

# VSI OpenVMS

## VSI TCP/IP Version 10.5 Early Adopter's Kit

### Cover Letter and Release Notes

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*August 2018*

This document describes features and release notes for VSI TCP/IP for OpenVMS Version 10.5, VSI's new networking stack. VSI TCP/IP for OpenVMS V10.5 is an Early Adopter's Kit (EAK) intended for use in an evaluation environment. The EAK offers VSI OpenVMS customers an opportunity to gain experience with the new VSI networking stack in advance of the final production release.

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# Preface

## VSI TCP/IP for OpenVMS Version 10.5 Cover Letter

VMS Software, Incorporated (VSI) is pleased to introduce the VSI TCP/IP for OpenVMS Version 10.5 Early Adopter's Kit (EAK). This networking stack, owned and built by VSI, is supported on VSI OpenVMS Integrity V8.4-2L1.

### Intended Audience

This document is intended for all users of VSI TCP/IP V10.5. Read this document, as well as those in the following list, before you install this product on your VSI OpenVMS system:

- *VSI TCP/IP for OpenVMS Installation and Quick Start Guide*
- *VSI TCP/IP for OpenVMS User's Guide*
- *VSI TCP/IP for OpenVMS Software Product Description (SPD)*

### Document Structure

This document contains the following sections:

- *Prerequisites*: Products and configuration conditions required by VSI TCP/IP V10.5.
- *Release notes*: Release notes introduced in the current release. A subheading for each release note indicates the version of origin (for example, *Version 10.5*).
- *Appendix A*: Considerations for environments that use Cluster over IP.
- *Guide to Documentation*: An overview of the VSI TCP/IP for OpenVMS Documentation Set. All VSI TCP/IP for OpenVMS V10.5 manuals are provided in PDF format.

### Kit Contents

The VSI TCP/IP for OpenVMS V10.5 EAK kit is provided as a ZIPEXE file comprised of these files:

File	Description
VSI-I64VMS-VSI_TCPIP-V1005--1 .PCSI\$COMPRESSED	Signed PCSI installation file for the VSI TCP/IP Version 10.5 Early Adopter's Kit
VSI-I64VMS-VSI_TCPIP-V1005--1 .PCSI\$COMPRESSED_VNC	A manifest file that contains data about the type of signature generated for the VSITCPIP.PCSI kit and a certificate chain containing the public key used to decrypt the signature. The manifest file is used by the VSI VMS_NOTARY program to validate the content of the original target file.
VSI-I64VMS-VMS842L1I_CLUCONFIG- V0100—4.PCSI\$COMPRESSED	Signed PCSI installation file for the VSI OpenVMS Cluster Configuration patch kit.
VSI-I64VMS-VMS842L1I_CLUCONFIG- V0100—4.PCSI\$COMPRESSED_VNC	A manifest file that contains data about the type of signature generated for the VSI OpenVMS Cluster Configuration PCSI kit and a certificate chain containing the public key used to decrypt the signature. The manifest file is used by the VSI VMS_NOTARY program to validate the content of the original target file.
Documentation Files	All VSI TCP/IP for OpenVMS V10.5 manuals are provided in PDF format. Please refer to this document's <i>Guide to Documentation</i> for the complete list of documents.

## Features

VSI TCP/IP Version 10.5 for OpenVMS is a new OpenVMS TCP/IP network stack produced and supported by VMS Software, Inc. Based on Process Software's MultiNet for OpenVMS TCP/IP stack, VSI TCP/IP includes the following features:

- VSI TCP/IP for OpenVMS is a standalone product, installable and supported on VSI's OpenVMS Integrity V8.4-2L1 operating system.
- VSI TCP/IP for OpenVMS product usage is enabled by the VSI OpenVMS Integrity BOE license; no additional license is required.
- VSI TCP/IP for OpenVMS has been engineered to co-exist on an HPE Integrity system disk that contains other network stacks.
- When other network stacks are present on the system disk, VSI TCP/IP for OpenVMS software allows you to select the stack you prefer, switch to your chosen stack, and then switch back again, if desired. The command procedure `SY$MANAGER:IP$SET_STACK` allows you to switch between VSI TCP/IP, TCP/IP Services, or MultiNet TCP/IP without having to modify your system startup procedure each time. It does not install or remove any product on your system.
- VSI TCP/IP's SSH provides modern ciphers through the inclusion of the Suite B compliant implementation of the Secure Shell Transport Layer Protocol and the Secure Shell Authentication Protocol.
- Users who are familiar with the MultiNet for OpenVMS networking stack will be able to set up and configure VSI TCP/IP for OpenVMS using tools that look and feel like those provided by MultiNet.

**Note:** *As an Early Adopter's Kit, VSI TCP/IP for OpenVMS V10.5 is intended for use in an evaluation environment.*

## Prerequisites

Please note the following prerequisites for VSI TCP/IP Version 10.5:

1. VSI TCP/IP V10.5 requires a fresh installation. No upgrade paths are available. You can run VSI TCP/IP on VSI OpenVMS Integrity Version 8.4-2L1 or higher.
2. VSI TCP/IP V10.5 requires the use of ODS-5 system disks. If you attempt an installation on a system disk that is not ODS-5, you will see a message similar to the following:

```
Configuring VSI I64VMS VSI_TCPIP V10.5: VSI TCP/IP for OpenVMS
IA64
```

```
©Copyright 2018 VMS Software, Inc.
```

```
VSI TCP/IP requires installation on an ODS-5 system disk.
The disk on which you are installing, $1$DGA150:, is not an ODS-5
disk.
```

```
Current IP stack: TCP/IP Services
Running: yes
Cluster over IP: no
```

3. VSI TCP/IP V10.5 requires the installation of an OpenVMS patch kit, VMS842L1I\_CLUCONFIG-V0100.PCSI\$COMPRESSED which is distributed in the same directory as the VSI TCP/IP V10.5 kit. If this patch kit is not installed first, or at the same time as, VSI TCP/IP, the VSI TCP/IP V10.5 installation will fail.
4. VSI WBEM Services (WBEMCIM) V3.0-C180108 for VSI OpenVMS Integrity Servers is required for compatibility with VSI TCP/IP V10.5. VSI highly recommends that you install the WBEMCIM kit prior to installing VSI TCP/IP V10.5.

If WBEM Services V3.0-C180108 is not installed, the following messages are displayed by the WBEM services configuration, startup and shutdown procedures.

```
LCKHVN>> @sys$startup:wbem_services$startup
%SYSTEM-F-ABORT, abort
%RUN-S-PROC_ID, identification of created process is 23800460
%SYSTEM-F-ABORT, abort
%WBEMCIM-I-SERVERWAIT, Waiting for CIMServer to start. 180
seconds remaining...
%SYSTEM-F-ABORT, abort
%WBEMCIM-I-SERVERWAIT, Waiting for CIMServer to start. 170
seconds remaining...
```

VSI direct support customers can send email to [L1-support@vmssoftware.com](mailto:L1-support@vmssoftware.com) and obtain access to the kit. Please reference your VSI support contract number in the email. HPE direct support customers should access the kit via the HPE support site.

# VSI TCP/IP V10.5 Release Notes

## 1. Branding

*Version 10.5*

Copyright notices have been modified from Process Software's MultiNet to VSI TCP/IP. However, text that appears in some help files, display screens, or other areas may still say MultiNet. These will be updated in a future release of VSI TCP/IP.

## 2. Cluster Over IP

*Version 10.5*

VSI has observed problems in a cluster where SCS communications occur using the TCP/IP stack. In this configuration, known as OpenVMS Cluster over IP, the network interface designated for SCS communication is the IP Cluster Interconnect (IPCI). When an IPCI channel is the only path between two or more nodes in a cluster, problems may occur; they seem to be related to saturation of the IPCI channel by packet traffic.

To avoid problems, VSI recommends that IPCI configurations include one or more LAN paths between the nodes. For additional information, please refer to this document's Appendix A, *Considerations When Configuring VSI TCP/IP in Environments that Include OpenVMS Cluster Over Internet Protocol (IP)*.

## 3. Commands and Services Not Present in VSI TCP/IP V10.5

*Version 10.5*

VSI TCP/IP V10.5 does not include the following commands and services found in MultiNet. Note: BOOTP and TFTP will be added in a future release of VSI TCP/IP.

- Commands not present: DECODE, KERBEROS, MENU, RDATE
- Service names changed from those in MultiNet: NFS (in MultiNet, it was NFS3)
- Services not present: BOOTP, BWNFS, EKLOGIN, KADMIN, KLOGIN, KHELL, NFS2, PCNFS, POP2, REMIND, TFTP

## 4. DHCLIENT Use and Network Topologies

*Version 10.5*

DHCLIENT provides centralized assignment and management of IP addresses in conjunction with simple network topologies. However, VSI has observed problems with topologies that require definition of static routes that are outside of routes that can be supplied by DHCP. Customers with such use cases should contact VSI support [Support@vmssoftware.com](mailto:Support@vmssoftware.com) for possible workarounds. This problem will be addressed in a future release.

## 5. GATED OSPF Routing Protocol Failures

*Version 10.5*

When some OSPF configurations are enabled in GATED, the following assertion has been observed. The cause is still under investigation.

```
Nov 21 12:09:00 Assertion failed
$44$DKA100:[SYS0.SYSCOMMON.][IP.SYSEXEXE]GATED.EXE [24E0085A]: file
"OSPF_SPF.C", line 206: "0"
```

## 6. IP CONFIG/NFS SHOW MOUNT Does Not Show Client Host Mounts

*Version 10.5*

The SHOW MOUNT command of the NFS configuration utility does not work, producing no output regardless of the state of any NFS clients mounting exports on the local server. This problem will be addressed in an upcoming release of VSI TCP/IP.

## 7. IP SHOW/REMOTE May Result In Forced Exit

*Version 10.5*

When the target host specified by an IP SHOW/REMOTE command is not reachable, or the connection is refused because the target does not have the NETSTAT service enabled, a forced exit will occur indicating an improperly handled condition. This problem will be addressed in an upcoming release of VSI TCP/IP.

## 8. Issues with Jumbo Frames

*Version 10.5*

VSI has encountered issues with jumbo frames enabled and recommends against enabling jumbo frames on any VSI TCP/IP V10.5 interfaces.

## 9. MAIL Facilities (SMTP, POP, IMAP) Lack Modern Capabilities

*Version 10.5*

Mail support contained in VSI TCP/IP 10.5 lacks the security, virtualization, and spam avoidance features found in modern mail systems. If you require a production quality mail solution with VSI TCPIP, we recommend that you use PMDF, a complete and up-to-date messaging product available from Process Software. PMDF is a high performance standards-based Internet product suite that has been tested on VSI TCP/IP V10.5.

## 10. Network DCL Commands May No Longer Function

*Version 10.5*

Removal or installation of TCP/IP Services can result in the deletion of some network DCL commands. Please see the note "*Other Networking Products*" in the *Layered Products and Tools Release Notes* section for information on how you can restore the commands to your system.



## 11. NFS Interoperability: Some Applications Cannot Save Files to An NFS Share

*Version 10.5*

Some applications cannot save files to an NFS share exported by VSI TCP/IP. While testing NFS interoperability between Mac and Windows client systems and an NFS share exported by VSI TCP/IP, VSI has observed that Microsoft Word, PowerPoint, Excel, and Mac TextEdit cannot save files on the VSI TCP/IP NFS export. Other applications such as Wireshark, Notepad, and Mac BBEdit are able to successfully save files to the VSI TCP/IP NFS export.

Follow these steps to work around the problem:

1. Copy the application file from the VSI TCP/IP NFS share to the local client system.
2. Operate on the application file on the local client system.
3. Save the application file on the local client system.
4. Copy the application file back to the VSI TCP/IP NFS share.

This problem will be corrected in a future release of VSI TCP/IP.

## 12. Node Hangs When Booting Into a Cluster

*Version 10.5*

Removal or installation of TCP/IP Services can result in the deletion of some IPCI files, causing a node to hang when it attempts to boot into a cluster. Please see the note “*Other Networking Products*” in the *Layered Products and Tools Release Notes* section for information on how you can restore the IPCI configuration information.

## 13. Satellite Cluster Nodes Cannot Be Booted

*Version 10.5*

It is not possible to boot satellite cluster nodes from a system running VSI TCP/IP V10.5 because the BOOTP and TFTP services are not supported in this version. This will be corrected in a future release of VSI TCP/IP.

## 14. SCP Command Failures Observed Between Networking Stacks

*Version 10.5*

The following failures have been observed when using the SCP command between TCP/IP Services V5.7 and VSI TCP/IP V10.5. These failures will be addressed in a future release.

1. The TCP/IP Services V5.7 SCP command fails when attempting to transfer files to a VSI TCP/IP V10.5 server if the remote filename uses OpenVMS syntax.

VSI TCP/IP 10.5 does not recognize TCPIP Services V5.7 as an OpenVMS TCP/IP implementation. As a result, you must issue the SCP command using UNIX-style syntax for the remote file. OpenVMS syntax in remote filenames can be used when the server and the client both run VSI TCP/IP.

2. The VSI TCP/IP SCP command may fail with the following error:

```
$ scp
%CLI-F-SYNTAX, error parsing 'VMS' -CLI-E-ENTNF, specified entity
not found in command tables
```

To workaroud this issue either use the SCP2 command from within the IP command (IP SCP2 ...), or define the following foreign command:

```
SCP ::= $IP$SYSTEM:SCP2.EXE
```

3. The VSI TCP/IP SCP command fails to transfer remote files if the filename includes wildcards.

To successfully transfer files using SCP, surround the parts of the filename that are not wildcards and periods in double quotes. In the case of ODS2 files, the filename must be uppercase.

Here are examples of commands that fail:

```
$ scp "system@blade1"::*.*pl []
$ scp "system@blade1"::*.*PL []
```

Here are examples of commands that succeed:

```
$ scp "system@blade1"::*.*"PL" []
$ scp "system@blade1"::*.*"D"*. "PL" []
```

## 15. SSH Configuration Must Be Performed From SYSTEM Account

*Version 10.5*

VSI recommends that you configure SSH from the SYSTEM account only. Non-system accounts do not configure SSH correctly.

## 16. SSH Connections Are Not Logged When SSHD.log Files Reach Maximum Version Number

*Version 10.5*

When the SSHD.LOG file version reaches the maximum number of 32767, new log files are not generated. SSH connections still function, however. VSI recommends that you rename the SSHD.LOG as *version;1* to fix the problem. VSI also recommends that files be removed regularly, to allow space for new file creation.

## 17. SSH Port Forwarding and OpenVMS Captive Users

*Version 10.5*

SSH implements a user group, known internally by SSH, which designates the users of captive accounts. This group, IP\$SSH\_CAPTIVE\_USERS, gives the system administrator a method by which to specify captive users in various aspects of SSH configuration without requiring definition and management of OpenVMS rights identifiers. Additionally, the supplied SSH configuration template, SSHD2\_CONFIG.TEMPLATE, disables port forwarding for captive users by default. To enable the SSH port forwarding feature for captive users, remove the line “DenyTcpForwardingForGroups” from the SSHD2\_CONFIG.CONF, which can be found in SYS\$SPECIFIC:[IP.CONFIG.SSH2]

## 18. SSH UNIX-style Options Not Available

*Version 10.5*

SSH does not offer the Unix-style options -h and -v, which display help and version information respectively. Use the /HELP and /VERSION qualifiers instead.

```
$ SSH /HELP
$ SSH /VERSION
```

## 19. VSI TCP/IP V10.5 and TCP/IP Services Compatibility Issues and Differences in Behavior

*Version 10.5*

### Compatibility Issues

VSI is investigating compatibility issues between the current TCP/IP Services network stack offering and VSI's TCP/IP V10.5. We encourage customers to provide feedback on the impact of the issues noted below and notify us of any others that are encountered. Please return feedback by sending email to VSI at [support@vmssoftware.com](mailto:support@vmssoftware.com).

1. The socket option SO\_SHARE is not implemented in VSI TCP/IP V10.5.
2. The TCP/IP Services TELNET API is not implemented in VSI TCP/IP for OpenVMS V10.5.

3. The API `if_indexname()`, which retrieves information about the network interfaces configured in the system, does not include `lo0` in the list of interfaces it returns.
4. When features are available via both the standard socket interface and `QIO$`, VSI recommends use of the standard socket interface. For example, use of `QIO$` in VSI TCP/IP V10.5 might result in status return values that indicate failure; these values may not match the values returned by TCP/IP Services.
5. An HPE TCP/IP Services FTP client issuing a `get` of an index file from a VSI TCP/IP FTP server hangs. This is due to HPE TCP/IP Services FTP client and VSI TCP/IP FTP server identifying each other as VMS through the command `SITE VMS`. To work around this issue, enter the following command prior to issuing the `get` command:

```
FTP> disable vms
```

### Differences in Behavior

VSI has observed the following differences in behavior between VSI TCP/IP V10.5 and TCP/IP Services.

1. **COPY/FTP Exhibits Incorrect Behavior When Remote Files are Copied Using Wildcard File Specification.** When you use COPY/FTP to copy files from systems running TCP/IP Services and use a wildcard in the source file specification, the output files on the local system will have exactly the same version number as the file on the remote system. Here is an example of a command that results in incorrect behavior:

```
copy/ftp node"user password>::login.*;* [] ...
```

If files with the same name exist on the local system, the output files might have lower version numbers than the files on the local system, or they could collide with the existing file version(s).

2. **COPY/FTP of Remote File to Wildcard Local File Specification Fails.** When you use COPY/FTP to copy a remote file to a local destination and use a wildcard file specification for the output file, the copy will fail. Here is an example of a command that will fail:

```
copy/ftp node"user password>::login.com *
```

To work around this issue, specify the target directory without the wildcard file specification, as shown in this example:

```
copy/ftp node"user password>::login.com []
```

3. **COPY/FTP May Change File Attributes When Copying Between VSI TCP/IP V10.5 and TCP/IP Services.** When copying files between systems running VSI TCP/IP V10.5 and those running HPE or VSI TCP/IP Services, the following file attributes may change: file organization, record attributes, and record format. To work around this issue, use FTP directly, rather than COPY/FTP, and transfer a backup save set containing the files in image mode.

4. **COPY/FTP Source File Search List Logical Interaction.** When using COPY/FTP from a system running HPE or VSI TCP/IP Services, more than one file will be copied if the source file specification references a search list logical (like SYS\$SYSROOT) and copies of the desired file exist in more than one place in the search list.

5. **COPY/FTP Syntax Restriction** COPY/FTP improperly handles several forms of directory specifications, such as unmerged rooted directory specifications and directory specifications delimited by angle brackets < >. These are shown in the following examples:

```
COPY/FTP [ROOT.] [DIRECTORY]FOO.TXT host"username password"::
```

```
COPY/FTP <DIRECTORY>FOO.TXT hostname"username password"::
```

To work around the issue in the first example, remove the characters .][ from the directory specification. In the second example, replace the angle brackets < > with brackets [ ].

6. **COPY/FTP Wildcard Input Files Are Copied to The Output Default Directory.** When a wildcard (\*) is used to specify the input files to the command COPY/FTP, the specified destination directory is ignored and the files are copied to the default directory instead. In the case of a local destination this will be the current default directory for the user. In the case of a remote destination, this will be the login default for the target user account (unless changed by login.com on the target host).

## Layered Products and Tools Release Notes

This section contains release notes for layered products and tools that interact with VSI TCP/IP Version 10.5.

1. **Common Internet File System (CIFS):** The currently released version of VSI CIFS does not recognize VSI TCP/IP V10.5 as a supported network stack. In order to run VSI CIFS with VSI TCP/IP V10.5, you must update the CIFS startup procedures. Download the kit VSI-I64VMS-SAMBA-V0102-ECO1C-2.ZIPEXE using SFTP (required) from this location:

SFTP Server: [vsift.vmssoftware.com](https://vsift.vmssoftware.com) (104.207.199.163)

Username: ECOKITS

Password: VS1isVMS!

Directory: i64opensource

Filename: VSI-I64VMS-SAMBA-V0102-ECO1C-2.ZIPEXE

Unpack the kit on an OpenVMS host using the following command:

```
$ RUN VSI-I64VMS-SAMBA-V0102-ECO1C-2.ZIPEXE
```

The kit VSI-I64VMS-SAMBA-V0102-ECO1C-2.ZIPEXE contains VSI-I64VMS-SAMBA-V0102-ECO1C-2.RELEASE\_NOTES (containing installation instructions) and the new CIFS startup files that recognize VSI TCP/IP V10.5.

### Note:

- If you previously installed CIFS patch PS2\_14, you may apply VSI-I64VMS-SAMBA-V0102-ECO1C-2.ZIPEXE on top of PS2\_14.
  - If you *have not yet* installed CIFS patch PS2\_14 but intend to do so, install PS2\_14 *before* installing VSI-I64VMS-SAMBA-V0102-ECO1C-2.ZIPEXE.
2. **HPE Insight Management Agents:** Support for HPE Insight Management Agents requires images found in TCP/IP Services that are not included in VSI TCP/IP at this time.
  3. **Other Networking Products:** The network state and environment used by OpenVMS has several components that may overlap if multiple network products are installed on your system. After installing VSI TCP/IP V10.5, removing or installing another network product can render certain portions of the VSI TCP/IP network environment unusable. For example, removing or installing the TCP/IP Services product or Process Software's MultiNet product can result in these symptoms:
    - **Network commands in DCL may no longer function:** Various network commands that are shared between products may be deleted or changed within the DCLTABLES on the system. These commands include: FINGER, FTP, RCP, RLOGIN, RPCGEN, RSHELL, SCP2, SFTP2, SSH, SSH2, and TELNET.
    - **Configuration information for Clusters over IP via IPCI may be deleted:** If you use IPCI to enable clustering over IP for your VMScluster, the cluster's network configuration can be lost when another product is installed or deleted. As a result the node will be unable to boot into the cluster since it cannot find the other cluster members via IP.

To avoid these symptoms, VSI provides a procedure to restore the VSI TCP/IP state that is overlapped and potentially removed. After installing or removing another network product, use the following command to restore the environment so that it will continue to use VSI TCP/IP:

```
$ @SYS$MANAGER:IP$FIX_VSI_TCPIP
```

This will restore the VSI TCP/IP network commands and IPCI configuration information. VSI strongly recommends that you invoke this procedure immediately after installing or removing another network product if you want to continue using VSI TCP/IP.

**Note:** Failure to run this procedure can result in a boot hang at some later time if you use IPCI for clustering over IP.

4. **TCP/IP Services Fails to Start After Installation of VSI TCP/IP V10.5:** If you try to start TCP/IP Services by running TCPIP\$STARTUP after you have installed VSI TCP/IP V10.5, you will see the following error message:

```
$ @SYS$STARTUP:TCPIP$STARTUP
%TCPIP-E-STARTFAIL, failed to start TCP/IP Services
-TCP/IP-E-NOLICENSE, license check failed
```

To resume use of TCP/IP Services after you have installed VSI TCP/IP V10.5, run the procedure @SYS\$MANAGER:IP\$SET\_STACK to switch stacks. You must also use IP\$STARTUP at boot time instead of using TCPIP\$STARTUP. For additional information, see the *VSI TCP/IP Installation and Quick Start Guide*.

5. **VSI DCE Compatibility With VSI TCP/IP V10.5.** In order to run VSI DCE with VSI TCP/IP V10.5, you must acquire VSI DCE Version 3.2D. Previous versions of VSI DCE V3.2 do not recognize VSI TCP/IP V10.5 as a valid network stack.

To request the kit, VSI direct support customers should send email to [Support@vmssoftware.com](mailto:Support@vmssoftware.com) and reference their VSI support contract number in the email. HPE support customers should access the HPE support site or contact their HPE support representative to request the kit.

6. **VSI T4 INET Collection Call Fails With VSI TCP/IP:** The VSI T4 tool's INET collection fails when used with VSI TCP/IP V10.5. As a result, Internet data is not collected. This will be addressed in a future update to VSI T4.
7. **VSI TDC (The Data Collector) INET Collection Fails with VSI TCP/IP:** The Data Collector (TDC) INET collection fails when used with VSI TCP/IP V10.5. As a result, Internet data is not collected. This will be addressed in a future update to VSI TDC.
8. **VSI WBEM Services (WBEMCIM) Installation Requirement:** Installation of VSI WBEM Services (WBEMCIM) V3.0-C180108 for VSI OpenVMS Integrity Servers is required for compatibility with VSI TCP/IP V10.5. VSI highly recommends that you install the WBEMCIM kit prior to installing VSI TCP/IP V10.5.

If WBEM Services V3.0-C180108 is not installed, the following messages are displayed by the WBEM services configuration, startup, and shutdown procedures.

```
LCKHVN>> @sys$startup:wbem_services$startup
%SYSTEM-F-ABORT, abort
%RUN-S-PROC_ID, identification of created process is 23800460
%SYSTEM-F-ABORT, abort
%WBEMCIM-I-SERVERWAIT, Waiting for CIMServer to start. 180 seconds
remaining...
%SYSTEM-F-ABORT, abort
%WBEMCIM-I-SERVERWAIT, Waiting for CIMServer to start. 170 seconds remaining...
```

VSI direct support customers can send email to [L1-support@vmssoftware.com](mailto:L1-support@vmssoftware.com) and obtain access to the kit. Please reference your VSI support contract number in the email. HPE direct support customers should access the kit via the HPE support site.



## Appendix A: Considerations When Configuring VSI TCP/IP in Environments that Include OpenVMS Cluster Over Internet Protocol (IP)

VSI TCP/IP V10.5 is fully supported in OpenVMS cluster configurations, which can take one of two forms:

- A traditional cluster that communicates using the LAN interconnect
- A cluster that communicates using the TCP/IP stack, known as OpenVMS Cluster over IP or IPCI (IP Cluster Interconnect)

OpenVMS Cluster over IP provides the ability to form a cluster beyond a single LAN or VLAN segment using the industry standard Internet Protocol (IP), and also provides improved disaster tolerant capability.

The OpenVMS Cluster over IP solution is an integration of the following functionality:

- PEDRIVER support for User Datagram Protocol (UDP)
- TCP/IP boot time loading and initialization

For more information about configuring and using OpenVMS Cluster over IP, please refer to the *OpenVMS Cluster Systems* manual.

### 1. Before Installing VSI TCP/IP V10.5 in a Cluster over IP Environment

Before beginning a VSI TCP/IP installation that involves Cluster over IP, please review the *VSI TCP/IP V10.5 Installation and Quick Start Guide* for basic information about installing and modifying your VSI TCP/IP V10.5 stack. However, when you are ready to configure VSI TCP/IP with Cluster over IP, refer to the information in this appendix.

Cluster Over IP requires a network interface referred to as the IPCI (IP Cluster Interconnect) channel. This is the designated channel for cluster communications between the cluster's systems.

**Restriction:** When using Cluster Over IP with VSI TCP/IP V10.5, IPCI is limited to a single interface; this interface must be SE0. Also, only standard frames are used, regardless of the setting you choose for SE0.

These problems may be addressed in a future version of VSI TCP/IP.

Additionally, the VSI TCP/IP interface configuration utility will take note of the Cluster Over IP state of the system you are on, and will ensure that the IPCI channel is only associated with the SE0 network device. It does this by validating the SE0 network device against the device defined within `SYSS$SYSTEM:TCPIP$CLUSTER.DAT`. If there is a mismatch, the VSI TCP/IP configuration utility will issue an error, and fail to make any requested changes to the network interface.

For example, your system may have EIF0 previously designated as the IPCI channel in `TCPIP$CLUSTER.DAT`, but you want to use EIF0 for your VSI TCP/IP Cluster over IP channel:

```
$ IP SHOW/INTERFACE SE0
Device se0: flags=8863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST,D2>
          VMS Device = EIG0
          IP Address = 10.10.110.3
          No common links defined
$
$ IP CONFIGURE/INTERFACE
NET-CONFIG> MODIFY SE0
[Modifying configuration entry for device "SE0"]
VMS Device [EIG0]: EIF0
Link Level Encapsulation Mode [ETHERNET]:
BSD Trailer Encapsulation: [DISABLED]
IP Address [10.10.110.3]:
IP SubNet Mask [255.255.254.0]:
Non-Standard IP Broadcast Address [10.10.111.255]: none
DHCP CLIENT [DISABLED]:
Jumbo Frames [DISABLED]:
IPv6 on this interface [DISABLED]:
[se0 (Shared VMS Ethernet/FDDI): Csr=NONE, Flags=%X0]
NET-CONFIG>SAVE
ERROR: SE0 is using a different interface (EIF0) for IP Cluster (EIG)

This network configuration FAILED the sanity check.
$
```

Last, if the system was previously configured for Cluster over IP under HPE TCP/IP Services or Process Software's Multinet product, VSI TCP/IP will inherit the Cluster over IP configuration, thus establishing defaults for the IPCI channel configuration. You should continue with this configuration since it involves updating configuration data across the cluster. However, it is possible to change the IPCI network device on any given system if circumstances require.

## 2. Installing and Configuring VSI TCP/IP V10.5 with Cluster over IP

When you are ready to install VSI TCP/IP V10.5, choose one of the following options depending on the network stack you are currently using, and whether you want to configure or remove Cluster over IP.

**OPTION 1: You are running VSI TCP/IP V10.5 with a traditional cluster and want to switch to an IPCI cluster.**

After you have performed the initial interface configuration and are ready to reboot, follow these steps to configure OpenVMS Cluster over IP with VSI TCP/IP V10.5:

1. Configure IPCI by executing the following command procedure:

```
$ @SYS$MANAGER:IP$CONFIGURE_IPCI
```

Choose the appropriate menu options, and enable IPCI on the SE0 network interface.

**Reminder:** This step creates the files TCPIP\$CLUSTER.DAT and PE\$IP\_CONFIG.DAT in SYS\$SYSTEM. The procedure also modifies MODPARAMS.DAT to enable Cluster over IP, and moves certain VSI TCP/IP image files into place, saving any pre-existing versions that exist.

2. Run the AUTOGEN Utility by entering this command:

```
$ @SYS$UPDATE:AUTOGEN GETDATA REBOOT
```

Reboot the system to save the changes. See the *OpenVMS System Management Utilities Reference Manual* for more information about AUTOGEN.

**OPTION 2: You are running TCP/IP Services V5.7 or Process Software's MultiNet V5.5, on a Cluster over IP cluster. You want to install, and switch to, VSI TCP/IP V10.5.**

Follow these steps to install VSI TCP/IP V10.5 and enable it as the new network stack:

1. Install VSI TCP/IP V10.5 as described in the *VSI TCP/IP V10.5 Installation and Quick Start Guide*. However, when you are ready to configure VSI TCP/IP with Cluster over IP, follow these steps.
2. Configure the first network interface during installation, or afterwards, with the command @IP\$:CONFIGURE.

**Note:** VSI TCP/IP requires the device used by IPCI to be configured first, as the SE0 interface.

- If you previously configured a network device for IPCI use under another stack, you must now configure that same device to be the SE0 interface for VSI TCP/IP.
- If you previously configured a device for IPCI use under another stack but want to configure a different network device as VSI TCP/IP's SE0 interface, you will receive a warning (shown in *Examples*).

3. Edit your system's startup procedure, locate your existing network stack's startup procedure and remove it. Replace it with this command:

```
$ @SYS$STARTUP:IP$STARTUP
```

4. Run the following procedure. When asked to choose from the list of network products, select VSI TCP/IP.

```
$ @SYS$MANAGER:IP$SET_STACK
```

5. To run VSI TCP/IP, reboot the system.

### **OPTION 3: You are running VSI TCP/IP V10.5 with Cluster over IP cluster and want to switch to a traditional cluster.**

Follow these steps to change the configuration to a traditional cluster:

1. Configure IPCI with this command:

```
$ @SYS$MANAGER:IP$CONFIGURE_IPCI
```

After you enter the command, the following system dialog will be displayed:

```
VSI TCP/IP Cluster-over-IP (IPCI) Configuration
```

```
IPCI status
```

```
    Enabled in MODPARAMS:  yes
    Enabled on running system:  yes
    System configured:  yes
    Interface enabled:  yes
```

```
System configuration
```

```
    multicast_address:  239.242.4.65
                        ttl:  32
    udp_port:  49152
```

```
Interface configuration
```

```
    enabled:  EWA0
```

```
Do you want to disable IPCI? [NO] YES
```

```
The configuration procedure has completed successfully.
```

```
BUMMDG has been disabled for IP communications.
Please run AUTOGEN to reboot BUMMDG:
```

```
$ @SYS$UPDATE:AUTOGEN GETDATA REBOOT
```

2. Run the AUTOGEN Utility by entering this command:

```
$ @SYS$UPDATE:AUTOGEN GETDATA REBOOT
```

Reboot the system to save the changes. See the *OpenVMS System Management Utilities Reference Manual* for more information about AUTOGEN.

### 3. Examples of IPCI Configuration Scenarios

**Example 1.** You have either decided to install VSI TCP/IP and switch the cluster configuration to Cluster over IP, or to continue using the pre-existing cluster configuration. In either case, you want to make VSI TCP/IP the default stack.

Install VSI TCP/IP V10.5 as described in the *VSI TCP/IP V10.5 Installation and Quick Start Guide*. However, when you are ready to configure VSI TCP/IP with Cluster over IP, follow these steps.

1. Execute IP\$CONFIGURE to create the initial VSI TCP/IP configuration, including the SEO interface.
2. Configure any additional network interfaces with the command IP CONFIGURE/INTERFACE.

```
$ @ip$:ip$configure_ipci
```

```
VSI TCP/IP Cluster-over-IP (IPCI) Configuration
```

**IPCI status**

```
    Enabled in MODPARAMS:  no
    Enabled on running system:  no
    System configured:  no
    Interface enabled:  no
```

**System configuration**

```
none
```

**Interface configuration**

```
enabled: none
```

```
Do you want to enable IPCI? [YES] YES
```

```
EMILY has been enabled for IP communications.
Please run AUTOGEN to reboot EMILY:
```

```
$ @SYS$UPDATE:AUTOGEN GETDATA REBOOT
```

```
Do you want to create your system configuration? [YES] YES
```

```
UDP port number to be used for Cluster Communication over IP[49152]? 49737
```

```
Enable IP multicast for cluster communication(Y/N) [Y]? NO
```

```
Do you want to enter unicast address(es) (Y/N) [Y]? YES
```

```
What is the unicast address[Press [RETURN] to end the list]? 10.10.110.3
```

```
What is the unicast address[Press [RETURN] to end the list]? 10.10.40.138
```

```
What is the unicast address[Press [RETURN] to end the list]? 10.10.110.4
```

```
What is the unicast address[Press [RETURN] to end the list]? 10.10.110.5
```

```
What is the unicast address[Press [RETURN] to end the list]? 10.10.110.6
```

```
What is the unicast address[Press [RETURN] to end the list]?
```

Do you want to create your interface configuration? [YES] **YES**

VMS Device	Link	Speed	TCP/IP Interface	Address	Subnet	IPCI
EWA0	Up	10000				no
EWB0	Up	10000				no
EWCO	Up	1000	SE1	10.10.110.16	255.255.254.0	no
EWDO	Up	1000	SE2	10.10.110.26	255.255.254.0	no
EIA0	Up	1000	SE0	10.10.110.6	255.255.254.0	no
EIB0	Up	1000	SE3	10.10.110.36	255.255.254.0	no
EICO	Down	1000				no
EIDO	Down	1000				no
EBA0	Down	10000				no
EBB0	Down	10000				no
EWEO	Up	10000				no
EWFO	Up	10000				no
EWGO	Up	1000	SE4	10.10.110.46	255.255.254.0	no
EWHO	Up	1000	PD0	10.10.110.8	255.255.254.0	no

Select device to configure or enter **NONE** [EIA0] : **EIA0**

Do you want to **enable** or **disable** IPCI on EIA0/SE0? [ENABLE] **ENABLE**

VMS Device	Link	Speed	TCP/IP Interface	Address	Subnet	IPCI
EWA0	Up	10000				no
EWB0	Up	10000				no
EWCO	Up	1000	SE1	10.10.110.16	255.255.254.0	no
EWDO	Up	1000	SE2	10.10.110.26	255.255.254.0	no
EIA0	Up	1000	SE0	10.10.110.6	255.255.254.0	yes
EIB0	Up	1000	SE3	10.10.110.36	255.255.254.0	no
EICO	Down	1000				no
EIDO	Down	1000				no
EBA0	Down	10000				no
EBB0	Down	10000				no
EWEO	Up	10000				no
EWFO	Up	10000				no
EWGO	Up	1000	SE4	10.10.110.46	255.255.254.0	no
EWHO	Up	1000	PD0	10.10.110.8	255.255.254.0	no

Select device to configure or enter **NONE** [EIA0] : **NONE**

**You must run AUTOGEN and reboot as soon as possible.**

```
$ @SYS$UPDATE:AUTOGEN GETDATA REBOOT
```

**Example 2:** You want to install VSI TCP/IP on an existing Cluster over IP system, but want to use a different network device for the IPCI channel.

Install VSI TCP/IP V10.5 as described in the *VSI TCP/IP V10.5 Installation and Quick Start Guide*. However, when you are ready to configure VSI TCP/IP with Cluster over IP, follow these steps.

1. Execute IP\$CONFIGURE to create the initial VSI TCP/IP configuration, including the SE0 interface.
2. Configure the IPCI channel and environment with this command:

```
$ @SYS$MANAGER:IP$CONFIGURE_IPCI
```

VSI TCP/IP Cluster-over-IP (IPCI) Configuration

**IPCI status**

```

Enabled in MODPARAMS: yes
Enabled on running system: yes
System configured: yes
Interface enabled: yes
  
```

**System configuration**

```

udp_port: 49737
unicast: 10.10.110.3
unicast: 10.10.40.138
unicast: 10.10.110.4
unicast: 10.10.110.5
unicast: 10.10.110.6
  
```

**Interface configuration**

```

enabled: EIA0
  
```

Do you want to disable IPCI? [NO] no

Do you want to change your system configuration? [NO] **YES**

UDP port number to be used for Cluster Communication over IP[49737]?

Enable IP multicast for cluster communication(Y/N)[Y]? **NO**

Do you want to enter unicast address(es) (Y/N)[Y]? **YES**

What is the unicast address[Press [RETURN] to end the list]? **10.10.110.3**

What is the unicast address[Press [RETURN] to end the list]? **10.10.40.138**

What is the unicast address[Press [RETURN] to end the list]? **10.10.110.4**

What is the unicast address[Press [RETURN] to end the list]? **10.10.110.5**

What is the unicast address[Press [RETURN] to end the list]? **10.10.110.6**

What is the unicast address[Press [RETURN] to end the list]?

Do you want to change your interface configuration? [NO] **YES**

VMS Device	Link	Speed	TCP/IP Interface	Address	Subnet	IPCI
EWA0	Up	10000	SE1	10.10.110.15	255.255.254.0	no
EWB0	Up	10000				no
EWCO	Up	10000				no
EWDO	Up	10000				no
EIA0	Up	1000	SE0	10.10.110.5	255.255.254.0	yes
EIB0	Up	1000				no

Select device to configure or enter **NONE** [EIA0] : **EIA0**

Do you want to **enable** or **disable** IPCI on EIA0/SE0? [ENABLE] **DISABLE**

VMS Device	Link	Speed	TCP/IP Interface	Address	Subnet	IPCI
EWA0	Up	10000	SE1	10.10.110.15	255.255.254.0	no
EWB0	Up	10000				no
EWCO	Up	10000				no
EWDO	Up	10000				no
EIA0	Up	1000	SE0	10.10.110.5	255.255.254.0	no
EIB0	Up	1000				no

Select device to configure or enter **NONE** [EIA0] : **EWA0**

Do you want to **enable** or **disable** IPCI on EWA0/SE1? [ENABLE] **ENABLE**

**The device enabled for IPCI must be SE0.**

If you want EWA0 to be enabled for IPCI, you must change interface SE0 to be EWA0 **immediately** after exiting this procedure by running IP CONFIGURE /INTERFACE.

Do you want to enable EWA0 for IPCI? [NO] **YES**

VMS Device	Link	Speed	TCP/IP Interface	Address	Subnet	IPCI
EWA0	Up	10000	SE1	10.10.110.15	255.255.254.0	yes
EWB0	Up	10000				no
EWCO	Up	10000				no
EWDO	Up	10000				no
EIA0	Up	1000	SE0	10.10.110.5	255.255.254.0	no
EIB0	Up	1000				no

Select device to configure or enter **NONE** [EIA0] : **NONE**

```
$
$ IP CONFIGURE/INTERFACE
VSI TCP/IP Network Configuration Utility
[No checking is done against the MAXIMUM configuration]
[Reading in configuration from IP$:NETWORK_DEVICES.CONFIGURATION]
NET-CONFIG>SHOW
```

Interface	Adapter	CSR Address	Flags/Vector
se0	(Shared VMS Ethernet/FDDI) -NONE-	-NONE-	-NONE-
[TCP/IP: 10.10.110.5, IP-SubNet: 255.255.254.0 (/ -1)]			
[VMS Device: EIA0, Link Level: Ethernet ]			
se1	(Shared VMS Ethernet/FDDI) -NONE-	-NONE-	-NONE-
[TCP/IP: 10.10.110.15, IP-SubNet: 255.255.254.0 (/ -1)]			
[VMS Device: EWA0, Link Level: Ethernet ]			

```
Official Host Name:          hnalor.eng.vmssoftware.com
Default IP Route:           10.10.110.1
Domain Nameservers:        10.10.124.253
                           10.10.131.250
                           10.10.101.239
Timezone:                   EST
Timezone Rules:            US/EASTERN
Load UCX $QIO driver:      TRUE
Load PWIP (Pathworks) driver: TRUE
```

```
NET-CONFIG>MODIFY SE0
[Modifying configuration entry for device "se0"]
VMS Device [EIA0]: EWA0
Link Level Encapsulation Mode [ETHERNET]:
BSD Trailer Encapsulation: [DISABLED]
IP Address [10.10.110.5]: 10.10.110.15
IP SubNet Mask [255.255.254.0]:
Non-Standard IP Broadcast Address [10.10.111.255]: NONE
DHCP CLIENT [DISABLED]:
Jumbo Frames [DISABLED]:
IPv6 on this interface [DISABLED]:
[se0 (Shared VMS Ethernet/FDDI): Csr=NONE, Flags=%X0]
```

```
NET-CONFIG>MODIFY SE1
[Modifying configuration entry for device "se1"]
VMS Device [EWA0]: EIA0
Link Level Encapsulation Mode [ETHERNET]:
BSD Trailer Encapsulation: [DISABLED]
IP Address [10.10.110.15]: 10.10.110.5
IP SubNet Mask [255.255.254.0]:
Non-Standard IP Broadcast Address [10.10.111.255]: NONE
DHCP CLIENT [DISABLED]:
Jumbo Frames [DISABLED]:
IPv6 on this interface [DISABLED]:
[se1 (Shared VMS Ethernet/FDDI): Csr=NONE, Flags=%X0]
```

```
NET-CONFIG>SHOW
```

Interface	Adapter	CSR Address	Flags/Vector
se0	(Shared VMS Ethernet/FDDI) -NONE-	-NONE-	-NONE-
[TCP/IP: 10.10.110.15, IP-SubNet: 255.255.254.0 (/ -1)]			



```
sel      [VMS Device: EWA0, Link Level: Ethernet ]
         (Shared VMS Ethernet/FDDI)           -NONE-           -NONE-           -NONE-
         [TCP/IP: 10.10.110.5, IP-SubNet: 255.255.254.0 (/ -1)]
         [VMS Device: EIA0, Link Level: Ethernet ]

Official Host Name:          hnalor.eng.vmssoftware.com
Default IP Route:           10.10.110.1
Domain Nameservers:         10.10.124.253
                             10.10.131.250
                             10.10.101.239
Timezone:                    EST
Timezone Rules:              US/EASTERN
Load UCX $QIO driver:        TRUE
Load PWIP (Pathworks) driver: TRUE
NET-CONFIG>SAVE
[Writing Startup file SYS$STARTUP:IP$SYSTARTUP.COM]
[Changes take effect after the next VSI TCP/IP reload]
NET-CONFIG>EXIT
[Writing configuration to SYS$SYSROOT:[IP.CONFIG]NETWORK_DEVICES.CONFIGURATION]
$
$ TYPE SYS$SYSTEM:TCPIP$CLUSTER.DAT
interface=SE0,EWA0,10.10.110.15,255.255.254.0
default_route=10.10.110.1
$
```

Reboot system as described in the *VSI TCP/IP V10.5 Installation and Quick Start Guide*.

## VSI TCP/IP for OpenVMS Documentation

The VSI TCP/IP for OpenVMS documentation set is comprised of the following manuals, which are provided in PDF format. VSI TCP/IP documents are not available in hardcopy (printed) format but can easily be printed from the PDF files.

**Table 2: VSI TCP/IP Documentation**

Part Number	Title	Description
DO-DVTCLR-00A	VSI TCP/IP V10.5 Cover Letter and Release Notes	This document provides an introduction to VSI TCP/IP for OpenVMS. It also includes late-breaking product and documentation release notes.
DO-DVTQSG-00A	VSI TCP/IP V10.5 Installation and Quick Start Guide	This document describes how to install and initially configure VSI TCP/IP for OpenVMS.
DO-DVTIA1-00A	VSI TCP/IP V10.5 Administrator's Guide, Volume I	This document introduces basic TCP/IP concepts and describes how to install and administrate VSI TCP/IP for OpenVMS.
DO-DVTIA2-00A	VSI TCP/IP V10.5 Administrator's Guide, Volume II	This document provides advanced configuration instructions.
DO-DVTADR-00A	VSI TCP/IP V10.5 Administrator's Reference	This reference manual describes administration commands.
DO-DVTMLD-00A	VSI TCP/IP V10.5 Messages, Logicals, and DECnet Applications	This document describes system messages, status codes, error codes, and DECnet application services.
DO-DVTPRG-00A	VSI TCP/IP V10.5 Programmer's Reference	This document provides a programming tutorial, examples, and in-depth information on routines.
DO-DVTSPQ-00A	VSI TCP/IP V10.5 Software Product Description (SPD)	This document describes VSI TCP/IP for OpenVMS features and capabilities, as well as licensing and ordering information.
DO-DVTUSG-00A	VSI TCP/IP V10.5 User's Guide	This document describes VSI TCP/IP for OpenVMS user commands. It includes easy-to-follow instructions for beginning users and command pages for advanced users.

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