in.txt`. Outgoing pages are logged in files named after the protocol used. For example, email out will be in `smtp_out.txt`, snpp will be in `snpp_out.txt`, etc. These files can be found in the `logs/YYYY/MM-DD` sub-directory of the Omega installation directory. For example, November 27, 2006 will be in `logs/2006/11-27`.

There are two variables to control the billing format and field configuration. These are `BILLING_FIELDS` and `BILLING_FORMAT`. Each program has its own settings for these fields in their respective section of `omega.ini`.

`BILLING_FIELDS` controls which logentry fields are written to the log file. This field can be up to 80 characters long. Not all tokens are supported by all protocols. The following are valid `BILLING_FIELDS` tokens:

n	MailboxNumber
f	Sender
F	Sender IP address
r	Status
y	Start year (uses 2 digit year if field width < 4)
m	Start month
d	Start day
h	Start hour
i	Start minute
s	Start second

Y	End year (uses 2 digit year if field width < 4)
M	End month
D	End day
H	End hour
I	End minute
S	End second
N	Dial number
T	Dial type
v	Device type
p	Device protocol
c	Item billing code
t	Message data (up to 128 characters)
b	Baud rate
l	Message length
P	Physical port
L	Logical port
o	TNPP source
e	TNPP destination
C	Capcode (or ID if TNPP ID packet)
E	Pager encoding format
a	Pager class (A=alpha, N=numeric, etc)
R	RF Channel
Z	RF Zone
+	Caller ID (a.k.a ANI) Called ID (a.k.a DNIS or DID)

BILLING_FORMAT specifies the locations and widths of each billing field. This field can be up to 512 characters long. Any non 'X' character is included in the billing record. The first character of each field is designated by an uppercase X and trailing characters by lowercase x's. The x's specify the width of each field in the billing record. Use a single uppercase X to output the field without padding or truncating. This is most useful for delimited files, otherwise extra characters (if wider than the specified billing width) are truncated.

Examples:

```
[smtpd]
BILLING_FIELDS=nfrhislLt
BILLING_FORMAT=Xxxxxxxxxx XXXXXXXXXXXXXXXXXXXX Xx:Xx:Xx Xxxxx Xxx \
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

Would log the following to smtpd_in.txt on an incoming email from localhost:
5551212 127.0.0.1 S 08:20:13 00004 1 Test

```
[smtpd]
BILLING_FIELDS=nfrhislLt
BILLING_FORMAT=Xxxxxxxxx,XXXXXXXXXXXXXXXXXX,Xx:Xx:Xx,XXXXX,XXX,\
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

Would log the following to smtpd_in.txt on an incoming email from localhost:
5551212,127.0.0.1 ,S,08:20:13,00004,1 ,Test

```
[smtpd]
BILLING_FIELDS=nfrhislLt
BILLING_FORMAT=X,X,Xx:Xx:Xx,X,X,X
```

Would log the following to smtpd_in.txt on an incoming email from localhost:
5551212,127.0.0.1,S,08:20:13,4,1,Test

```
[smtpd]
BILLING_FIELDS=nfrhislLt
BILLING_FORMAT='X','X','Xx:Xx:Xx','X','X','X'
```

Would log the following to smtpd_in.txt on an incoming email from localhost:
'5551212','127.0.0.1','S','08:20:13','4','1','Test'

```
[vmail]
BILLING_FIELDS=nfrhisHISL
BILLING_FORMAT=XXXXXXXXX XXXXXXXXX X Xx:Xx:Xx Xx:Xx:Xx XXX
```

Would log the following to vmail_in.txt on an incoming message from \
subscriber 5551234:
5551212 5551234 G 08:20:13 08:21:48 23

Status codes:

```
httpd:
E = error
M = rejected - too many messages for this subscriber
S = successfully sent
```

```
vmail:
S = success
```

F = failed
L = login
G = guest
A = outgoing voice message accepted
I = invalid
E = database error
C = countdown exceeded
P = bad caller passcode

smtpd:

D = mailbox doesn't exist
E = database error
I = mailbox invalid
M = rejected - too many messages for this subscriber
U = rejected due to a filter
S = successfully accepted

snppd:

D = mailbox doesn't exist
E = database error
I = mailbox invalid
M = rejected - too many messages for this subscriber
U = rejected due to a filter
S = successfully accepted

tapd:

E = database error
I = mailbox invalid
S = successfully accepted
T = timeout
C = bad checksum
B = bad block
F = TAP send failure
A = TAP send accepted

tnppd:

T = timeout
A = TNPP out - packet ACKed
n = TNPP receive - packet NAKed
2 = TNPP receive - duplicate packet (only if LOG_DUPS enabled)
f = TNPP receive - packet filtered CAN sent
a = TNPP receive - packet ACKed
d = TNPP receive - mailbox ID does not exist
i = TNPP receive - mailbox invalid
e = database error
c = TNPP receive - no output route for this destination

r = TNPP receive - all output queues full
R = TNPP send - received RS
N = TNPP send - received NAK
C = TNPP send - received CAN
F = faulted input

vmpage:

A = message sent successfully
F = message send failed

Chapter 11

Troubleshooting

The Omega systems can be configured to keep very detailed logs for troubleshooting customer or connectivity issues. These logs are stored in the `/var/opt/omega_ums/debug` directory in a sub-directory using a format of YYYY-MM-DD named for the date the debug information was written. For example, April 14th, 2006's debug logs are stored in the directory `/var/opt/omega_ums/debug/2006-04-14`. Inside this sub-directory there are files for each thread of each program running. For example, the first tnpp port will be in a file called `tnppd000_ttyx.dbg`. The 000 is the first thread (threads use 0-based numbering), the ttyx is the name of the device. In the case of serial ports it will normally be tty something. For TCP ports it will be based on the name entered for DEVICE in the port settings.

11.1 Operating system

11.1.1 Bootup Issues

First determine if it is a computer issue or boot issue. Does the computer power on? Does the system appear to startup, but cannot find the operating system?

11.1.2 Network issues

By default the Omega is setup to obtain an IP address and domain settings automatically from a DHCP server. In order to use the Omega to accept connections from the Internet, a static IP should be used. This static IP address may be assigned by a DHCP server or in the Omega configuration files. See the “Network settings” section in the “Installation” chapter for information on setting the IP address and verifying that it is setup correctly. For more information you may use the following commands:

```
man netstat
```

```
man ping
man traceroute
man tcpdump
```

11.2 Application

11.2.1 Interpreting the debug logs

The debug logs contain a wealth of information for troubleshooting customer or port setup issues. All debug entries are prefixed with a timestamp. This timestamp has millisecond accuracy for determining with sub-second accuracy how much time has elapsed between each event in the log. When `DEBUG_FUNCS` is enabled each time a function is called a debug entry is added showing the name of the function and some possibly important parameters. These lines can be recognized because they start with `in` after the timestamp. Other important lines are the `ComRead`, `ComWrite`, `NetRead`, and `NetWrite` lines. These come in various forms like `ComWriteString` and `NetReadBlock`. The `Com` functions handle RS-232 port routines and the `Net` functions handle network connections. Other lines are also logged that show additional information.

11.2.2 Alarms

Application alarms are sent to the syspage server running on the Omega. Syspage accepts alarms from the TNPP programs and sends alerts based on the settings in the `[syspage]` and `[alarm]` sections of the ini file. Syspage will log a copy of the alarm in the `/var/opt/omega_ums/errors` directory in a file named after the program that generated the alarm. For example, `httpd.err` or `tnppd.err`. Syspage now supports also sending a copy of this alarm message to a serial port so you can send a copy to a separate alarm device if you wish. Alarm pages will also be sent based on settings in the `[alarm]` section of the ini file. These alarms can be paged out with the SMTP, SNMP, SNPP, or WCTP protocols.

Alarms are sent at various alarm levels. The following is a list of alarm levels:

	32	Informational	
	64	Notice	
els:	128	Error	Most systems
	196	TNPP port fault-off and recover messages	
	240	Critical	

are setup to email a copy of the alarms at error level 64 and above and set to page out alarms at error level 128 and above. It is recommended that error level 196 and above are paged out as these are alarms that indicate a degraded service level.

11.3 Syslog server

Unix and Linux systems include a centralized system logger called syslog. The Omega includes a system logging and paging program called syspage, so we don't log much to syslog. The syslog logs are stored in /var/log and may be in sub-directories under /var/log. Syslog messages can also be forwarded to another system acting as a centralized logging server. Our ISI and IPG boxes, make much more use of syslog as they do not have an alarm pager such as syspage in them.

11.4 SNMP

The TAP Digital Modem Server in Omega systems using the Dialogic (formerly Eicon Networks) Diva Server boards support SNMP queries. The following are some of the queries that can be performed:

```
snmpwalk -v 2c -c public -m ISDN-MIB localhost isdnMibObjects
```

returns:

```
ISDN-MIB::isdnBearerChannelType.1 = INTEGER: 0
```

```
...
```

```
ISDN-MIB::isdnBearerOperStatus.1 = INTEGER: idle(1)
```

```
...
```

```
ISDN-MIB::isdnBearerChannelNumber.1 = INTEGER: 1
```

```
...
```

```
ISDN-MIB::isdnBearerPeerAddress.1 = STRING: 8437671775
```

```
...
```

```
ISDN-MIB::isdnBearerPeerSubAddress.1 = STRING:
```

```
...
```

```
ISDN-MIB::isdnBearerCallOrigin.1 = INTEGER: unknown(1)
```

```
...
```

```
ISDN-MIB::isdnBearerInfoType.1 = INTEGER: unrestrictedDigital(3)
```

```
...
```

```
ISDN-MIB::isdnBearerCallSetupTime.1 = Timeticks: (28925900) 3 days, 8:20:59.00
```

```
...
```

```
ISDN-MIB::isdnBearerCallConnectTime.1 = Timeticks: (28925900) 3 days, 8:20:59.00
```

```
...
```

```
ISDN-MIB::isdnSignalingGetIndex.0 = INTEGER: 1
```

```
snmpwalk -v 2c -c public -m DIAL-CONTROL-MIB localhost dialControlMibObjects
```

returns:

```
DIAL-CONTROL-MIB::callHistoryTableMaxLength.0 = INTEGER: 512
DIAL-CONTROL-MIB::callHistoryRetainTimer.0 = INTEGER: 1 minutes
DIAL-CONTROL-MIB::callHistoryPeerAddress.19146899.1 = STRING: 8437671775
...
DIAL-CONTROL-MIB::callHistoryReceiveBytes.28924699.1 = Gauge32: 0
```

```
snmpwalk -v 2c -c public -m DS1-MIB localhost dsx1ConfigTable
```

returns:

```
DS1-MIB::dsx1LineIndex.1 = INTEGER: 101
DS1-MIB::dsx1IfIndex.1 = INTEGER: 101
DS1-MIB::dsx1TimeElapsed.1 = INTEGER: 100
DS1-MIB::dsx1ValidIntervals.1 = INTEGER: 323
DS1-MIB::dsx1LineType.1 = INTEGER: dsx1E1CRC(5)
DS1-MIB::dsx1LineCoding.1 = INTEGER: dsx1HDB3(3)
DS1-MIB::dsx1SendCode.1 = INTEGER: dsx1SendNoCode(1)
DS1-MIB::dsx1CircuitIdentifier.1 = STRING: N/A
DS1-MIB::dsx1LoopbackConfig.1 = INTEGER: dsx1NoLoop(1)
DS1-MIB::dsx1LineStatus.1 = INTEGER: 1
DS1-MIB::dsx1SignalMode.1 = INTEGER: none(1)
DS1-MIB::dsx1TransmitClockSource.1 = INTEGER: 0
DS1-MIB::dsx1Fdl.1 = INTEGER: 0
DS1-MIB::dsx1InvalidIntervals.1 = INTEGER: 0
DS1-MIB::dsx1LineLength.1 = INTEGER: 0 meters
DS1-MIB::dsx1LineStatusLastChange.1 = Timeticks: (29080000) 3 days, 8:46:40.00
DS1-MIB::dsx1LineStatusChangeTrapEnable.1 = INTEGER: 0
DS1-MIB::dsx1LoopbackStatus.1 = INTEGER: 0
DS1-MIB::dsx1Ds1ChannelNumber.1 = INTEGER: 0
DS1-MIB::dsx1Channelization.1 = INTEGER: 0
```


Chapter 12

Maintenance

To keep your system running at peak performance there may be certain maintenance procedures which should be routinely performed.

12.1 Backups

To backup the Linux configuration files, place a floppy in the floppy drive and type the following:

```
tar czvf /dev/fd0 --files-from /root/backup_files
```

The application directory may also be backed up using a writable CD. First make sure that the directory will fit on a CD by typing the following:

```
du -sk /opt/omega_&#x2D;ifthenelse{&#x2D;boolean{EnableVoice}}&#x2D;ums}&#x2D;img}
```

If this returns more than 650000 the billing logs may need to be archived. This can be done a few different ways. If you have an entire years worth of billing logs you may want to zip the entire year. For example, to zip up the entire year of 2005 type the following:

```
cd /opt/omega_&#x2D;ifthenelse{&#x2D;boolean{EnableVoice}}&#x2D;ums}&#x2D;img}/logs
zip -r 2005.zip 2005
```

You can verify the zip file with:

```
unzip -v 2005.zip
```

If no errors are reported you may delete the 2005 directory with the following:

```
rm -rf 2005
```

To zip a single month, cd into the year directory with the following:

```
cd /opt/omega_elseifthenelse{\boolean{EnableVoice}}{ums}{img}/logs/2006
zip -r jan.zip 01-??
```

Again verify the zip file as described above and remove the 01-?? directories with the following command:

```
rm -rf 01-??
```

Once the `du -sk` returns less than approx 650000 (or 700000 for 80 minute CDs), you can copy the entire `/opt/omega_ums` directory to CD with the following command:

```
mkisofs -R /opt/omega_elseifthenelse{\boolean{EnableVoice}}{ums}{img} | cdrecord -v fs=6
```

The 1,0,0 may be different on your system. Type the following to see what the three numbers are for the CD burner in your system:

```
cdrecord -scanbus dev=ATA
```

12.2 Daily maintenance

None at this time

12.3 Weekly maintenance

12.3.1 Software and Security Updates

There will not necessarily be software or security updates each week, but you may wish to check for them each week. See the “Operating System Updates” section for more information on the update procedure.

12.4 Monthly maintenance

12.4.1 Filters

Depending on the installation site, the filter in the front of the Omega may need to be vacuumed. Use the following procedure if you need to remove the filter to clean it:

- Open the front of the Omega chassis by turning the key knob to the horizontal position (you may need to use the key).

- Using a #2 phillips screwdriver remove the two screws on each side of the front cover which hold the cross-hatched plastic filter retainer in place.
- Remove the cross-hatched plastic filter retainer and filter.
- Clean the filter.
- Reinstall filter by reversing the steps used to remove it.

Chapter 13

Frequently Asked Questions

- Q: A subscriber has entered the incorrect passcode when trying to login to their web page and now the system says “Access disabled too many bad attempts”. How do I fix this?
- A: Modify their mailbox record using `dbmaint` or web admin and set their `BadWebAttempts` back to 0. Also make sure that `MaxWebAttempts` is set to a reasonable value like 3.
- Q: A user has entered the incorrect passcode when trying to login to web admin page and now the system says “Access disabled too many bad attempts”. How do I fix this?
- A: Modify their user record using `dbmaint` or web admin and set their `BadLoginAttempts` back to 0. Also make sure that `MaxLoginAttempts` is set to a reasonable value like 3.
- Q: I have receive an alarm that says “chthread 128 httpd restart exceeded max tries (3) in 60 seconds”. What does this mean?
- A: The `vmstart` program has detected that `httpd` has exited for some reason and tried to restart it. If it exceeds three restarts in 60 seconds `vmstart` will disable the `httpd` program requiring you to manually restart the `httpd` process after determining the cause of the problem. `httpd` is used here as an example, other program names may also show in this alarm.

Chapter 14

Change summary

14.1 Changes from 3.6 to 3.7

- new license key format - all existing licenses will need to be upgraded
- harkregister program to register demo application mode and automatically retrieve license information for licensed copies

14.2 Changes from 3.5 to 3.6

- config support log period
- if numeric message received via alpha protocol store message as numeric
- tnpp don't process "LOGON FAIL" for commone unless in state 4 (sending CAN to commone will reply with LOGON FAIL)
- vmbackup supports mounting Windows UNC path for backups (Win32 version only see vmbackup SERVER_PATH, SERVER_USER, SERVER_PASS, LOCAL_USER, LOCAL_PASS)
- support using TAP passwords to select a profile with different timeouts and counters
- add TAP profile support to specify different TAP timeouts and counters
- use http X-Forwarded-For for remote IP address now that we are primarily using Apache for reverse proxy
- tnpp udp connection enhancements
- tnpp support no serial number check to work around commone issue
- debug logs now compress strings of nulls to reduce debug file sizes

- mbpage now support repeat paging
- tnpp commone connections require link tests even if active traffic on link (non-standard)
- tnpp queue no longer send packet out port it came in on even if route created for it
- ISDN PRI fixes

14.3 Changes from 3.4 to 3.5

- email input no longer requires spaces after email headers
- Support Hark INM netmodem
- Enhance GCP programming ability for use by Manage More Billing

14.4 Changes from 3.3 to 3.4

- USA Mobility WME protocol support.
- SMTP server now uses MaxEmailSize for ESMTP size (was MaxMessageLen).
- SMPP server now supports sending callback TLV if SMPP \geq 3.4 and callback number is specified.
- SMPP server now support handset originated emails to destination ID_FORWARD.
- HTTP server now supports a graphical confirmation page (CAPTCHA).
- support customized email header prefixes on outgoing message.

14.5 Changes from 3.2 to 3.3

- Messages are now stored with a unique message ID for easier message tracking lookup later.
- Support specifying Data Coding for SMPP output.
- UMS updates.

14.6 Changes from 3.1 to 3.2

- Now use allow source to specify whether a mailbox is allowed to receive message from specific sources (e.g. SNPP, SMTP, etc).
- External LDAP subscriber lookup now supported.
- SMPP server now supports bi-directional connections. Messages can be received via SMPP now.
- HTTP server now supports a disclaimer page before sending a message.
- Support %r in SourceAddress for creating a random number.
- SMPP server supports receiving a message to REPLY_FORWARD looking up the return email address in mldata and emailing the reply to the original sender.

14.7 Changes from 3.0 to 3.1

- WCTP server now supports SubmitRequest in addition to ClientSubmitMessage.
- SMPP server additional support for SMPP v3.4.
- TNPP server now supports RTS ATNP protocol.
- WCTP server now supports caller passcode.
- SMTP server now supports a configurable HELO name for spamassassin score reduction.

14.8 Changes from 2.9.0 to 3.0

Along with many minor changes the following major changes have been made:

- Linux support is now released simultaneously with Windows version.
- Supports larger than 2 Gigabyte debug logs. Will also rename a 2GB debug file and create a new file for that port.
- Now supports splitting the vm directory into area codes, or area codes and exchanges to reduce the number of sub-directories in a single directory on large systems. The original method of storing all mailboxes sub-directories in the vm directory is still supported.
- Can now bind to specific outgoing TCP ports for connecting to systems that require it.

- Can now bind listen ports to specific IP addresses for better support of multiple network interface cards. Previously the Omega would bind to the listen port on all available network interfaces.
- Web admin interface rewritten to support a much better user interface.
- The web-based real-time stats viewing is improved using AJAX technology to refresh the stats without downloading the entire html page or having to click refresh. The refresh time is configurable and the auto-refresh can be enabled or disabled by clicking a button on the web page.
- The web interface now supports include files to eliminate copying and pasting large sections of html. For example, company specific headers and footers.
- The web interface now supports keep-alive connections.
- Syspage no longer sends duplicate alarms by checking if an alarm sent from a module is the same as the last alarm from that module.
- SNPP server now supports CALLerid and SUBJect.
- And some internal restructuring for enabling new technologies and methods. For example, better clustering support in Linux.
- Now supports devices.InputRate for throttling incoming RS-232 protocols (e.g. TAP and TNPP).
- Support setting SMPP source TON/NPI per device.
- Support setting SMPP dest TON/NPI per dialtype.
- New mailbox search function for web-based paging. Added department field to allow searches based on department also.
- Support for scheduling in future table. Also allows recurring paging.
- Virthost can now track the number of web-based messages sent to each virtual host.
- Linux version supports console (and ssh) based real-time stats viewer with rtview program.
- Created mdmtype table so modem init strings don't have to be entered into each device record for the modems.
- TCP servers (e.g. HTTP, SMTP, SNPP) now get their settings from the devices table. This allows the servers to listen on multiple ports and offer a virtual host type ability.
- ISDN PRI now supported in addition to channelized T1. **UMS only

Chapter 15

Warranty Information

WARRANTIES

For a period not to exceed one year from the date of purchase, Hark Technologies, guarantees that the electronic equipment sold will be fit for the ordinary purposes for which they are supplied, and will conform to the property description and statements of fact contained within any applicable brochure and labels provided with the product. However, upon the cessation of the one year warranty, Hark makes no warranty, expressed or implied, that the equipment is merchantable and/or fit for any particular purposes.

The Seller warrants that the goods covered by this agreement shall be free from defects in material and workmanship for one year when use under normal conditions and for the purpose for which they are sold. However, the warranty period for expendable parts, such as bulbs and fuses shall be limited to thirty days. If this product is licensed as a “Software Only” product, the warranty shall be limited to one year.

This warranty does not extend to damage incurred by natural causes such as lightning, fire, floods, or other catastrophes, damages caused by environmental extremes such as power surges and/or transients or willful, malicious, reckless, negligent acts or misuse by the purchaser or third parties.

All warranty work must be performed at Hark Technologies. No credit will be given for unauthorized repair work attempted by the customer or other unauthorized repair facilities. In/warranty merchandise must be shipped freight prepaid to the nearest Hark Technologies facility.

A Return Materials Authorization (RMA) Number must be obtained from Hark Technologies customer service department prior to returning any equipment, in-warranty, or otherwise to Hark Technologies for repair. Equipment received without the proper RMA number will be returned to the shipper.

All goods and materials are carefully tested and inspected before leaving the point of manufacture; however, as it is impossible to always detect imperfections, the only guarantee that is given by us, or for which we are in any way liable, is to repair or

replace such goods as prove defective, when used for the purposes for which manufactured. All replaced goods are to be returned to us transportation prepaid. Under no circumstances are we responsible for any other damages, incidental, consequential, or otherwise, nor in any case shall we be responsible for any damages beyond the price of the goods. No damages or charges of any kind, for labor, expenses, or otherwise suffered or incurred by the customer in replacing or repairing defective goods or otherwise occasioned by the customer will be allowed.

Written notice must be promptly given to the Seller of any perceived failure of the equipment sold, in order to fulfill the warranty, and in no event shall notice be given more than ten days after the discovery of the product defect. The notice shall state in what parts and wherein the warranty has failed and reasonable time shall be given to the Seller to remedy the difficulty. Failure to provide adequate notice within the required time frame shall be conclusive evidence of due fulfillment of the warranty on the part of the Seller, and that the product is satisfactory to the Purchaser, and that the Seller shall be released from all liability under the warranty.

DISCLAIMER OF WARRANTIES

THE WARRANTY PRINTED ABOVE IS THE ONLY WARRANTY APPLICABLE TO THIS PURCHASE. ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.

IT IS UNDERSTOOD AND AGREED THAT UNDER NO CIRCUMSTANCES SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, WHETHER THE THEORY OF LIABILITY IS BASED IN CONTRACT, TORT, UNDER ANY WARRANTY, OR IN NEGLIGENCE. THE PRICE AS STATED FOR THE WARRANTY IS A CONSIDERATION FOR LIMITING SELLERS WARRANTY. FURTHER, NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THE TRANSACTIONS UNDER THIS AGREEMENT MAY BE BROUGHT BY THE PURCHASER MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED.

BREACH OF AGREEMENT

In the event that the terms or conditions of this Agreement are breached, then Hark is entitled to have the customer pay all reasonable court costs, attorney fees and expenses that shall be made or incurred by Hark in enforcing this Agreement; and the parties agree that the terms and conditions of this Agreement shall be binding on, apply and inure to their respective heirs, executors, administrators, successors and assigns.

This invoice shall be construed and governed by the laws of the State of South Carolina AND VENUE IN ANY LITIGATION PURSUANT TO THIS INVOICE SHALL BE IN DORCHESTER COUNTY, SOUTH CAROLINA.

ALTERATIONS AND CHANGES

Any alterations for deviations from the above specifications that involve extra material, costs or additional or more costly labor will require extra charges. These extra charges will be billed over and above the proposal amount.

PROPOSAL GOOD FOR THIRTY (30) DAYS

The price given in the proposal for material and labor is an offer that shall bind Hark for 30 days. If the proposal is not accepted within 30 days, then Hark has the option of revoking its proposal.

AGREEMENT SUBJECT TO APPROVAL BY MANAGEMENT

This offer is subject to management's approval. If terms of payment are: cash on completion, or if this is a credit sale, this offer is also subject to approval by Hark's credit manager.

ACTS BEYOND HARK'S CONTROL

Hark is not responsible for delays in delivery or for delays in installation due to weather, fire, strikes, governmental regulations, or other causes unforeseen or beyond it's control.

SECURITY AGREEMENT

Hark may require as a condition to this Agreement that the customer execute a security agreement to safeguard its position as a creditor in extending payment terms to the customer. In the event that Hark requires collateral, the customer agrees to provide a promissory note and a security agreement (and UCC-1) in the manner acceptable to Hark.

BAD CHECKS & C.O.D.

A service charge of \$25.00 will be applied to each returned check. Accounts 60 days old will be placed on C.O.D. and technical service shall be withheld. Legal action will be taken after the account is 90 days old.

RETURNS

No returned goods will be accepted without a Returned Merchandise Authorization Number.

HANDLING/RESTOCKING CHARGE

A restocking charge of 20% will be made on all goods returned unless due to error caused by Supplier.

EQUIPMENT PACKING

Packing instructions: Equipment to be returned to Hark Technologies for repair must be packed in the original packing supplied by the factory. If the original packing is not available, Hark Technologies will provide it to you for a nominal fee. Customer packing materials can be used, providing the precautions are taken to provide adequate static protection for the equipment.

DO NOT PACK HARK EQUIPMENT IN STYROFOAM PEANUTS ONLY

Repairs necessitated due to improper packing will be billed at the standard factory repair rate.

Hark Technologies will repair or replace equipment and return to customer, freight prepaid, within the continental United States. Equipment found not to be defective will be returned at purchaser's expense and will include cost of handling, testing and returning of equipment.

Out-of-warranty repairs will be billed at the established factory flat rate per hour, plus components needed for replacement.

TITLE

Title to and all goods or material hereafter purchased shall remain with Supplier until full purchase price has been paid.

ENTIRE AGREEMENT

This Agreement constitutes the entire agreement between the parties hereto; and this Agreement shall not be modified, amended, altered, or changed except by a written agreement signed by the party sought to be charged. However, change orders may be made by an oral agreement as enumerated in the "Alterations and Changes" section above.

Chapter 16

Cancellation

Buyer may by written notice to Seller within five (5) days of the merchandise received date cancel any contract or agreement arising here under, for other than the default of the Seller and at its convenience, in which the Buyer shall pay the Seller twenty percent (20%) of the above total price for all products and accessories as a restocking charge.

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