Nortel Networks Media Processing Server Series COMMGR Reference Manual

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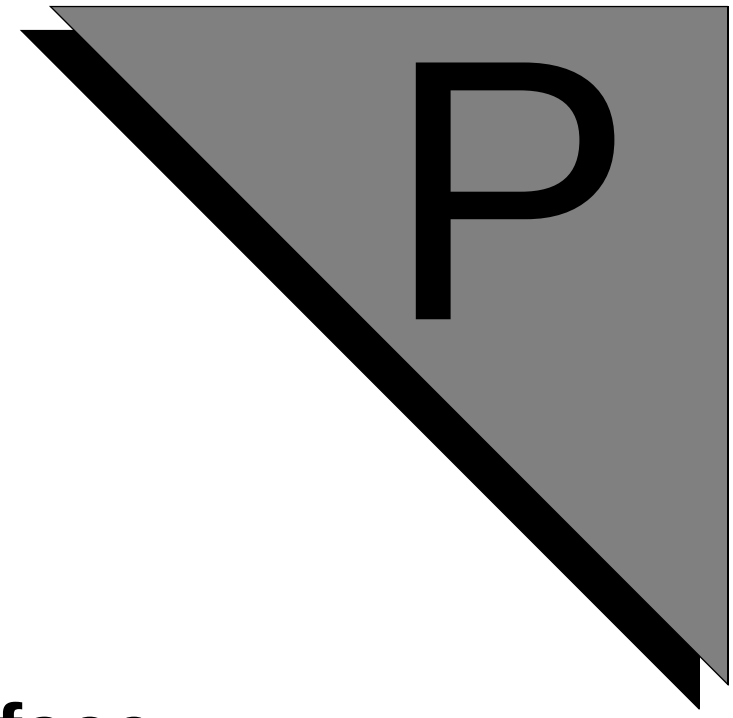


Preface

This chapter covers:

1. **Scope of this manual**
2. **Intended audience**
3. **Use and organization of this manual**
4. **Documentation and trademark Conventions**
5. **Manual (Man) pages**

Preface

Scope

The *Nortel Networks Media Processing Server Series COMMGR Reference Manual* details how to configure a Nortel Networks Media Processing Server Series (MPS) system to communicate with various types of host computer systems. This manual provides background information and details about configuration parameters common to most host environments, as well as information about optional MPS features that can be used at specific sites.

This manual covers topics that are specific to the configuration and operations of MPS systems. It is not intended to explain general telephony concepts or the characteristics of specific types of host computers.

Although some application programming depends on the type of host environment in use, this manual does not cover application programming techniques. See the *PeriProducer Reference Manual* for details on application programming.

Intended Audience

This manual is intended for the staff members who configure and program the MPS for use with specific host computers.

The reader should be familiar with telecommunications and computer equipment, their functions and associated terminology. In addition, the reader must be familiar with the characteristics of the specific installation, including on-site power systems, computers, peripherals, and telephony components.

This manual assumes that the user has completed an on-site system familiarization training program conducted as part of the initial system installation. Basic knowledge of the Solaris and/or Windows NT operating system(s) is also assumed.

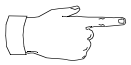
How to Use This Manual

This manual uses many standard terms relating to computer system and software application functions. However, it contains some terminology that can only be explained in the context of the MPS system. Refer to the *Glossary of MPS Terminology* for definitions of these terms.

Initially, this manual should be read at least once from start to finish. Later, the ***Table of Contents*** and ***Index*** can be used to locate topics of interest for reference and review.

If this document is being viewed online, use the hypertext links to quickly locate related topics. Click once with the mouse while the cursor is positioned over the hypertext link. Click on any point in a ***Table of Contents*** entry to move to that topic. Click on the page number of any ***Index*** entry to access that topic page. Use the hyperlinks at the top and bottom of each online "page" as needed when navigating the documentation. Pass the cursor over the Nortel Globemark to display the title, software release, publication and revision number, and release date for the manual.

For additional related information, use the Reference Material link in PeriDoc. To become familiar with various specialized textual references within the manual, see ***Conventions Used in This Manual*** on page ix.



Periphonics is now part of Nortel Networks. The name *Periphonics*, and variations thereof, only appear in this manual where it is refers specifically to certain product names and commands. (As examples, a *PeriProducer* application, the *PERImps* package, the **`perirev`** command, etc.)

Organization of This Manual

The following briefly outlines the structure of this manual:

Chapter *1. Introduction*

Provides an overview of host communications configuration and software architecture.

Chapter *2. Configuration Files*

Describes the configuration of the files relevant to host communications. Sample configuration files are provided.

Chapter *3. Configuration and Status Commands*

Describes the aspects of communications configuration common to most installations. The topics include: command syntax, VSH command execution, loading the communications software, specifying the desired protocol, determining host link availability, setting common parameters, and selecting a particular host session.

Chapter *4. Virtual Terminal (VT) Configuration*

Describes the configuration and use of Virtual Terminals (VTs). Topics include general configuration issues, assigning VTs to phone lines, VT Pooling, VT status information, and application programming notes.

Appendix *A. Host Character Sets*

Describes the character set conversion tables for use with specific types of host computers and applications. This is supported only for the LU6.2 and VPSTN3270 protocols.

Conventions Used in This Manual

This manual uses different fonts and symbols to differentiate between document elements and types of information. These conventions are summarized in the following table.

Conventions Used in This Manual

Notation	Description
Normal text	Normal text font is used for most of the document.
important term	The Italics font is used to introduce new terms, to highlight meaningful words or phrases, or to distinguish specific terms from nearby text.
`system command`	This font indicates a system command and/or its arguments. Such keywords are to be entered exactly as shown (i.e., users are not to fill in their own values).
`file name / directory`	This font is used for highlighting the names of disk directories, files, and extensions for file names. It is also used to show displays on text-based screens (e.g., to show the contents of a file.)
on-screen field	This font is used for field labels, on-screen menu buttons, and action buttons.
<KEY NAME>	A term that appears within angled brackets denotes a terminal keyboard key, a telephone keypad button, or a system mouse button.
Book Reference	This font indicates the names of other publications referenced within the document.
cross reference	A cross reference or man page reference is shown on the screen in blue. Click on the cross reference to access the referenced location. A cross reference that refers to a section name accesses the first page of that section. Click on the man page reference to elicit a pop-up window displaying the subject man page.
	The Note icon identifies notes, important facts, and other keys to understanding.
	The Caution icon identifies procedures or events that require special attention. The icon indicates a warning that serious problems can arise if the stated instructions are improperly followed.
	The flying Window icon identifies procedures or events that apply to the Windows NT operating system only. (1)
	The Solaris icon identifies procedures or events that apply to the Solaris operating system only. (2)

(1): Windows NT and the flying Window logo are either trademarks or registered trademarks of the Microsoft Corporation.
(2): Solaris is a trademark or registered trademark of Sun Microsystems, Inc. in the United States and other countries.

Solaris and Windows NT Conventions

This manual depicts examples (command line syntax, configuration files, and screen shots) in Solaris format. In certain instances, Windows NT specific commands, procedures, or screen shots are shown where required. The following table lists examples of general operating system conventions to keep in mind when using this manual with either the Solaris or NT operating system.

	Solaris	Windows NT
Environment	`$VPSHOME`	`%VPSHOME%`
Paths	`$VPSHOME/common/etc`	`%VPSHOME%\common\etc`
Command	**`<command> &`**	**`start /b <command>`**

Trademark Conventions

The following trademark information is presented here and applies throughout this publication for discussions of third-party products. Trademark information is not repeated hereafter.

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IEX® and TotalNet® are registered trademarks of the Tekelec Company.

Manual (Man) Pages

Manual (man) pages provide access to documentation about Solaris system commands, MPS commands, status/exception conditions, and alarm information. Man pages can be displayed from any command line on Solaris systems. On NT systems, man pages can be displayed from a DOS prompt/VSH prompt. Man pages appear in a separate browser window. The particular browser used depends on the software installed on the system and which browser is set as the default. In addition, man pages are always accessible through PeriDoc's Search page and through hypertext links within the documents.

To access a Man Page for:

- a Solaris system command, use the syntax **`man <command>`** (*Solaris only*).
- an MPS command, use the syntax **`mpsman <processname> <command>`**.

  On Solaris systems only, enter **`man mpsman`** for a detailed description of using MPS command manual pages.
- an MPS alarm, use the syntax **`mpsalarm <processname> <alarm#>`**.

  On Solaris systems only, enter **`man mpsalarm`** for a detailed description of using alarm manual pages, or **`man alarmintro`** for an overview of MPS alarms and the alarm database.
- an MPS status/exception condition, use the syntax **`conman <condition>`**.

  On Solaris systems only, enter **`man conman`** for a detailed description of using MPS condition manual pages.

The man page scripts rely on the Windows NT registry settings for default browser information. Older browsers do not set the registry entries required by the man page scripts. Do not use command line man pages if you are using browsers older than Netscape Navigator 4/Internet Explorer 4.

If you are viewing this document online, click any command highlighted in blue to open a window displaying the manual page for that command.

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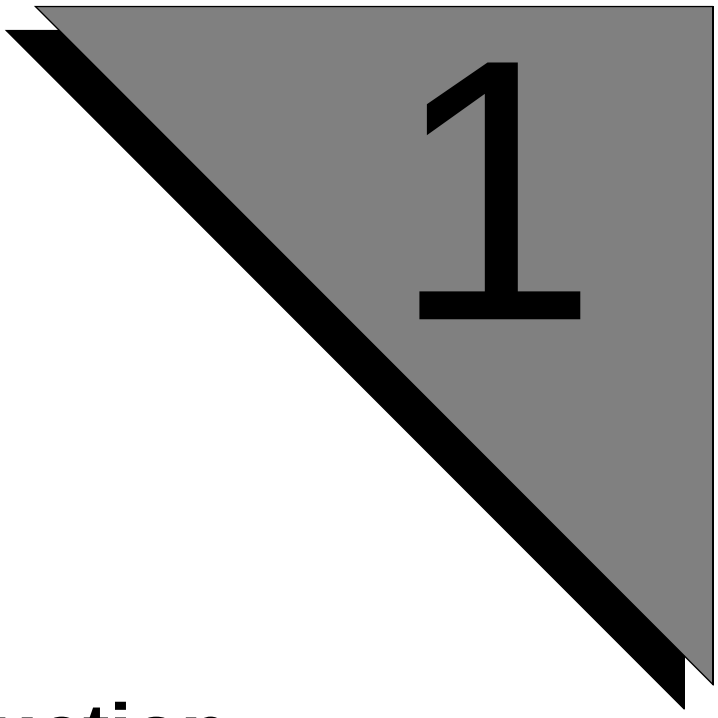


Introduction

This chapter covers:

1. **Communications configuration overview**
2. **Software architecture**

1. Introduction

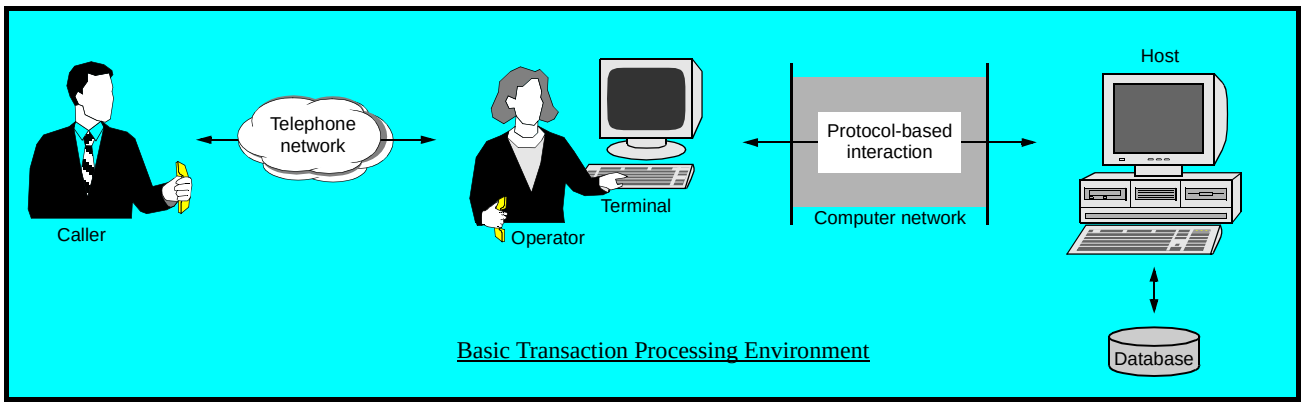
The Nortel Networks Media Processing Server Series (MPS) is an IVR (Interactive Voice Response) system with augmentations for multimedia functions and advanced telephone switching. An MPS can function as a stand-alone services system, with its own transaction processing and storage facilities, or be integrated into service-provider environments with their own central computer systems.

Overview of Host Computer Communications

In a telephony services environment, the MPS is the link between network features and the calling community. External systems in the network connected to the MPS are referred to as *host computers*. Generally, hosts are of the mini, mainframe, or workstation classification. They provide database and transaction processing functions, which are integrated with the voice and media features of the MPS. The MPS can facilitate any data, voice, or telephony service that the network's host computers are designed to provide.

Before the advent of IVR systems, computer-based transactions involved having a live operator enter and receive data through a terminal connected to a central computer system. When the MPS is integrated into this kind of basic transaction processing environment, it emulates the actions of the operator as it interacts with the caller, host(s), and internal system resources.

The actions of the MPS are governed by *applications*. These are scripts containing programmed instructions, such as for receiving caller input, providing voice output, accessing the host, etc. MPS applications are created using PeriProducer, which is a GUI-type editor that allows visual sequencing of application instructions. (See the *PeriProducer User's Guide*.)



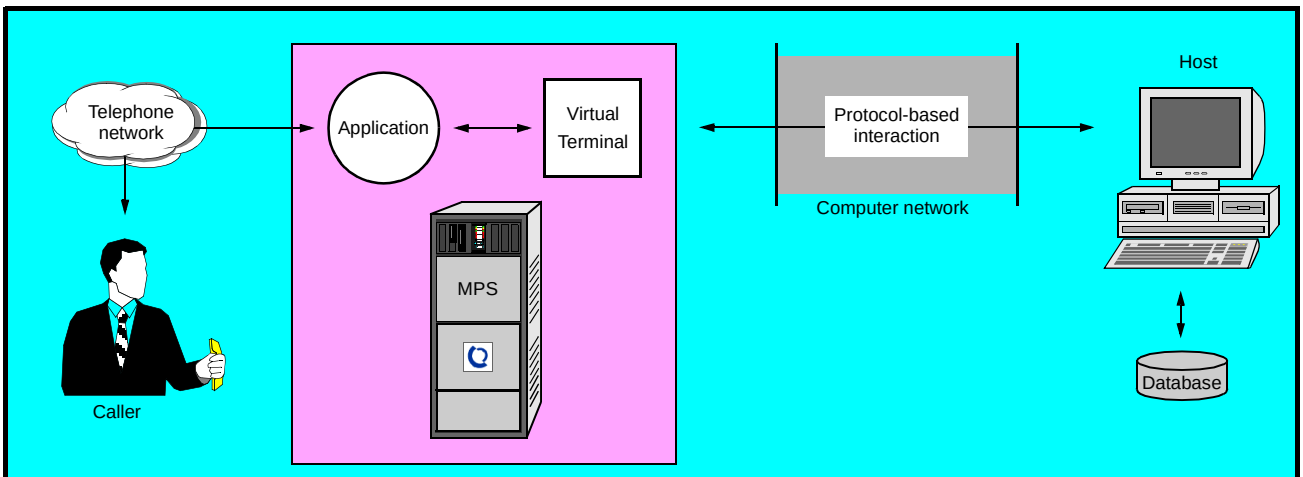
Basic Transaction Processing Environment

An application is activated by associating it with one of the MPS telephone lines. The set of lines in the system can run multiple copies of the same application, different applications, or any combination. When an application's phone number is dialed, the application activates and interacts with the caller based on it's programmed instructions.

If an application requires access to a host, the MPS assigns a set of internal hardware and software resources, referred to as a *Virtual Terminal (VT)*, to the application's phone line. This VT is seen by the host as an operator's terminal. When issuing configuration commands to a VT, the VT is identified to the system by a unique *service ID*.

Read and write operations are performed between the VT and the host in the same manner as is done with a standard terminal, based on the characteristics of a particular host communications *protocol*. A protocol is a standardized format for transmitting data between computer systems. The format consists of command codes, data values, delimiters, etc. that both computers can recognize. To send data to and receive data from a host, the MPS must be configured for the appropriate protocol.

An application can communicate with up to eight hosts, each of which can use a different protocol. Applications can easily change the host *session* as needed, which means to switch from one host to the next. The particular protocol expected by each host is set up in the MPS configuration files.



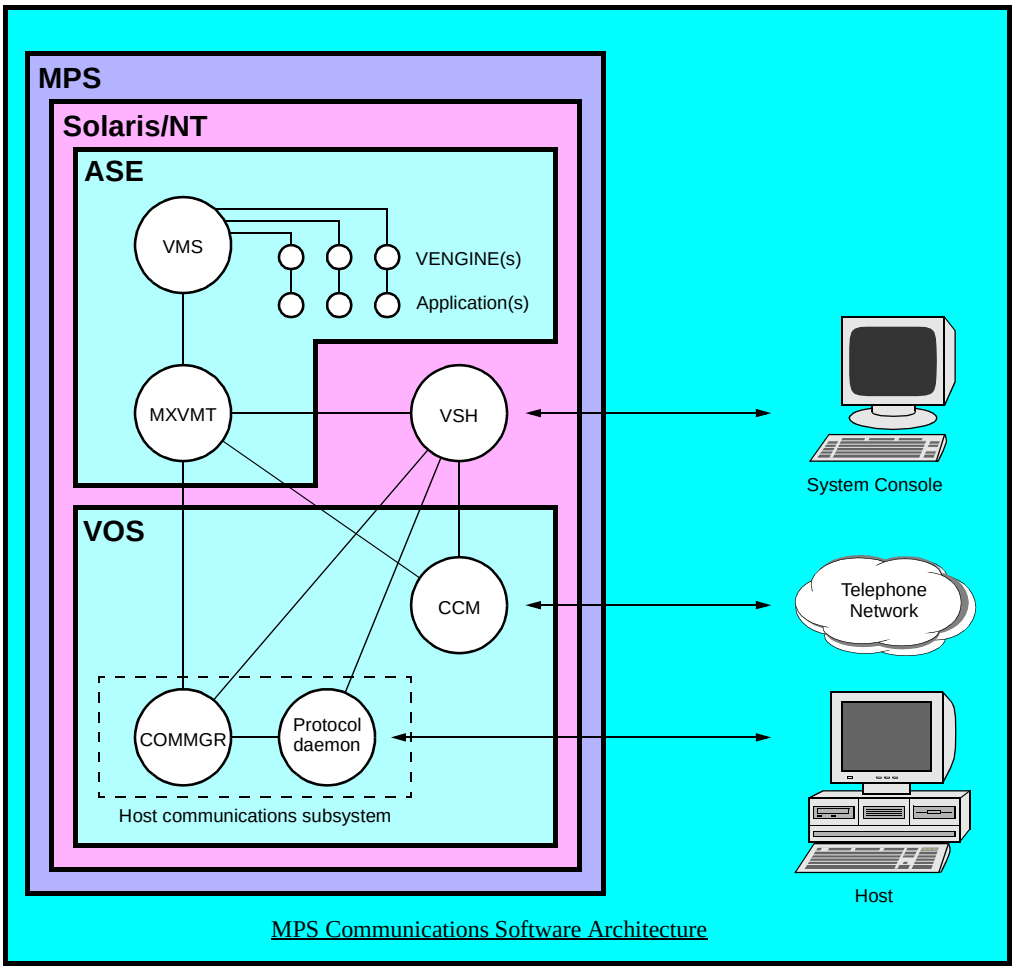
Basic MPS Transaction Processing Network

MPS Software Architecture

The MPS *host communications subsystem* contains a set of processes specifically dedicated to host interaction. The host subsystem resides in the *VOS (Voice Operating Software)* of the MPS, and is comprised of two layers: the *COMMGR (Communications Manager)* process and the *protocol layer.*

The COMMGR process provides a generic (i.e., protocol-independent) application interface for host communications services. It mediates the interaction between MPS applications and the protocol-layer process(es). The COMMGR is also responsible for the majority of data processing related to external communications, including configuration, application-to-host session mapping, and host input/output processing. A single COMMGR process runs on each MPS in the network.

The exact software arrangement of the protocol layer depends on the protocol type. In this layer, there is one main process (generally a protocol server or manager process) that handles the communications needs of all MPS applications using that protocol. Depending on the design of a particular protocol, there might be multiple ancillary interface processes in the protocol layer.



MPS Communications Software Architecture

The system processes relevant to host communications are described below.

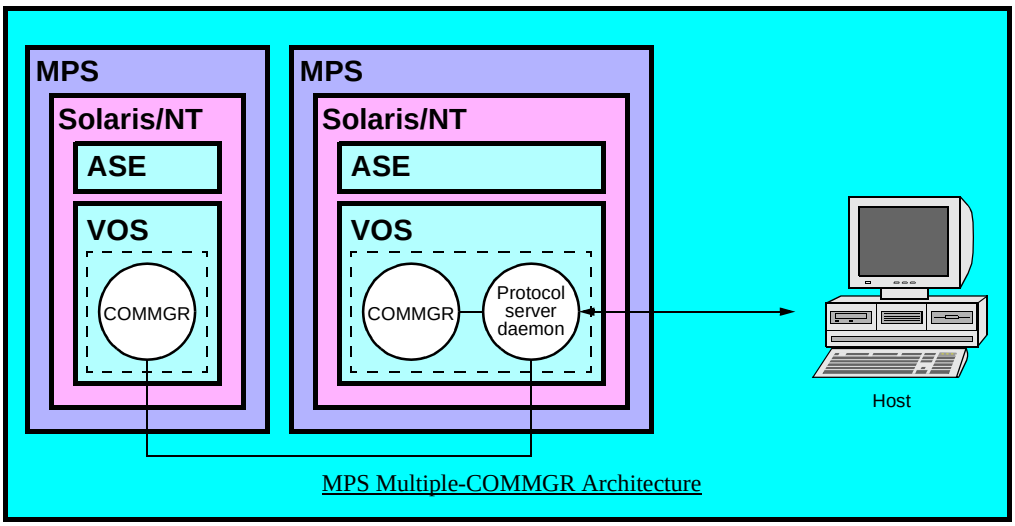
MPS System Software

VSH	*V-shell* is the command interface for MPS configuration and operations. Configuration and status commands can be issued via the VSH tool or from the system's configuration files. VSH receives status information from the various system processes and displays messages on the console as appropriate.	
ASE	The *Application Service Environment* software is dedicated to providing the data and services requested by applications. The ASE exists on a separate workstation, referred to as the *applications processor.* The workstation can be either an open-systems Solaris or Windows NT implementation.	
	applications	Interactive Voice Response or multimedia script created with PeriProducer. An application runs on a system phone line. Multiple instances of the same application can be assigned to different lines. Each application is associated with it's own VT.
	VENGINE	Software process that executes an application. A single VENGINE process is required for each application telephone line.
	VMS	The *VENGINE Message Server* provides a message funnel between the ASE and VOS processes. On a node that contains multiple MPS systems, VMS provides connectivity between the application processor and each MPS. One VMS is required for each MPS.
	MXVMT	The *Media Transaction VENGINE Message Translator* relays messages between the ASE and VOS processes. One MXVMT process is required for each MPS.
VOS	The *Voice Operating Software* is the set of processes that provide the low-level system functions in the MPS. These functions include telephony and host I/O, and are common to most types of applications.	
	COMMGR	The *Communications Manager* provides a generic application interface for host communications services. A single COMMGR is required for each MPS in the network.
	protocol daemon	Software process that implements the particular communications protocol. The protocol layer links the COMMGR with the host computer. With some protocols (e.g., CCA, ATTE, etc.), the protocol daemon invokes driver programs to manage individual VT sessions.
	CCM	The *Call Control Manager* configures and controls low-level telephony interaction.

Protocol Architecture

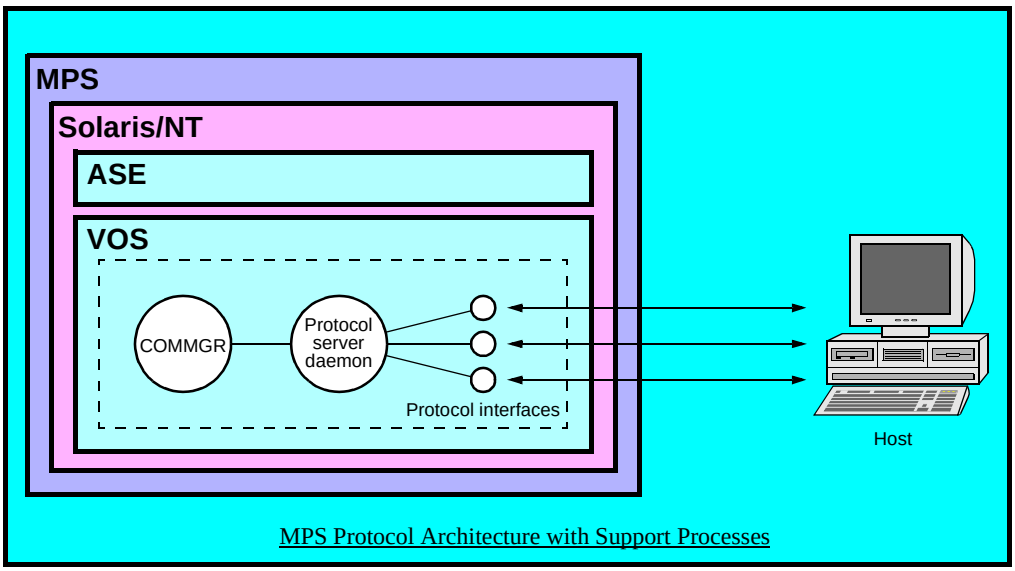
All protocols require use of the COMMGR and a server or manager process specific to each protocol. This process is called the *protocol daemon*. Each protocol also has unique internal architecture and might require special hardware interfaces for the host.

For some protocols, such as certain variations of Credit Card Authorization, the protocol layer is implemented as a server, which can be shared by the COMMGR client processes on multiple MPS systems.



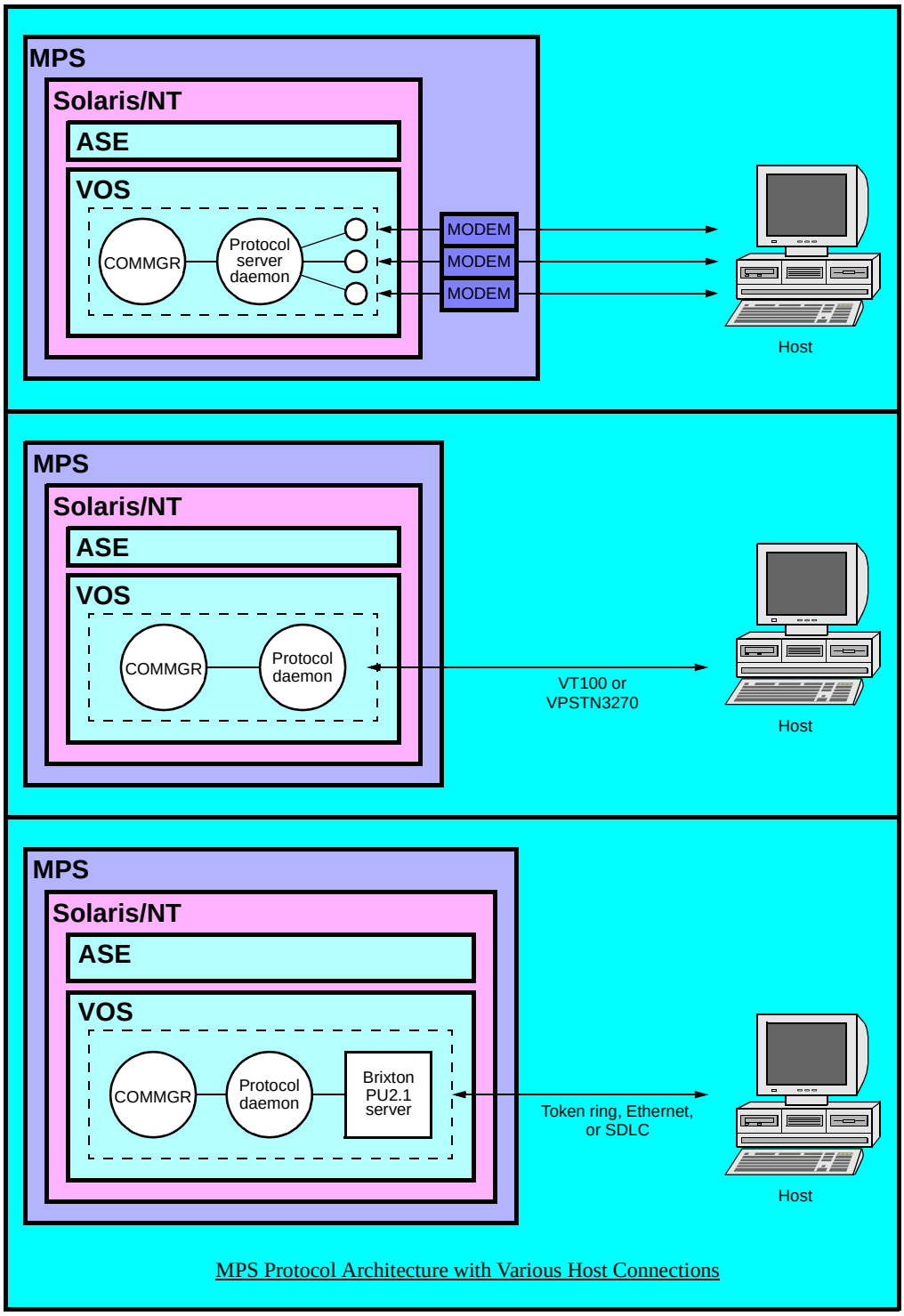
MPS Multiple-COMMGR Architecture

For protocols like GeoTel or IEX, the protocol layer consists of a single server process without any interface processes. For some other protocols, the server software spawns multiple interface processes, one for each application VT.



MPS Protocol Architecture with Support Processes

Depending on the protocol, the MPS interacts with the host either by modem or via LAN/WAN-type connections (TCP/IP, Ethernet, SDLC, Token Ring, X.25 or Async). Some environments incorporate the Brixton PU2.1 server with VPSTN3270 functionality to additionally mediate host communications.



MPS Protocol Architecture with Various Host Connections

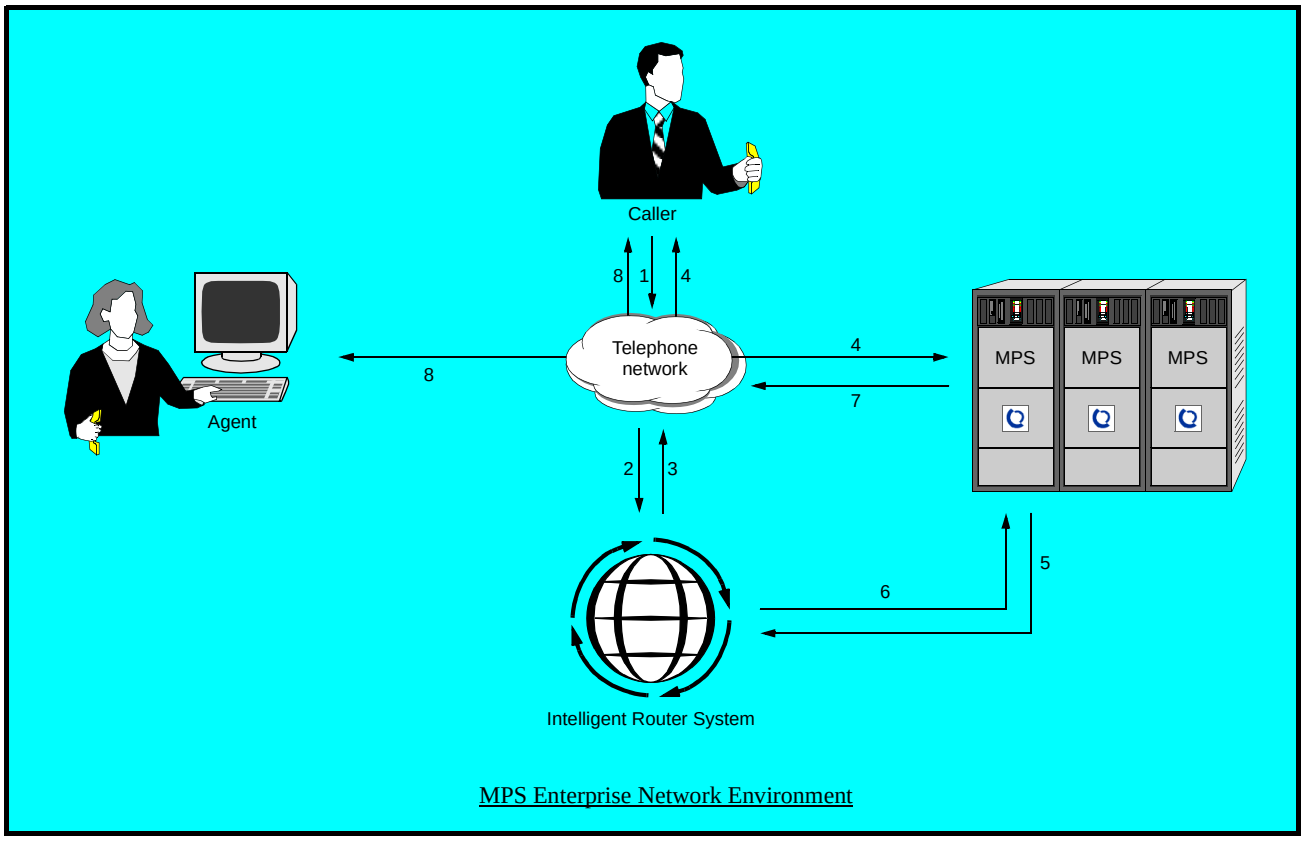
Telephone Switching Environments

In large-scale, enterprise-type networks, the MPS can be integrated with an intelligent router system that performs call load balancing and network reporting.

This type of installation requires use of either the GeoTel or Nortel Networks' IEX systems. Although GeoTel and IEX use the host communications facilities of the MPS, they are not considered host protocols in the traditional sense. Rather, they are enterprise-type communications protocols that allow interaction between an MPS and telephony-network-based services.

A typical call routing scenario is described below:

1. A caller dials phone number for a particular network service.
2. The telephone network requests switching instructions from the intelligent router.
3. The intelligent router sends switching instructions to telephone network.
4. The call is routed to an available MPS system.
5. If the application can complete the call, the MPS sends updated call status and line availability information to the intelligent router. If the caller requires additional assistance, the MPS sends a call routing request to the intelligent router.
6. The ICM transmits the new call destination to the MPS.
7. The MPS transmits call switching instructions to the network.
8. The call is connected with a customer service agent.



MPS Enterprise Network Environment

Supported Protocols

For the MPS to communicate with a host, the appropriate protocol software must be configured on the MPS. The specific architecture, configuration, operation, and features of each host protocol is documented in it's own manual.

The following protocols are currently supported by the MPS:

Protocols Supported by the MPS

Host Protocol	Connection Type	MPS Protocol Name
TELNET	TCP/IP	ATTE (VT100 terminal emulation)
Async 24-Byte Header PACE rawtty	serial	ATTE
TELNET 3270	TCP/IP	VPSTN3270 (RFC1576, RFC1646) PPI
3270 LU type 2	Ethernet (802.2) Token Ring (802.5) SDLC X.25	VPSTN3270 - Solaris (requires Brixton PU2.1 Server) VPSTN3270 - Windows NT (requires Microsoft Host Integration Server 2000)
LU type 6.2	Ethernet (802.2) Token Ring (802.5) SDLC X.25	LU6.2 - Solaris (requires Brixton PU2.1 Server) LU6.2 - Windows NT (requires Microsoft Host Integration Server 2000)
Credit Card Authorization visa - credit visanet - batch, credit, debit mapp - batch, credit edc - batch, credit etc - credit	MODEM	CCA_SERV, CCA_MGR
	TCP/IP (with POS port device)	POS_SERVER
	TCP/IP	PaylinX - Vital VirtualNet (requires PERIjsb, and PaylinX Java API)
GeoTel ICM	TCP/IP	GeoTel
IEX	TCP/IP	IEX

Each of these protocols allows up to 255 concurrent host sessions on each MPS, but the actual limit depends on available system resources, CPU, memory and swap space, and application requirements.

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2

Configuration Files

This chapter covers:

1. **The commgr.cfg File**
2. **The vpshosts File**
3. **The vos.cfg File**
4. **The host#.rc File**

2. Configuration Files

For products that are part of the Nortel Networks Media Processing Server Series (MPS), certain configuration files have to be installed and modified to support host communications. These files are supplied in generic form when the system is shipped from the factory. For most sites, these files require only minor modifications to configure all necessary functions of a given protocol.

For Solaris systems, the configuration files are stored in the directory `$VPSHOME/vpsN/etc/`, where "N" indicates the ID number of the particular MPS unit.

For Windows NT systems, the configuration files are stored in the directory `%VPSHOME%\vpsN\etc\`, where "N" indicates the ID number of the particular MPS unit.

The following configuration files are used in every MPS installation that supports host communications:

MPS Communications Configuration Files

`commgr.cfg`	Contains commands that set parameters specific to the COMMGR process. (See ***The commgr.cfg File*** on page 13.)
`vos.cfg`	Defines process names and their associated TCP/IP port numbers. This system uses the protocol's entry in this file to assign an appropriate port number. (See ***The vos.cfg File*** on page 14.)
`<protocol>.cfg`	Contains commands for the particular protocol daemon. (See ***The <protocol>.cfg File*** on page 15.)
`host#.rc`	Internal configuration file for a particular host configured in the `commgr.cfg` file. (See ***The host#.rc File*** on page 16.)
`vpshosts`	Specifies the network components associated with a particular node. (See ***The vpshosts File*** on page 17.)

The *Nortel Networks Media Processing Server Series System Reference Manual* contains additional information about these files not documented here.

The `commgr.cfg` File

The main host communications configuration file is called `commgr.cfg`. The parameters specified in this file are parsed and interpreted by the COMMGR software automatically upon system startup.

The configuration requirements of the `commgr.cfg` file depend on the particular protocol. Sample `commgr.cfg` files are provided in each protocol features manual.

In the `commgr.cfg` file, commands are preceded by the "**`host #`**" syntax construction. The "**`#`**" indicates the particular host to which the configuration parameters will apply. (See ***Command Syntax and Usage*** on page 20.)

Up to eight logical hosts can be defined. In the `commgr.cfg` file, there is one set of **`host #`** commands for each defined host (i.e., a set of commands, as needed for **`host 1`**, **`host 2`**, **`host 3`**, etc. that configure each of these hosts). An application issues **`session`** commands, as needed, to change the host with which it is communicating. (See ***Host Session Assignment*** on page 25.)

The commands that can be used in this file are documented in Chapter ***3. Configuration and Status Commands***. These commands set parameters that configure the host communications software. Most parameters have default values suitable for most installations. If a parameter's default is adequate, the corresponding command need not be included in the `commgr.cfg` file. (The `commgr.cfg` file usually contains just a few commands for each defined host.)

A sample `commgr.cfg` configuration file for a dual-host, 96-line T1 system is shown below.

Sample `commgr.cfg` File

```
host 1 protocol <protocol1_name>
host 1 svcid 1-48 sess 1
host 1 svcid 1-48 assignvt 1
host 2 protocol <protocol2_name>
host 2 svcid 49-96 sess 2
host 2 svcid 49-96 assignvt 49
```

The vos.cfg File

The vos.cfg file defines process names and their associated TCP/IP port numbers. Each MPS system has its own vos.cfg file.

For nodes that have more than one MPS system, the port numbers are assigned uniquely in each vos.cfg file for each process. (Port numbers are assigned automatically when the system software is installed.) In addition, port numbers must not conflict with Solaris system port numbers. (See the description of the /etc/services file in the Solaris documentation.) SRP (*Startup and Recovery Process*) always uses port number 5999, so no other process can be assigned this port number.

A dash ("-") in the PORT column indicates that SRP assigns a unique port to the process during system startup.

To configure a particular protocol, uncomment the line that references the protocol name.

Sample vos.cfg File

```
#
# Example vos.cfg file.
#
# NAME      HOST  PORT    PRI  COMMAND LINE

trip        -     -       0    trip
tcad        -     -       0    tcad
vmm         -     -       0    vmm
ccm         -     -       0    "ccm -c tms -m clean -s 1-180"
vstat       -     -       0    vstat
commgr      -     -       0    commgr
#
# Uncomment the appropriate host protocol entries
#
#atte       -     -       0    atte
#vpstn3270  -     -       0    vpstn3270
#appc_cm    -     -       0    appc_cm
#cca_mgr    -     -       0    cca_mgr
#cca_serv   -     <port>  0    cca_serv
#plx_mgr    -     -       0    plx_mgr
#geotel     -     -       0    geotel
#pos_serv   -     <port>  0    pos_serv
```

The `<protocol>.cfg` File

Each MPS node has a configuration file specific to the selected protocol, which contains commands that configure the protocol daemon. The configuration files and commands for each protocol are documented in their own manuals. Refer to the manual that covers the particular protocol.

In the case of a server-type protocol, where multiple client MPS systems share a single protocol server daemon (see ***Protocol Architecture*** on page 6), the `<protocol>.cfg` exists only on the system that is actually running the process.

Each MPS system has a unique identification number that distinguishes it from other systems in the network. The `<protocol>.cfg` file for a given MPS is stored in the directory `$VPSHOME/vpsN/etc`, where `N` indicates the identification number of the particular system.

The following is important information about issuing protocol daemon commands:

- If there are multiple MPS systems on a single node, the port numbers specified in each `$VPSHOME/vpsN/etc/<protocol>.cfg` file must be unique.
- In almost all cases, protocol configuration commands should be specified only in the `<protocol>.cfg` file (as opposed to entering them from the command line). This ensures that after the command sequence is programmed, it will execute properly and consistently whenever the system is restarted.
- Configuration commands can only be issued when the host link is in a down state. Since the configuration files are read during system startup, the PG link is always down at that time.
- Configuration commands can be issued from VSH, but this is generally done only for the purpose of diagnostics and debugging. Only status commands should be entered into the VSH tool on production systems.
- Certain commands can include a Virtual Terminal (VT) range to identify particular lines for which the parameter values are to be set. If the VT range is omitted, the default VT range is assumed. (See ***Virtual Terminal Range Commands*** on page 21.)

The `host#.rc` File

Each defined host has it's own configuration file. The name of this file is of the format `host#.rc`, where "#" is a number from **`1`** to **`8`** indicating a particular host definition.

Upon system startup, the **`host #`** parameters are read from the `commgr.cfg` file and are distributed to the appropriate `host#.rc` file. That is, the set of **`host 1`** commands are placed in the file `host1.rc`, the set of **`host 2`** commands are placed in the file `host2.rc`, and so on.

The set of `host#.rc` files are stored in the `/opt/vps/vpsN/etc` directory, where `N` corresponds to the identification number of the particular MPS. Each MPS unit associated with the node has its own set of `host#.rc` files.

The `host#.rc` files serve the purpose of storing those parameters specified in the `commgr.cfg` file that cannot be sent to the protocol layer until the software is activated. The parameters are downloaded from the `host#.rc` files to the protocol layer when the process is ready.

If a host link goes down during normal system operations, all communications software is automatically reloaded, and the configuration settings are read again from the appropriate `host#.rc` file when the link returns.

DO NOT modify the `host#.rc` files. These files are automatically erased and recreated by the system during startup based on the commands in the `commgr.cfg` file.

The `vpshosts` File

The `vpshosts` file identifies the MPS systems and other components associated with a particular node. Typically, the file's contents is the same across all nodes, unless a particular node has unique components.

Each component listed in this file is identified by a component number, a component type, and the name of the node where it resides. A node name specified as a dash ("-") implies the local node. Each component on the local node has a corresponding subdirectory under `$VPSHOME` on Solaris systems, and under `%VPSHOME%` on NT systems.

For example, if four MPS systems are defined in the `vpshosts` file, the following subdirectories exist: `$VPSHOME/vps1` (`%VPSHOME%\vps1`), `vps2`, `vps3`, and `vps4`. Each MPS listed in the `vpshosts` file has it's own set of configuration files (e.g., `vos.cfg`, `commgr.cfg`, etc.) in the appropriate `vpsN/etc` directory.

The `vpshosts` file is automatically created or updated on a node when the system is installed. A node only connects with those components defined in its `vpshosts` file. The file might have to be manually edited for the MPS to connect with components installed on other nodes.

The following is an example of the `vpshosts` file:

Sample `vpshosts` File

```
$1
#
#vpshosts
#
#     This file was automatically generated by vhman.
#     Wed Apr  26 19:16:25 2000
#
# COMP     NODE      TYPE
110         -         vps
1           -         tmscomm
56        tms3003     vps
```

It is not necessary for every MPS node to have information about other nodes. However, a PeriView workstation has to be configured with information for all nodes that it will control. For specific information about the `vpshosts` file for use with PeriView, see the *Nortel Networks Media Processing Server Series PeriView Reference Manual*.

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3

Configuration and Status Commands

This chapter covers:

1. **Command syntax**
2. **Protocol configuration**
3. **Host availability and status displays**
4. **Common configuration parameters**

3. Configuration and Status Commands

Command Syntax and Usage

The COMMGR process exists in all versions of the Nortel Networks Media Processing Server Series (MPS). An MPS uses *configuration commands* to set up the host communications software subsystem. These commands are intended to be issued to the COMMGR process or protocol daemon from the `commgr.cfg` file during system startup, while the host link is still down.

COMMGR *status commands* display information about the configuration and/or current state of the software. Status commands can be issued from the VSH tool at any time after system startup, with or without an active host link.

Configuration and status commands are identified to the command processor by the keyword **`host`**. This is always followed by a number from 1 to 8 that specifies a particular logical host. Each defined host has it its own set of configuration commands. Commands that apply to one host do not affect the others.

The following is important information about issuing configuration and status commands:

- In terms of syntax, most COMMGR configuration commands can also be issued from the VSH command line. However, because some of the critical commands are sequence dependent, and cannot be issued when the host is up, it is not recommended that VSH be used for host configuration.
- In the `commgr.cfg` file, there must be a space between the keyword **`host`** and the logical host number. On the command line, there must be no spaces between **`host`** and the associated number.
- Multiple commands for a specific host can be included on the same line. If a command string contains any errors, parsing of the string terminates at the point of error, and any commands to the right of the error are not processed. Generally, multiple-command strings should only be used for options applicable to all phone lines.
- Protocol configuration also requires that certain protocol-specific commands be issued from the daemon's configuration file. (See ***The <protocol>.cfg File*** on page 15.) These commands are documented in separate users guide manuals.

Global Commands

Global configuration commands configure COMMGR functions that are applied to all VTs. They use the following syntax:

host # <cmd1 [cmd2 [...]]> (entered in `commgr.cfg`)
host# <cmd1 [cmd2 [...]]> (entered from the VSH command tool)

Specifies a command/parameter for a defined host, where **#** is the host's logical number. Valid values are in the range 1-8. Using this syntax, the specified command is applied to all applications in the system.

Virtual Terminal Range Commands

When a VT is associated with an application, the COMMGR assigns to it a unique *service identifier.* Commands that configure the host software at the VT level can be entered with a **svcid** range to apply the parameter values only to the specified applications. Multiple commands can be specified on a single line if they have the same **host** and **svcid** arguments.

To issue a command for a range of applications, use the following syntax:

host # svcid #[-#] <cmd1 [cmd2 [...]]> (`commgr.cfg`)
host # svcid all <cmd1 [cmd2 [...]]>

host# svcid #[-#] <cmd1 [cmd2 [...]]> (VSH tool)
host# svcid all <cmd1 [cmd2 [...]]>

Specifies a command/parameter for a single host, where # is the host's logical number. The syntax **svcid #[-#]** specifies a particular range of applications to which the settings are applied. These applications must have service IDs that are consecutively numbered. To apply the settings to all applications, use the syntax **svcid all**.

When a command is issued that includes a **svcid** specification, internally, that VT range is registered as the *default VT range*. If a **svcid** specification is omitted in a command that normally accepts one, the new parameters are applied to the default VT range. That is, the range for the new command is taken from the last command issued that included a **svcid** specification.

Protocol Daemon Commands

Commands issued from the `commgr.cfg` file that configure the protocol daemon (instead of the COMMGR) are called *host parameter* commands. For these commands, all syntax parsing is performed by the protocol daemon. They require the following syntax:

`host # param[eter] "<cmd1 [cmd2 [...]]>"` (`commgr.cfg`)
`host#  param[eter] "<cmd1 [cmd2 [...]]>"` (VSH tool)

Sends a text string containing one or more configuration commands to the protocol daemon, where **#** is the logical number of the host (1-8). Quotation marks are required if the string contains any spaces for separating commands and/or arguments. The keyword **`parameter`** can be abbreviated as **`param`**.

Protocol Configuration

There are two major protocol categories. For *manager* protocols, all necessary software is contained within a single MPS system. This includes the main protocol daemon (referred to as the *protocol manager*), the COMMGR process, and any support processes associated with individual VTs.

For *client/server* protocols, each MPS has its own COMMGR client that connects with a single *protocol server* daemon running on one specific system. This allows the entire network to use a single bank of phone lines on one machine to provide better access to the system VTs. Also, depending on the implementation, better reliability can be had through load sharing. The number of expected COMMGR client connections is specified in the `vos.cfg` file of the server node. (See ***The vos.cfg File*** on page 14.)

See ***Protocol Architecture*** on page 6 for illustrations of manager vs. client/server systems.

Manager-Type Protocol Configuration

A host is defined by a protocol name and whether or not it is asynchronous. The following command specifies a manager-type protocol configuration for a particular logical host:

host # protocol {atte [async] | vpstn3270 | cca_mgr | appc_cm | geotel | iex}

Defines the host protocol type, by specifying the name of the protocol's main software process:

- **atte**: async, telnet, or VT100 emulation
- **vpstn3270**: 3270 emulation
- **appc_cm**: LU6.2 emulation
- **cca_mgr**: Credit Card Authorization (manager only)
- **geotel**: GeoTel ICM
- **iex**: IEX TotalNet

This command must be included in the `commgr.cfg` file, as there is no default value.

This command and the **hostname**/**port** commands are mutually exclusive. (See ***Client/Server-Type Protocol Configuration*** on page 24.)

The **async** keyword is valid only for the ATTE-tty protocol. (ATTE-tty and ATTE-telnet are distinctly different protocols.) The **async** parameter specifies that the particular host requires asynchronous tty-type communications. By default, a host is configured to be synchronous.

Examples:

host 1 protocol geotel

Specifies that the first host interfaces with a GeoTel ICM system (and is non-asynchronous).

host 1 protocol atte async

Specifies that the first host is asynchronous and interfaces with an ATTE-tty host.

In non-asynchronous host interaction, data transmissions are synchronized with start/stop bits, and the keyboard is locked when data is sent to the host. The default mode for non-async hosts is **screen**. (See ***Screen Mode*** on page 34.)

In asynchronous data transmissions, the sending and receiving of data is synchronized by the use of control characters in the data stream. The keyboard is not locked, and multiple send operations can be performed (instead of a send always being followed by receive). The default mode is **pace**. (See ***24-Byte Header and Pace Mode Parameters*** on page 28.)

Client/Server-Type Protocol Configuration

In a client/server configuration, the protocol daemon acts as a server supporting multiple COMMGR connections. There is one COMMGR per MPS client, and each system has its own set of configuration files (i.e., `commgr.cfg`, `vos.cfg`, etc.).

To configure client/server systems, the protocol is not identified by name, but by the location on the server system where it resides.

The following commands must exist in the `commgr.cfg` file of each client system to configure the particular protocol. These commands should only be issued for protocols implemented as client/server processes (i.e., these commands and the **`protocol`** command are mutually exclusive).

`host # hostname <host> port <#>`

For server-type protocols, these two commands specify the location of the protocol daemon server to which the local COMMGR connects. The specified host must be one that is defined in the `vpshosts` file. (See ***The vpshosts File*** on page 17.)

The specified port number must be the one used by the server system for the daemon process, as specified in its `vos.cfg` file. (See ***The vos.cfg File*** on page 14.)

For a server protocol, these commands must be included in the `commgr.cfg` file, as there are no defaults.

`host # parameter "maxvt <#>"`

Specifies the number of VTs to be supported by the COMMGR running on the local client system. The server software cannot process any transactions from a given COMMGR client until this parameter has been set.

Example:

```
host 1 hostname eagle port 4013
host 1 parameter "maxvt 20"
```

Specifies that the local COMMGR is to connect with the server process running on the host named *eagle*, using port number `4013`. The client system supports up to 20 VTs.

Host Session Assignment

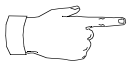
An application can communicate with up to eight hosts, each of which can use a different protocol. The protocol layer contains one or more logical definitions for each physical host. A logical host definition consists of a host number, a protocol identifier, and one or more protocol-specific processes. The same host can have multiple logical definitions.

To switch communications from one host to another, an application issues a **`session`** command from an ENVIRONMENT block, specifying the session number of the particular host.

Each defined host is associated with a session number by the **`host # svcid #[-#] session`** command. By default, a session number corresponds to a host's logical designation (e.g., host 1 is session 1, host 2 is session 2, etc.). This command can be used to override the default session associations for a set of specified VTs or for all VTs.

`host # svcid #[-#] session <#>`

Assigns a particular session number to the specified **`host #`**, for the applications with the service IDs **`#[-#]`**. Valid values for the session number are `1` to `8`.



In a multiple host environment, if one connection has **`headermode`** enabled and another does not, it is necessary to issue the **`headermode`** command each time the session is switched. (See ***Interacting with Multiple Hosts*** on page 30.)

Virtual Terminal Mapping

The set of Virtual Terminals are assigned to application phone lines by the **assignvt** command.

host # svcid #[-#] assignvt <#> Assigns the specified VT number (**<#>**) to the phone line(s). If a service ID range is given, the first line in the range is assigned the VT denoted by **<#>**, and the subsequent lines are assigned the next set of VTs.
Example: **host 1 svcid 1-2 assignvt 3** Specifies that VT 3 is mapped to line 1 and VT 4 to line 2.

The following is important information about VT assignments:

- The number of assigned VTs cannot exceed the setting of the **maxvt** parameter. For manager-type protocols, **maxvt** is set in the main protocol configuration file. For client/server protocols, **maxvt** can be specified in the `commgr.cfg` file or from an application. If issued from the file, the **maxvt** parameter must precede the **assignvt** and **session** commands. If **maxvt** is given from an application, the VT up condition has to be received before any other VT-related commands are issued.
- These options do not apply to the GEOTEL process, which requires each phone line to be assigned to the Virtual Terminal (VT) with the same numeric designation (i.e., line 1 maps to VT 1, line 2 maps to VT2, etc.).

Host Mode Configuration

The MPS can exchange messages with host systems in various formats. Typically, in synchronous communications, the MPS sends and receives messages identical to those that are sent to CRT terminals.

Alternatively, the MPS and host can exchange messages in 24-Byte Header or PACE data stream format. This type of message exchange generally reduces the amount of data exchanged. A disadvantage is that message interface software might have to be specially implemented on the host.

The message exchange format for a specific host is defined by using the **host mode** command:

host # mode {24 | pace | rawtty | screen}

Defines the host-MPS message format, where:

- **24** specifies 24-Byte Header mode. (See ***24-Byte Header and Pace Mode Parameters*** on page 28.)
- **pace** specifies PACE mode. (See ***24-Byte Header and Pace Mode Parameters*** on page 28.)
- **rawtty** specifies rawtty mode. (See ***Rawtty mode*** on page 34.)
- **screen** specifies screen mode. (See ***Screen Mode*** on page 34.)

The default host mode depends on whether or not the host is defined as asynchronous. (See ***Host Mode Configuration*** on page 27.) For non-async host configurations, the default mode is **screen**. If the host is specified as async, the default mode is **pace**. The **screen** option is valid only for non-asynchronous hosts and **rawtty** is valid only for async hosts.

24-Byte Header and Pace Mode Parameters

PACE (Periphonics Asynchronous Communications Exchange) is a format for data stream message exchange that is flexible and extensible. It can be used with both the 3270 mode of operation and the async mode. For a async type host, PACE is the default mode.

The term *asynchronous*, as used here, applies to the asynchronous nature of message exchanges between systems, rather than link-level character synchronization.

For backward compatibility with earlier generations of equipment, the MPS has a message exchange format called *24-Byte Header*. In this format, a header 24 bytes in length precedes the actual message data. The header consists of a message ID, phone line number, status and control fields, etc.

Internally, the system converts the 24-Byte Header into a PACE structure. The application program then processes the PACE commands. An application program can be provided that implements the MPS portion of this message exchange.

The MPS COMMGR does not automatically send *connect*, *disconnect*, and *ring* messages to a host in 24-Byte Header mode. Applications have to handle the conditions for these phone line states and then issue the *device-status* call function to send the data to the host.

Transaction Codes and Status-Only Messages

Some commands valid for both the PACE and 24-Byte Header modes involve the generation of *transaction codes* and status messages. Transaction codes are typically used with teleprocessing monitor programs, such as IBM CICS. These codes precede the input data and initiate specific transaction processing routines.

The following commands are for 24-Byte Header mode. Most of these commands support a **`svcid #[-#]`** specification, which causes the settings to be applied to a range of application VTs.

`host # [svcid #[-#]] ctran {<trancode> | -}`

Specifies a transaction code prepended by the system to all data messages sent from the indicated applications to the host, where:

- **`<trancode>`** is a string of up to 18 characters denoting the transaction code.
- **`"-"`** is a special character that disables this function. This is the default.
- **`#`** is the host number (1-8).
- **`#[-#]`** is the phone line range.

`host # [svcid #[-#]] stran {<trancode> | -}`

Specifies a transaction code prepended by the system to all status-only messages generated and sent by the system to the host (without any application involvement), where:

- **`<trancode>`** is a string of up to 18 characters denoting the transaction code.
- **`-`** is a special character that disables this function. This is the default.
- **`#`** is the host number (1-8).
- **`#[-#]`** is the phone line range.

The **`stran`** and **`ctran`** parameters can be set by an application via an Environment block to configure it's own phone line. This overrides any settings made in the `commgr.cfg` file. If an application sets one or both of these values, the settings made to that line in the `commgr.cfg` file are not restored when the application exits.

Header Message Translation

In a 24-Byte Header mode or PACE environment, the translation of header messages can be enabled or disabled. If *headermode* is enabled, the COMMGR translates the header messages. If headermode is disabled, the application performs the translation.

The **headermode** parameter is applied to the phone line and not its associated Virtual Terminal. Also, it is relevant only to hosts that support screen-type interaction, and cannot be used with async hosts.

The **headermode** setting is typically issued from application Environment blocks. Headermode is disabled only for the initial login screen and immediately re-enabled after login is completed.

host # svcid #[-#] headermode {on | off}

Configures the translation of header message for 24-Byte Header or PACE hosts, where:

- **#[-#]** are the service IDs for a range of applications.
- **on** enables message translation. This is the default.
- **off** disables translation.

Interacting with Multiple Hosts

For systems configured to interact with multiple hosts, if one host connection has **headermode** enabled (for either PACE or 24-Byte Header) and another does not, it is necessary to issue the **headermode** command each time the **session** command is used to switch between them. (The **headermode** parameter applies to the phone line and not its associated Virtual Terminal.)

In the following example, host 1 is a screen host (i.e., no header is required) and host 2 uses 24-Byte Header mode:

```
Environment session 1          {sets the session to host 1}
Environment headermode off     {disables header translations}
:
Environment session 2          {sets the session to host 2}
Environment headermode on      {enables header translations}
```

Applications can switch between hosts as needed. (See ***Host Session Assignment*** on page 25.)

Host Login Headers

If a host connection uses **`headermode`**, in most cases, it must be disabled during the login process.

Environment **`headermode off`**	*{disables header translations}*
login code	
:	
Environment **`headermode on`**	*{enables header translations}*
Send/Receive requests	*{send transaction data to host}*

24-Byte Header-Specific Parameters

Host Numeric Vocabulary Element Format

When running in 24-Byte Header mode, the MPS receives instructions from the host (instead of the application) to determine which vocabulary elements are spoken to the caller. The host references these elements by their numeric designations (i.e., the vocabulary element numbers). The following command specifies the format that the host uses to transmit element numbers. This command should be placed in the `commgr.cfg` configuration file.

`host # {wvocab | bvocab}`

Selects the format of vocabulary item numbers returned from a 24-Byte Header host, where:

- **`#`** is the host number (1-8).
- **`wvocab`** specifies that numbers are sent as words (i.e., two bytes).
- **`bvocab`** specifies that the numbers are sent as single bytes. This is the default.

If the vocabulary has more than 255 elements, **`wvocab`** must be set.

Call Referral Parameters

A host running in 24-Byte Header mode can send referral requests to the application. The **refer** command sets the mode for the application's phone line after the referral has been established. This command should only be issued from the `commgr.cfg` configuration file.

host # svcid #[-#] refer {input | output | hangup}

Sets a particular mode for the telephone line after referral bridging, where:

- **#[-#]** are the service IDs for a range of applications.
- **input** specifies that the line will wait for touchtone input after the referral is established.
- **output** specifies that a voice prompt is to be sent to the referral line after the referral is established.
- **hangup** specifies that the line is to be hung up after the referral is established.

A host running in 24-Byte Header mode can send a referral request to the application. The **rfno** command is used to specify the referral number to be to outdialed. This command should only be issued from the `commgr.cfg` configuration file.

host # svcid #[-#] rfno {<#> | -}

Sets the referral phone number in 24-Byte Header mode, where:

- **#[-#]** are the service IDs for a range of applications.
- **<#>** is the referral number. This can be up to 12 characters in length.
- "**-**"denotes a null telephone number. It is assumed that the host will supply the number.

Host Control of Voice Prompts

For backward compatibility, the **appcode**/**noappcode** command pair offers 24-Byte Header functionality. With earlier equipment, voice prompts could be controlled by the host computer. The host would send *appcodes* to the application that identified the voice prompts to be spoken. Interpretation of the appcodes is the responsibility of the application, which must be programmed to use the **PARAM** utility. These commands should only be issued from the `commgr.cfg` configuration file.

host # svcid #[-#] {appcode | noappcode}

Denotes the presence or absence of PARAM appcodes in 24-Byte Header messages from the host, where:

- **#[-#]** are the service IDs for a range of applications.
- **appcode** indicates the presence of appcodes in host messages.
- **noappcode** indicates that appcodes are not used.

Status Message Timestamp

A timestamp can be placed into status messages sent to the host in 24-Byte Header mode. This is configured with the **h9status** command. This command should only be issued from the `commgr.cfg` configuration file.

host # svcid #[-#] h9status {on | off}

Sets the status message timestamp sent in 24-Byte Header messages, where:

- **#[-#]** are the service IDs for a range of applications.
- **on** sets the timestamp to '`9999`'.
- **off** sets the timestamp to '`0000`', which is the default.

This command is functionally equivalent to the **host 9status** command in previous versions of VOS.

Rawtty mode

In the async mode of operation, application-specific protocols can be used by invoking the *rawtty* mode. In this mode, all host input is delivered to one phone line. The application associated with that line implements the message-level protocol and distributes the messages to the appropriate applications.

When running in **`rawtty`** mode, all host messages are sent only to the line associated with the first Virtual Terminal. VT 1 can be assigned to any valid phone line.

One way to implement communication between the applications is to use shared memory data cards. By assigning values to specific cards, any application that shares these cards can access the data.

Output to the host can come from any application. No formatting is done by the COMMGR software for messages in either direction (other than handling the standard sol/eol envelope). System-level inquiry response logic is not provided in this mode. The applications must perform this function explicitly if it is required.

Screen Mode

MPS applications communicate with most **`screen`** mode hosts using screens formatted to BMS (*Basic Map Support*) standards. To send data to the host, an application supplies a formatted screen with data for the relevant fields. To acquire input from the host, the application receives a formatted screen and reads the data from its fields.

The PeriMap utility provides all functions necessary for defining the screens. In most instances, when the MPS is installed, screens from existing data processing operations can adapted for use by applications. (See the *PeriProducer User's Guide* for more information about creating and using maps.)

Screen mode cannot be used with asynchronous hosts. (See ***Manager-Type Protocol Configuration*** on page 23.)

Host Response Timers

The system provides several ways for an application to track the status of the host and the timing of responses. For each phone line, the system maintains two timers that measure the timing of a response to a query. These timers specify a maximum time interval for the host response.

The *enquiry response* (**er**) timer is started when the application requests host input. If the host fails to respond in the specified time interval, an ***ertimeout*** condition is generated to the application, and the application handles it according to its programming.

The *intermediate* (**intime**) timer works differently. It specifies a time interval, which when elapsed, causes the system to speak out a special recorded message to the caller. This is used to notify the caller that requested information is unavailable, because the host has not yet responded to the query. This message spoken to the caller is triggered by the operating system, as opposed to having applications generate it.

To activate this feature:

- Specify the time interval using the **intime** timer as described below.
- Specify the name of the vocabulary element to be spoken using either APPMAN configuration parameters (see the *PeriView Reference Manual*) or by issuing the Environment **"intermsg"** option from within the application.
- Record an appropriate message into the vocabulary element referenced by the text string (e.g., *"We are experiencing a temporary processing delay. Please hold on or call back later."*) The default message says to the caller, *"Please hold on."*

host # svcid #[-#] er <#>

Specifies a value for the enquiry response timer, where:

- **#[-#]** are the service IDs for a range of applications.
- **<#>** is value for the parameter specified in seconds. (Specify **0** to disable this timer.)

host # svcid #[-#] intime <#>

Specifies a value for the intermediate timer. (Specify **0** to disable this timer.)

If the enquiry/response timer is to be used, the **intime** timer must be set to a value lower than **er** in order to be effective.

Keyboard Status

In some circumstances, remote host applications can send premature keyboard unlock instructions causing applications to perform RECEIVE TEXT/MAP operations inappropriately. The **unlocks** command instructs the COMMGR to ignore a specified number of unlocks following a SEND TEXT/MAP command before actually unlocking the keyboard.

The **unlocks** command is specified for a range of phone lines.

host # svcid #[-#] unlocks <#> Specifies the number of unlocks the COMMGR receives before unlocking the keyboard. The number supplied as an argument must be between **1** and **100**. The default is **1**.
Example: **host 1 svcid 3-5 unlocks 5** Instructs the COMMGR to wait for the fifth unlock after a SEND TEXT/MAP operation before unlocking the keyboard.

The **unlocks** command sets an internal configuration parameter for the VTs in the specified range. Each time a SEND TEXT/MAP is sent by COMMGR, the counter is set to the specified **unlocks** value. For each subsequent unlock, the counter is decremented, until it reaches 0, which unlocks the keyboard.

When this command is issued, the **unlocks** counter is reset to 0. If this is done during a system operation, it can affect the counting of unlocks for any outstanding SEND TEXT/MAP requests.

The status information displayed via the command **host # svcid # status** (see ***Host/VT Status Information*** on page 55) indicates the value of the unlocks option and the number of unlocks for which the COMMGR is currently waiting on the specified line(s).

The option is not enabled for AID keys. That is, the first unlock after an AID key will always unlock the keyboard.

Other COMMGR functions/failures that normally unlock the keyboard are as follows. When any of these functions are used, the unlock counter is reset to 0:

- A message failure for a SEND TEXT/MAP.
- An AID key that unlocks the keyboard. (See ***AID Keys*** on page 37.)
- Changes in host/Virtual Terminal status.

AID Keys

Attention Identifier keys (i.e., AID keys) are used for sending special terminal-type keystrokes to the host, such as *Program Function* and *Program Attention* keys. The set of valid host AID keys varies with the particular protocol. In some cases, these keystrokes are equivalent to commands that send screen maps or text streams. AID keys are usually issued by applications.

Generally, AID keys are issued from the command line only for testing communications functions. To issue an AID key, use the following command:

`host# [svcid #[-#]] aid <keyname>`

Sends an AID key to the specified host. The specified **`<keyname>`** must be valid for the selected protocol. Parentheses and quotation marks normally used to delimit the keyname when sent from an application must not be included when issued from the command line. This command can optionally be applied to a range of VTs. If entered at the command line, there must be no spaces between the keyword **`host`** and the host number.

Refer to the protocol features manuals for information about the specific set of AID keys supported by each protocol.

Unless there is no other backward-compatibility alternative, the command AID **`lock`** should never be issued from applications or from the command line. Unpredictable and detrimental effects can occur if AID **`lock`** is issued.

Whenever a message, screen map, or SEND request is sent to a host from an application, the default AID key is automatically sent with the data (unless another AID key is specified by the application for that SEND operation). The default AID key employed by the MPS depends on the specific host protocol. The following command changes the default AID key.

`host # aiddefault <keyname>`

Changes the default AID key on a per-host basis, where **`<keyname>`** is an ASCII string denoting the AID key.

The following AID keys must always be followed by issuing an AID **`IMMED`** keystroke, regardless of the protocol being used: **`ACCEPT`**, **`ALLOCATE`**, **`CONNECT`**, **`DEALLOCATE`**, **`DISCONNECT`**, and **`PF1-24`**.

Host Availability

The link to a host computer and associated communications equipment can experience failure for a variety of reasons. The MPS can detect the state of the host link in several ways depending on the protocol.

From the point of view of the COMMGR (and applications), a host is either available or unavailable. If the host is available (i.e., the host link is in an *up* state) it can exchange messages with MPS applications. When the host is unavailable (i.e., the host link is in a *down* state), applications cannot communicate with it.

The system informs applications about host availability via status conditions. The following command specifies whether or not applications receive these messages:

`host # svcid #[-#] hostctl {on | off}`

Enables or disables the passing of conditions to the applications, where:

- **`#[-#]`** is the service ID specification for an application or range of applications.
- The parameter **`on`** specifies that conditions are generated to the applications. If a problem renders the line without an available host, the application receives the ***`hctloff`*** condition. When the host link comes back up, the ***`htclon`*** condition is generated to the application, which will handle it according to its programming.
- The parameter **`off`** disables the passing of conditions to the applications. This is the default.

The following is important information regarding the status of host links:

- If an application is not configured for host interaction, the associated host link is considered down.
- The COMMGR software cannot detect a loss of host services if the MPS maintains data exchanges with the host, but the links to the application are no longer available. Applications must be written to handle this possibility. (For example, when using ATTE-telnet, a host down message indicates that the ATTE process is not running and host up indicates that ATTE is running. The COMMGR cannot determine if the telnet link is actually up or down.)

Host Status Commands

Host availability can be determined at any time by issuing the following command from the VSH tool:

host# status

Displays on-screen status information about the specified host.

Example:

```
vsh#mps.1 {1} -> host1 status

Host 1
------
Type        : VOS Generic
Mode        : screen
Protocol    : atte
Status      : Host down
Aid         : enter
```

This sample status display for the node `mps.1` indicates that host 1 is an ATTE-based host, which is currently down.

During normal operations, applications can determine the host status via the *Get the Host State* function of the PeriProducer System block, or via host control status messages. (See ***Host Availability*** on page 38.)

The following command displays information about the Virtual Terminals assigned to the specified lines. Generally, this command is issued only from the VSH command line.

host# svcid #[-#] read

Displays the contents of the screen buffers for the specified lines. This command is valid only for hosts running in screen mode.

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4

Virtual Terminal Configuration

This chapter covers:

1. **Assigning VT(s) to applications**
2. **VT pooling configuration**
3. **VT status information**
4. **Application programming notes**

4. Virtual Terminal (VT) Configuration

Virtual Terminal Overview

When communicating with an external host computer, most types of Nortel Networks Media Processing Server Series (MPS) applications are treated by the host as an end-user terminal. Messages are sent to the application in the same manner as being transmitted to a terminal screen. Messages sent from applications appear to the host as if they were sent from a terminal's keyboard.

Applications emulate the functions of a terminal operator by using *Virtual Terminals (VTs)*. Essentially, VTs are software and memory resources within the Media Processing Server (MPS) that are allocated to applications either on a permanent or as-needed (i.e., pooled) basis. (See ***Virtual Terminal Pooling*** on page 44.)

To configure application-VT assignments, an application is associated with a COMMGR *service identifier*. The service ID is used internally to map applications to their respective VTs, configure an application's host-related parameters, generate reports, and debug host and MPS applications. Service identifiers are specified by including the **`svcid`** keyword in commands. (See ***Virtual Terminal Range Commands*** on page 21.)

The following is important information about the use of service identifiers:

- During run-time, the service identifier for an application is internally mapped to the phone line on which it is running. Thus, a reference to a particular service identifier denotes a specific application and phone line.
- The number of applications that can bind to COMMGR at one time is 512. This limit cannot be altered. Valid COMMGR service identifiers range from 1 to 512.

Virtual Terminal Assignments

The phrase *Virtual Terminal assignment* refers to host-application mapping. By default, one-to-one assignments are made between applications and VTs, if the host is not a pooled host and no VT assignment commands are issued. To change the default mappings, use the following commands:

`host # svcid #[-#] assignvt <vt#>`

Assigns a single VT to a specific service identifier, or a set of VTs to a range of service identifiers, where:

- **`#`** is the host number (1-8).
- **`#[-#]`** is the service identifier for one or more applications.
- **`<vt#>`** is the (starting) VT number (1-256).

`host # svcid #[-#] unassignvt`

Undoes the VT assignment for a single application or range of applications.

The following is important information about VT assignments:

- To change the host/VT with which it is communicating, the application must either issue the **`session`** command as an Environment function (see ***Host Session Assignment*** on page 25) or use Virtual Terminal pooling. (See ***Virtual Terminal Pooling*** on page 44.)
- By default, if there are no pooling or **`assignvt`** commands in the `commgr.cfg` file for a given host, each application is assigned a VT for that host in one-to-one correspondence (i.e., VT 1 is assigned to the first application, VT 2 is assigned to the second application, etc.). These default assignments are equivalent to having **`assignvt`** commands for each application.
- For a given host, if any pooling or **`assignvt`** commands are specified in the `commgr.cfg` file, the default assignments are not made.
- If a range of service IDs is specified in the **`assignvt`** command, the service ID numbering begins with the starting VT and subsequent VTs are assigned incrementally in ascending order. The service ID range must be a continuous series (e.g., a specification of **`1-3,5`** is invalid).
- For an async hosts, VT assignments must be made in one-to-one correspondence.
- The following error message is displayed when an application attempts to send data to the host, with an invalid VT assignment.

```
Wed Jul 17 09:39:40 <commgr> 11055 Severity 3 Mps <#>
Invalid vt number, async host only allowed 1 to 1 mapping
of vt to line.
```

Virtual Terminal Pooling

The *VT pooling* feature of the MPS allows flexible and dynamic allocation of VTs to applications based on their service IDs. The VTs in the pool are allocated to and de-allocated from applications as-needed, allowing them to be shared in a manner that efficiently uses system resources.

When an application requires host access, it requests allocation of a VT from the pool. When the VT is no longer required, the VT is freed by the application and returned to the pool. If one of the VTs in the pool is down, the COMMGR can allocate a different VT from the pool, if one is available.

VT pooling cannot be used with hosts defined as **`async`** (see ***Manager-Type Protocol Configuration*** on page 23) and is valid for use only with hosts running in **`screen`** mode (see ***Host Mode Configuration*** on page 27).

VTs from different hosts can be configured in the same VT pool and multiple pools can be defined. However, no single-host VT can exist in more than one pool. The following tables illustrate VT pooling configurations:

Configuration Type		Pool A		Pool B	
Pool(s)	**Host(s)**	**Host 1**	**Host 2**	**Host 1**	**Host 2**
Single	Single	VTs 1-12	----	----	----
Multiple	Single	VTs 1-6	----	VTs 7-12	----
Multiple	Multiple	VTs 1-6	VTs 1-6	VTs 7-12	VTs 7-12

Example: Valid two-pool configuration. Note that all VTs defined for a specific host are assigned to only one pool.	Pool A		Pool B	
	Host 1	**Host 2**	**Host 1**	**Host 2**
	VTs 1-4	VTs 5-8	VTs 5-8	VTs 1-4

Example: Invalid configuration. Pool B contains VTs from host 1 (VTs 1-4) that are already assigned to Pool A.	Pool A		Pool B	
	Host 1	**Host 2**	**Host 1**	**Host 2**
	VTs 1-4	VTs 5-8	VTs 1-4	VTs 1-4

VT Allocation to Applications

If there is only one defined VT pool, an application always uses that pool as the *current pool*. If multiple pools are defined, the application can allocate VTs from different pools, by specifying which pool to use when it requests a VT. An application can only allocate one VT from any single pool at one time.

A VT is allocated using the Environment **getvt <poolname>** command. If a VT is successfully allocated, no condition is returned and the application continues executing.

If a VT cannot be allocated (e.g., all VTs in the pool are in use, the timeout period expires, the pool's hosts is down, etc.), the ***hostfail*** condition is returned. Generally, this condition should be handled for every Environment **getvt** command. Upon failure, the application can attempt to allocate a VT from the same pool after a brief pause, or after repeated attempts, the application could ask the caller to try calling again later. If other pools are configured, the application can request a VT from a different pool.

After a VT has been successfully allocated, the application can perform normal host transactions (e.g., Send/Receive Text/Map, AID keys, etc.). The application should then change the handling of the ***hostfail*** condition to manage host transaction failures.

After the VT is allocated, the pool from which it came becomes the application's current pool. The current pool can be changed with the Environment **usepool** command. This command is needed after an Environment **session** command to use a previously allocated pooled VT.

When the VT is no longer required, it should be returned to the same VT pool using the Environment **freevt** command. If the application does not explicitly free the VT with this command, the VT is freed by the system when the application ends its current execution run.

While a VT is allocated to an application line, VT-specific parameters can be dynamically changed using Environment **parameter** commands. The changes affect only the current host session set by the **usepool** (or **session**) command. In the Environment command, specify "**$VT**" in place of the VT number, which instructs the COMMGR to insert the application's VT number when the command is processed.

For more information about application Environment commands, see the *PeriProducer User's Guide*.

VT Pooling Configuration

The commands that configure VT pooling are issued from the `commgr.cfg` file. To properly configure VT Pooling, perform the following steps:

- Define the VT pools to be used by applications to the COMMGR.
- Assign particular VTs to the defined pools.
- Set each pool's timeout value for application-issued **`getvt`** requests.
- Specify the access method for each pool.

After they have been defined, pools cannot be added or removed while the system is online. Individual VTs can be dynamically assigned to and removed from defined pools when the system is active, but this is generally not recommended. (See ***Removing VTs from a Pool*** on page 53.)

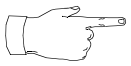
To ensure that VTs are returned to the pools from which they came, it is important that applications terminate gracefully. In general, this means that they should terminate under their own control or from PeriView. Never use the Solaris **`kill -9`** command or the Windows NT Task manager to remove an application from the system.

VT Pooling Commands

All commands for configuring VT pooling are issued using the following syntax. After the first command of this format is issued, the host becomes a *pooled host*.

`host # pool <poolname> [command]`

Specifies a configuration command that is to be applied to the indicated VT pool. This syntax is used to precede all VT pooling commands.



The following is important information regarding VT pooling commands:

- VT pooling is only valid for hosts that are configured as type *non-async* (see ***Host Mode Configuration*** on page 27) and running in *screen* mode (see ***Host Mode Configuration*** on page 27).
- The first time any **`host # pool <poolname> [command]`** is executed, the specified pool becomes defined for the indicated host. Also, that pool is then treated as the current pool, until another pooling command is issued that specifies a different pool name.
- By default, if there are no **`pool`** or **`assignvt`** commands in the `commgr.cfg` file for a given host, each physical phone line is assigned a VT for that host in a one-to-one correspondence (i.e., VT 1 is assigned to phone line 1, VT 2 is assigned to phone line 2, etc.). These default assignments are equivalent to having **`assignvt`** commands for each application phone line. The default assignments are made during system initialization.
- If any **`pool`** or **`assignvt`** commands are specified in the `commgr.cfg` file for a given host, the default assignments are not made for that host.
- After it has been assigned to a pool, it can be removed using the **`remove_vt`** command. (See ***host # pool remove_vt <#>*** on page 53.)

VT Pooling Assignment

To configure a VT pool, a list of VTs from one or more hosts is assigned to that pool using the **vtlist** command in the `commgr.cfg` file:

host # pool <poolname> vtlist #[-#]

Assigns one VT or a range of VTs to a specific pool (**poolname**) for the indicated host. The **vtlist #[-#]** parameter specifies a single VT or a range of VTs to be assigned. If multiple VTs are to be assigned, they must be consecutively numbered.

In a multi-host configuration, VTs for each host can be assigned to the same pool(s). If one of the hosts goes down, it's VTs become unusable. However, the VTs for the other hosts are still active, and thus the pool(s) can still be used.

The following is an example of a VT pooling assignment configuration produced by the indicated excerpts from a sample `commgr.cfg` file:

Pool A		Pool B		Pool C	
Host 1	**Host 2**	**Host 1**	**Host 2**	**Host 1**	**Host 2**
VTs 1-4	VTs 1-4	VTs 5-8	VTs 5-8	VTs 9-12	VTs 9-12

```
# DEFINE VT POOLS

#
# Define PoolA
host1 pool PoolA vtlist 1-4
host2 pool PoolA vtlist 1-4

# Define PoolB
host1 pool PoolB vtlist 5-8
host2 pool PoolB vtlist 5-8

# Define PoolC
host1 pool PoolC vtlist 9-12
host2 pool PoolC vtlist 9-12
```

VT Pooling Timeout Value

The pool timeout value denotes the maximum amount of time an application waits for a VT to be allocated. If this timer expires, the ***hostfail*** condition is generated to the application. The value specified for this command is used for all VTs in the pool, regardless of the host number specified in the command.

`host # pool <poolname> pooltimeout <#>`

Specifies the timeout value of application requests for the VTs in the pool specified as the **`<poolname>`** parameter. This timer value (**`<#>`**) is specified in seconds and must be between **`0`** and **`300`** inclusive. The default is **`5`** seconds.

The following is some important information regarding the use of this command:

- If **`pooltimeout`** is set to **`0`**, a **`getvt`** request times out immediately if no VTs are available.
- If a **`getvt`** request fails on the first try, a message can be played to the caller from the application (e.g., to inform him or her of the delay), then the request can be tried again.

VT Pooling Access Method

The VTs in a pool can be accessed by one of two methods: *sequential* or *non-sequential*. Regardless of the access method, the lowest numbered host in a pool is always favored.

- Sequential access allocates the lowest numbered available VT to the requesting line. As examples, if VTs 2 and 5 were both available, VT 2 would be assigned upon the next request. If VT 2 from host 1 is available and VT 1 from host 2 is available, VT 2 from host 1 is allocated first.
- Non-sequential access uses a queuing method of allocating VTs, often referred to as the *round robin* technique. Here, a list of available VTs is maintained. Upon request from an application, the first VT in the list is the one that is assigned. When the VT is freed, it goes to the end of the list.

The access mode is set by the following command:

host # pool <poolname> {sequential | nonsequential}

Specifies the type of access that applications have to the VTs in the pool identified by the **<poolname>** parameter.

- The **sequential** option specifies that the lowest numbered VT in the pool is allocated to the requesting line.
- The **nonsequential** option uses a queuing technique, where the next available VT is allocated regardless of its numeric designation. The default is **nonsequential**.

Like sequential access, for nonsequential access, the next VT available from the lowest numbered host is also allocated first. If all VTs from host 1 are allocated and a VT from host 2 is available, the VT from host 2 is used. If VT 3 from host 1 then becomes available, VT 3 from host 1 is assigned to the next requesting line, even if VT 2 from host 2 is available.

Nonsequential access generally equalizes VT usage. This is different than sequential access, where the lower numbered VTs are used first and more often. In a sophisticated data processing environment, host message traffic can be complex, and using the same subset of VTs can create message backlogs that reduce the efficiency of the overall system. Sequential access should be used only if these VTs can handle the extra message traffic. Use nonsequential access if this is a relevant issue.

The following is an example of nonsequential pool access. In this example, the available VTs are numbered 1, 2, 3, 4, and 5.

Action	Available VTs
1. Initial state of pool.	1 2 3 4 5
2. Three VTs are requested. VTs 1,2, and 3 are allocated.	4 5
3. VT 2 is freed by its line.	4 5 2
4. VT 3 is freed by its line.	4 5 2 3
5. The next VT is requested.	5 2 3
6. VT 1 is freed by its line.	5 2 3 1
7. VT 4 is freed by its line.	5 2 3 1 4

Selecting the Current Pool

For systems with multiple defined pools, an application can specify which pool is the current pool with the Environment block's **`usepool`** command. This is necessary if an application switches hosts during a transaction.

To use a previously allocated VT, the **`usepool`** command must be specified after the Environment **`session`** command (see ***Host Session Assignment*** on page 25).

`host # svcid #[-#] usepool <poolname>`

Switches the current pool to the specified **`<poolname>`**. This command is normally issued from applications on an as-needed basis. The host and service ID numbers are only necessary if this command is issued from the `commgr.cfg` file or command line.

If there is only one defined pool, the **`usepool`** command is never needed. The current pool is always the only defined pool.

Example Configuration

The following example set of commands configures two VT pools with the indicated characteristics:

Configuration for VT Pooling

Pool A			Pool B	
Host 1	**Host 2**	**Host 3**	**Host 1**	**Host 2**
VTs 1-4	VTs 5-8	VTs 1-4	VTs 5-8	VTs 9-12
(10 second timeout, sequential access)			(20 second timeout, nonsequential access)	

```
#
# Define the first pool - poola
#
# VTs 1-4 from host 1
host1 pool poola vtlist 1-4
#
# VTs 5-8 from host 2
host2 pool poola vtlist 5-8
#
# VTs 1-4 from host 3
host3 pool poola vtlist 1-4
#
# Set the timeout to 10 seconds
host1 pool poola pooltimeout 10
#
# Set the pool to sequential access
host1 pool poola sequential
#
# Define the second pool - poolb
#
# VTs 5-8 from host 1
host1 pool poolb vtlist 5-8
#
# VTs 1-4 from host 2
host2 pool poolb vtlist 1-4
#
# Set the timeout to 20 seconds
host1 pool poolb pooltimeout 20
#
# Set the pool to nonsequential access
host1 pool poolb nonsequential
```

Removing VTs from a Pool

Although pool definitions cannot be changed once the system has been initialized (i.e., new pools cannot be added), individual VTs can be dynamically assigned and removed from the existing pool(s). Upon removal from a pool, a VT is immediately available to be assigned to a different (or the same) pool using the **`vtlist`** command. (See ***host # pool <poolname> vtlist #[-#]*** on page 48.)

The following command is used to remove VTs from their assigned pools:

`host # pool remove_vt <#>`

Removes the VT indicated by **`<#>`** from the particular pool specified by the **`<poolname>`** parameter.

The **`remove_vt`** command is intended for use only while the system is idle (i.e., when no calls are in progress). VT assignments should only be changed dynamically to find optimal VT/pool assignments for equal pool usage. Once the optimal assignments have been determined, modify the **`vtlist`** commands in `commgr.cfg` to reflect these assignments. Note that the system must be rebooted for the changes in `commgr.cfg` to take effect.

Using **`remove_vt`** while calls are in progress can result in a loss of host session for the application.

The status of VT pools can be ascertained at anytime by entering the **`poolstatus`** command at the VSH tool. (See ***Determining the Status of a Defined VT Pool*** on page 57.)

The following is an example of removing a VT from a pool designated as `poola` (originally containing VTs 1-4) and assigning it to `poolb` (originally containing VTs 5-7).

```
vsh.1 {20} host1 pool poola poolstatus

Pool Name            : poola
Allocation method    : Non-Sequential
Allocation Wait Time : 5 seconds
Virtual Terminal List: VNum/Service ID
Host 1              :[  1/ - ], [  2/ - ], [  3/ - ], [  4/ - ]

vsh.1 {21} host1 pool poola remove_vt 1
vsh.1 {22} host1 pool poola poolstatus

Pool Name            : poola
Allocation method    : Non-Sequential
Allocation Wait Time : 5 seconds
Virtual Terminal List: Num/Service ID
Host 1               :[  2/ - ], [  3/ - ], [  4/ - ]

vsh.1 {23} host1 pool poolb vtlist 1
vsh.1 {24} host1 pool poolb poolstatus

Pool Name            : poolb
Allocation method    : Sequential
Allocation Wait Time : 5 seconds
Virtual Terminal List: Num/Service ID
Host 1              :[  1/ - ], [  5/ - ], [  6/ - ], [  7/ - ]
```

Virtual Terminal Status Information

The commands discussed in this section provide information about the system's use of VTs and VT pools.

Host/VT Status Information

If an application is using a pooled VT, status information can be obtained using the following variation of the **`host# status`** command.

`host# svcid # status`

Displays status information, including VT configuration, for the application with the specified service ID.

Examples:

```
vsh#mps.1 {1} -> host1 svcid 1 status

Host Service Id   1
-------------------
Acquired By    : <none>
Host Control   : off
Timers         : er: 30 inter: 10
Aid            : enter
System mode    : Non Pooling
Sessioned Host: 1
VT# for Host 1: 1
VT status      : Keyboard Unlocked, No input,
                 VT up
                 Waiting for 1 unlocks, 0 left
```

```
vsh#mps.1 {1} -> host1 svcid 1 status

Host Service Id   1
-------------------
Acquired By    : acquire (cd: 9 handle: 2)
Host Control   : off
Timers         : er: 30 inter: 10
Aid            : enter
System mode    : Non Pooling
Sessioned Host: 1
VT# for Host 1: 1
VT status      : Keyboard Unlocked, No input,
                 VT up
                 Waiting for 1 unlocks, 0 left
```

Field	Description
`Host Service Id`	Service ID of the application for which status information is displayed.
`Acquired By`	Internal MPS information about the particular application.
`Host Control`	Status of host messages to the application. This is shown as either `on` or `off`. This is set by the **`hostctl`** command. (See ***Keyboard Status*** on page 36.)
`Timers`	Shows the values of the enquiry-response and intermediate timers, which are set using the **`er`** and **`inter`** commands. (See ***Host Response Timers*** on page 35.)
`Aid`	Default AID key for the host. (See ***AID Keys*** on page 37.)
`System mode`	Whether or not the application is using VT pooling.
`Sessioned Host`	The logical designation of the current host.
`VT# for Host 1`	Numeric designation of the VT used by the application to interface with the host. If there is no VT currently associated with the application's service ID, the word `<none>` is displayed.
`VT Status`	General information about the current state of the VT.

Determining the Status of a Defined VT Pool

The **poolstatus** command allows you to determine the status of a VT pool. This command displays pooling information for all poolable hosts (i.e., non-async hosts running in **screen** mode). The information list is blank for each host that has no VTs allocated to the pool.

host # pool <poolname> poolstatus

Displays configuration parameters for the specified **<poolname>**.

Example:

```
vsh#mps.1 {2} -> host1 pool poola poolstatus

Pool Name             : poola
Allocation method     : Non-Sequential
Allocation Wait Time  : 5 seconds
Virtual Terminal List: VT Num/Service ID
Host 1   :  1/ - ,   2/ - ,    3/ - ,    4/ - ,    5/ - ,
         :  6/ - ,   7/ - ,    8/ - ,    9/ - ,   10/ - ,
         : 11/ - ,  12/ - ,   13/ - ,   14/ - ,   15/ - ,
         : 16/ - ,[ 17/ - ],[ 18/ - ],[ 19/ - ],[ 20/ - ]
```

Field	Description
Pool Name	Shows the particular pool for which status information is displayed. This name is specified by the user in the **<poolname>** parameter and is defined to the system by the first command of the form **host # pool <poolname> [command]** issued from the commgr.cfg file. (See ***VT Pooling Commands*** on page 47.)
Allocation method	Indicates the method used to allocate individual VTs from the pool to requesting applications. There are two methods: sequential and nonsequential. (See ***VT Pooling Access Method*** on page 49.)
Allocation Wait Time	Shows the amount of time allotted to satisfy an application's request for VT allocation before the system times out. (See ***VT Pooling Timeout Value*** on page 49.)
Virtual Terminal List	Displays the VTs assigned to the specified pool and to which applications (if any) they are currently assigned. The VTs that are currently available are listed first. VTs that are currently assigned to lines are listed next. At the end are the designations of VTs that are currently down. (These are shown in brackets.)

The available VTs are listed according to their allocation method (i.e., sequential or nonsequential.) If the pool uses sequential access, after an application frees a VT, it is returned to the pool in the proper numerical sequence. For example, assume VT 1 is allocated and then freed. The list of available VTs displayed by the **poolstatus** command is illustrated below. This example assumes that there is one host with four VTs assigned to the pool:

```
Host 1 : 1/ -, 2/ -, 3/ -, 4/ -0     {VT 1 is available.}
Host 1 : 2/ -, 3/ -, 4/ -, 1/ 2      {VT 1 is allocated to service ID 2.}
Host 1 : 1/ -, 2/ -, 3/ -, 4/ -      {VT 1 is freed.}
```

If the pool is configured for nonsequential access, after a VT is allocated and freed from an application, the VT becomes the last available one in the pool. The following example uses the same pool configuration as the previous example, except that the access method is nonsequential. Note that when VT 1 is returned to the pool, it is put at the end of the list:

```
Host 1 : 1/ -, 2/ -, 3/ -, 4/ -      {VT 1 is available.}
Host 1 : 2/ -, 3/ -, 4/ -, 1/ 2      {VT 1 is allocated to service ID 2.}
Host 1 : 2/ -, 3/ -, 4/ -, 1/ -      {VT 1 is freed.}
```

Displaying VT Pooling Statistics

To display the number of times the VTs associated with a particular host and pool have been successfully allocated to application lines, issue the **poolrequest** command. This command shows status information including the numeric designations of the VTs in the specified pool and the number of times each has been successfully used.

Rebooting the system resets the allocation statistics to `0`.

host # pool <poolname> poolrequest

Displays status information about the VTs in the specified pool (**<poolname>**) pertaining to the number of successful application requests for the VTs.

Example:

```
vsh#mps.1 {3} -> host1 pool poola poolrequest

Pool Name             : poola
Allocation method     : Non-Sequential
Allocation Wait Time  : 5 seconds
Virtual Terminal List: VT Num-VT Req
Host 1                :  1-9,  2-4,  3-5,  4-6,  5-6,
                      :  6-6,  7-4,  8-1,  9-8, 10-4,
                      : 11-3, 12-5, 13-6, 14-2, 15-6,
                      : 16-2, 17-6, 18-4, 19-9, 20-4
```

Field	Description
`Pool Name`	Shows the particular pool for which status information is displayed. This name is specified by the user in the **<poolname>** parameter and is defined to the system by the first command of the form **host # pool <poolname> [command]** issued from the `commgr.cfg` file. (See ***VT Pooling Commands*** on page 47.)
`Allocation method`	Indicates the method used to allocate individual VTs from the pool to requesting applications. There are two methods: sequential and nonsequential. (See ***VT Pooling Access Method*** on page 49.)
`Allocation Wait Time`	Shows the amount of time allotted to satisfy an application's request for VT allocation before the system times out. (See ***VT Pooling Timeout Value*** on page 49.)

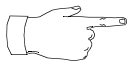
Field	Description
`Virtual Terminal List`	Displays information about the VTs in the specified pool in the format `xx - yy`, where `xx` denotes the number of a particular VT and `yy` indicates the number of times it has been used by applications. For nonsequential access, the number of successful allocations for each VT should be fairly equal within each host grouping. A VT with an unusually low number of successful allocations might not be operating properly. In general, for sequential access, the lower-numbered VTs for each host will have more allocations than the higher-numbered VTs for that host. However, this depends on factors such as system load and the specific uses of applications.

Resetting VT Pooling Statistics

To reset the allocation statistics shown in the **`poolrequest`** report, use the following command:

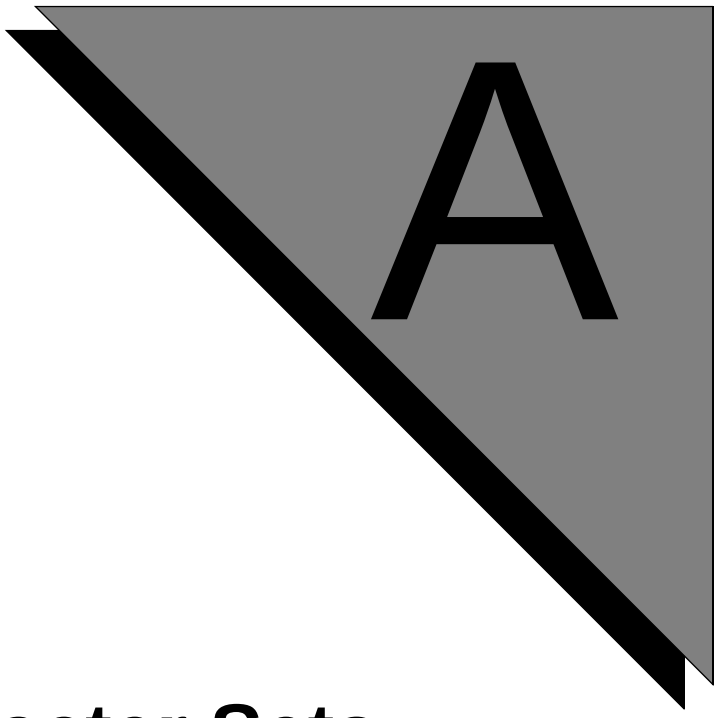
`host # pool <poolname> poolinitrequest`

Resets the allocation statistics. This is useful in determining VT usage profiles during selected time periods.



The following is important information about VT Pooling statistics:

- After rebooting, if host 1 is defined and is a pooled host, any **`host 1 svcid ## status`** commands show the system mode as "`Pooling`". For all other hosts (even if there is no host 1), the System mode is displayed as "`Non-pooling`" and the Sessioned Host is displayed as "`1`".
- A service identifier must be explicitly associated with a host session (either by means of the **`host # session`** command on the console or an Environment **`session`** command in the application) to display the currently assigned VT (if any) in the **`host # svcid ## status`** command (unless the default to session 1, as described above, has occurred).



Host Character Sets (LU6.2, VPSTN3270)

This chapter covers:

1. **EBCDIC for LU6.2**
2. **EBCDIC for VPSTN3270**

A. Host Character Sets

Overview

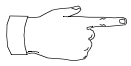
On a Nortel Networks Media Processing Server Series (MPS) system, character set conversion tables can be tailored for host computers and applications that use the LU6.2 or VPSTN3270 protocols. This entails having two character set map files. For Solaris systems, the files are stored in the `$VPSHOME/common/etc` directory: For Win/NT systems, the files are stored in the `%VPSHOME%\common\etc` directory.

File	Description
`<charset>.2host.charset`	Maps the local node character set to a custom character set for outbound data transmissions to the external host.
`<charset>.2local.charset`	Maps inbound data transmissions from the external host to the local node's character set.

Commands

The particular character set to be used is specified with one of the following commands. Use whichever is appropriate for the protocol, specifying the identifying portion of the file pair names as the **`<charset>`** argument.

Protocol	Command	Location
LU6.2	**`appc_cm host_charset <charset>`**	`appc_cm.cfg`
VPSTN3270	**`vpstn3270 host_charset <charset>`**	`vpstn3270.cfg`



If the command is not entered in the indicated location, it might not be executed in the proper sequence with respect to other necessary position-dependent configuration commands:

- For LU6.2, if the **`appc_cm host_charset`** command is not specified in the `appc_cm.cfg` file, the Brixton EBCDIC character set mapping is used.
- For VPSTN3270, if the **`vpstn3270 host_charset`** command is not specified in the `vpstn3270.cfg` file, the original VPSTN3270 character set mapping is used.

File Format

The character set mapping files are set up such that the order of the hexadecimal values in the `2local` file matches the corresponding values in the host character set, and the order of the hex values in the `2host` file matches the corresponding values in the local node's character set. To perform the conversion, the local node character value is used as an index into the list of values in the `2host` file to find the corresponding character in the host's character set, and vice versa.

Additionally, the file format must adhere to the following rules:

- Lines that start with `"#"` are comments. The `"#"` must be the first character on the line.
- The character set is specified as a series of two-digit hexadecimal values.
- Lines that are not comments can only contain a list of hex values.
- There must be exactly 256 values in the file. Any more or less will cause errors.

The following are the results if the file identified in the **`host_charset`** command contains errors:

- For LU6.2, any errors in the specified file result in the immediate termination of the APPC_CPI process. Information about the error is written to the `alarm.log` file.
- For VPSTN3270, any errors in the specified file results in the system using the original VPSTN3270 character set mapping.

Sample Files

The following are examples of two EBCDIC US character set files suitable for use with the LU6.2 and VPSTN3270 protocols.

Sample `ebcdic-us.2host.charset` File

```
#
# ebcdic-us.2host.charset
#
# This character set is used when Host is using ebcdic-us
# character set and local node is using ascii character set.
# This charset is used to map local ascii charset to host
# ebcdic-us charset.
#
#  ascii to ebcdic-us mapping
#
#
# 00 - 1f All these map to EBCDIC blanks.
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
# 20 - 2f
40 5a 7f 7b 5b 6c 50 7d 4d 5d 5c 4e 6b 60 4b 61
# 30 - 3f
f0 f1 f2 f3 f4 f5 f6 f7 f8 f9 7a 5e 4c 7e 6e 6f
# 40 - 4f
7c c1 c2 c3 c4 c5 c6 c7 c8 c9 d1 d2 d3 d4 d5 d6
# 50 - 5f
d7 d8 d9 e2 e3 e4 e5 e6 e7 e8 e9 40 e0 40 40 6d
# 60 - 6f
79 81 82 83 84 85 86 87 88 89 91 92 93 94 95 96
# 70 - 7f
97 98 99 a2 a3 a4 a5 a6 a7 a8 a9 c0 6a d0 a1 40
# 80 - 9f All these map to EBCDIC blanks.
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
# a0 - af
40 40 4a 40 40 40 6a 40 40 40 40 40 5f 40 40 40
# b0 - ff All these map to EBCDIC blanks.
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
# End-of-file
```

Sample `ebcdic-us.2local.charset` File

```
#
# ebcdic-us.2local.charset
#
# This character set is used when Host is using ebcdic-us
# character set and local node is using ascii character set.
# This charset is used to map host ebcdic-us charset to local
# ascii charset.
#
# ebcdic-us to ascii mapping
#
#
#
# 00 - 0f
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
# 10 - 1f
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
# 20 - 2f
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
# 30 - 3f
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
# 40 - 4f
20 20 20 20 20 20 20 20 20 20 a2 2e 3c 28 2b 20
# 50 - 5f
26 20 20 20 20 20 20 20 20 20 21 24 2a 29 3b ac
# 60 - 6f
5F 2F 20 20 20 20 20 20 20 20 7C 2c 25 5f 3e 3f
# 70 - 7f
20 20 20 20 20 20 20 20 20 60 3a 23 40 27 3d 22
# 80 - 8f
20 61 62 63 64 65 66 67 68 69 20 20 20 20 20 20
# 90 - 9f
20 6a 6b 6c 6d 6e 6f 70 71 72 20 20 20 20 20 20
# a0 - af
20 7e 73 74 75 76 77 78 79 7a 20 20 20 20 20 20
# b0 - bf
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
# c0 - cf
7B 41 42 43 44 45 46 47 48 49 20 20 20 20 20 20
# d0 -df
7D 4A 4B 4C 4D 4E 4F 50 51 52 20 20 20 20 20 20
# e0 - ef
5C 20 53 54 55 56 57 58 59 5A 20 20 20 20 20 20
# f0 - ff
30 31 32 33 34 35 36 37 38 39 20 20 20 20 20 20
#End-of-file
```

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