

# Verix eVo Communication Server

## *Instantiation Guide*



Verix eVo Communication Server Instantiation Guide  
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The Communication Server is a client/server solution, where the Communication Server task is responsible for all the communication that takes place from the session layer and the layers that are below the session layer. This guide describes the configuration of the Verix eVo Communication Server.

## Target Audience

This document is intended for software solution providers of VeriFone.

## Document Organization

This document is organized as follows:

**Table 1 Document Organization**

Chapter	Description
Chapter 1, Overview	Provides information on media supported by Verix eVo terminals, and lists the steps required to download Communication Server.
Chapter 2, Configuring the Terminals	Lists and describes the configuration parameters for Verix eVo.

## Manual Conventions

This section provides a quick reference to conventions used in this manual.

The following conventions help the reader distinguish between different types of information:

- The `courier` typeface is used for code entries, filenames and extensions, and anything that requires typing at the DOS prompt or from the terminal keypad.
- The *italic* typeface indicates book title or emphasis.
- Text in [blue](#) indicates terms that are cross-referenced. When the pointer is placed over these references the pointer changes to the finger pointer, indicating a link. Click on the link to view the topic.
- `ref[n]` indicates the *n*<sup>th</sup> document listed in the References section.

### NOTE



Note points out interesting and useful information.

### CAUTION



Caution points out potential programming problems.

The various acronyms and abbreviations used throughout this manual are listed in the table below.

**Table 2**      **Acronyms and Definitions**

Acronym	Definition
APN	Access Point Name
DNS	Domain Name System/Server/Service
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
NCP	Network Control Panel
PPP	Point to Point Protocol
RTT	Round Trip Time
SIM	Subscriber Identity Module
SSL	Secure Socket Layer
TCP/IP	Transmission Control Protocol/Internet Protocol
UI	User Interface

## **Related Documentation**

To learn more about the Verix eVo Communication Server Solutions, refer to the following set of documents:

- Verix eVo Volume I: Operating System Programmers Manual, VPN - DOC00301.
- Verix eVo Volume II Operating System and Communication Programmers Guide, VPN - DOC00302.
- Verix eVo Volume III: Operating System Programming Tools Reference Manual, VPN - DOC00304.
- Verix eVo Porting Guide, VPN - DOC00305.
- Verix eVo Multi-App Conductor Programmers Guide, VPN - DOC00306.
- Verix eVo Development Suite Getting Started Guide, VPN - DOC00309.



### Overview

The Communication Server is a client/server solution, where a Communication Server task is responsible for all the communication that takes place from the session layer and the layers that are below session layer.

In the Verix eVo platform, the network connection management becomes the responsibility of the CommEngine (CE). VCS registers to CE to receive and manage network notifications/events which enables VCS to do necessary actions based on the received events. VCS has no user interface (UI) and it simply runs as a background application. Network configuration can be done using the Network Control Panel (NCP) application.

#### **Media Switching**

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VCS Media switching can somehow be translated in Verix eVo as stopping and starting of specific network interfaces (NWIF). Verix eVo can have multiple NWIF running at the same time and with each NWIF being managed independently. When VCS media switch is requested, it does not necessarily need to stop the currently used media/NWIF unless restricted due to hardware exclusivity issue. An example of this on Vx570; it can support and start Ethernet and LL NWIF at the same time but will not be possible for Vx610 to have GPRS and LL due to hardware interference issue. NWIF can be started using NCP or thru a run time Media Switch request on VCS.

Directory Structure

The directory structure under which the files of each instantiation are available is as follows.

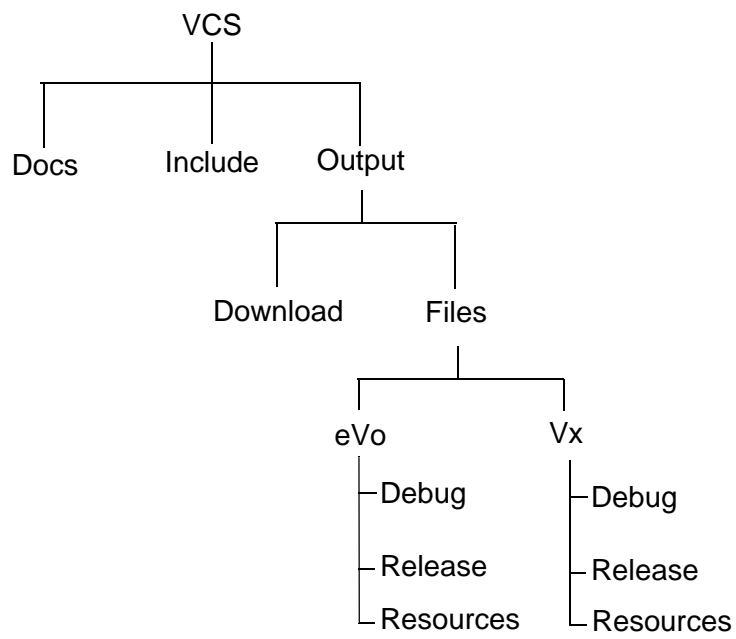


Figure 1 Directory structure for Verix eVo Communication Server

Directory Contents

The following table lists the contents of the directories required to download the Communication Server.

Table 3 Contents of the Directories

Directory	Contents
Download	DlVCS.bat batch file and the .dld files required to download Communication Server to the terminal.
Debug	The debug version of the Communication Server binary that supports both TCPIP and SSL communication.
eVo	VCS binaries compiled and linked using Verix eVo DTK
Release	The release version of the Communication Server binary that supports both TCPIP and SSL communication.
Resources	The resource files required.
Vx	VCS binaries compiled and linked using Verix V DTK



## Downloading Communication Server

To download Communication Server:

- 1 Switch to the default download directory for VCS:  
`<VCSDirectory>/output/download`
- 2 Run the `DlVCS.bat` file using the following options:

```
dlVCS.bat <binary type> [Platform] [SignFile]
```

### Parameters

<binary type>:	D or d - for Debug version
	R or r - for Release version
[Platform]	(Optional)
	E or e - for Verix eVo applications (Default)
	V or v - for Verix V applications
[SignFile]	(Optional)
	P or p - p7s file signed using VCS developer's production certificate (Default for Verix eVoplatform)
	D or d - p7s file signed using default certificate (Default for Verix V platform)

## Communication Server UI

The existing VCS menu contains information and options for network configuration, TCP/IP/SSL download, media switching, and Ping for network diagnostics. Most of VCS menu/options are also present in NCP.

The table below contains the VCS menu and the corresponding NCP menu which contains the same functionality.

**Table 4 VCS and NCP Menu Comparison**

VCS Menu	NCP Menu	Comparison / Description
Setup	Setup -> Communication Technology and Setup -> Device Drivers	<p>VCS Setup menu, depending on the media to be used, contains options to set NW configurations such IP, Subnet, Gateway and DNS IP addresses. It also has min/max TX timeout and max TX retry options. Once modified and saved, terminal will restart to reflect its changes on the next connection.</p> <p>NCP also have NW configuration options/setting except for the timeouts which can be set using config variables. Once modified, no terminal restart is needed, but it is necessary to manually restart the NWIF thru <b>NW Maintenance</b> menu to reflect the changes.</p> <p><b>Note:</b> VCS and NCP NW configurations vary depending on the media/NWIF supported by the terminal.</p>
Download Setup	Tools -> Download	<p>Both VCS and NCP has an option to set GID, Full/Partial, Server IP, and Port No. under this menu.</p> <p>In addition to these settings, NCP included the option to select TCP or SSL DL, to set Port No., App ID, and Term ID. App ID and Term ID in this menu corresponds to *ZA and *ZT in environment variable which is used by VCS.</p> <p>Once settings are entered in NCP, download can be started under the same menu. While VCS needs to select <b>TCP Download</b> or <b>SSL Download</b> menu to start the download process.</p>
TCP Download	Tools -> Download	<p>VCS menu to start TCP download.</p> <p><i>See NCP Run -&gt;Download details above.</i></p>
SSL Download	Tools -> Download	<p>VCS menu to start TCP download.</p> <p><i>See NCP Run -&gt;Download details above.</i></p>

**Table 4 VCS and NCP Menu Comparison**

VCS Menu	NCP Menu	Comparison / Description
IP Status	Terminal Info -> IP Addresses Status	This menu shows IP address information of the current connection. This shows the IP address, Subnet Mask, Gateway and DNS server addresses.  If applicable, NCP also displays the DHCP lease start and end time.
Ping	Tools -> Diagnostics -> Ping IP Address	The main purpose of this menu is to check if the terminal is connected to a network.  NCP has an option for single or continuous ping (press Cancel to stop continuous ping.)
Media Switch	Tools -> Network Maintenance	VCS shows the available media that it switched to, once a new media is selected, terminal will restart.  NCP's network maintenance lists all available Network Interfaces (NWIF). Users can Start, Stop and Restart the specific NWIF
About	Terminal Info -> Versions	VCS Menu that shows the version number of VCS and version of the library linked with it such as TCP/IP, UCL, IPDL and VMAC version.  NCP Menu that shows the version numbers of NCP, CE, CEIF library, DDI Drivers, eVo Log library and other eVo components.

For more information, please refer to the *Verix eVo Volume II Operating System and Communication Programmers Guide (DOC00302)*.

## Running in Stand Alone Mode

Communication Server is not advised to run in a single application mode (non-VMAC) environment. No user interface will appear in the terminal for this mode. To download via TCP/IP or SSL protocol, use the Network Control Panel's download feature.

## Guidelines

Applications can request for the network connection status by sending VCS\_EVT\_STATUS\_REQ event to the Communication Server.





# Configuring Media Parameters in Config.sys

This chapter lists and describes the steps to configure the common and media specific parameters through `Config.sys` file.

## Configuration of Common Parameters in Config.sys

The following table lists the parameters in the `Config.sys` file. These parameters are common across different media.

**Table 5 Common Param IDs - Configured only in Config.sys**

Configuration Through					
Config Param ID	Description	UI	Environment Variable	Mandatory (Yes/No)	Default Value
*VCSCOMBO	<p>Specifies the media in which the terminal starts.</p> <p>Value is:</p> <ul style="list-style-type: none"> <li>0 = Landline with PPP</li> <li>1 = TCP media (GPRS/Ethernet/WiFi/CDMA)</li> <li>2 = Landline without PPP</li> <li>3 = GSM with PPP</li> <li>4 = GSM without PPP</li> </ul> <p><b>Note:</b> Landline is only supported in Vx670.</p>	No	Yes	No	1

### IP Download Specific Config Entries

*ZA	Specifies the application name, which is configured in VeriCentre that needs to be downloaded to the terminal.	No	Yes	Yes	Not set
*ZT	Specifies the terminal ID that is configured in VeriCentre.	No	Yes	Yes	Not set

**Note:** For UI initiated downloads \*ZA and \*ZT should be in the GID where application will be downloaded.

**Table 5 Common Param IDs - Configured only in Config.sys**

Config Param ID	Description	UI	Configuration Through			Default Value
			Environment Variable	Mandatory (Yes/No)		
#VCSDLTCPTIMEOUT	Specifies the TCP time-out value of OSDL. It is the time taken by the Communication Server to receive the complete write- packet from VeriCentre.	No	Yes	No		Not set by the Communication Server.
#VCSLENQTIMEOUT	Specifies the ENQ time-out value (IPDL_ENQTIMEOUT) of OSDL. It is the time taken by the Communication Server to receive the ENQ packet from the VeriCentre after the socket connect is performed successfully.	No	Yes	No		Not set by the Communication Server.
VCSDEFAULTPOLICY	Default SSL validation policy to be used by Communication Server if the field VCS_FLD_CONN_SSLOPOLICY is not specified.	No	Yes	No		2
VCSSSLCERTGID	GID where SSL-related files are stored.	No	Yes	No		15
VCSCLIENTCERT	Default client certificate file path: <ul style="list-style-type: none"> <li>• must be prefixed with F: if the file is in the FLASH directory.</li> <li>• file must either be in PEM or P12 format.</li> <li>• client certificate to be used during Communication Server SSL download operations.</li> </ul>	No	Yes	No		Not Set

**Table 5 Common Param IDs - Configured only in Config.sys**

Configuration Through					
Config Param ID	Description	UI	Environment Variable	Mandatory (Yes/No)	Default Value
VCSCCLIENTKEY	Default private key file path: <ul style="list-style-type: none"><li>• must be prefixed with F: if the file is in the FLASH directory.</li><li>• private key for default client certificate in PEM format.</li></ul>	No	Yes	No	Not Set
VCSPVTKEYPWD	Default private key password path: <ul style="list-style-type: none"><li>• must be prefixed with F: if the file is in the FLASH directory.</li><li>• password for default client certificate in P12 format.</li></ul>	No	Yes	No	Not Set
VCSDEFAULTCALIST	Default CA list file path: <ul style="list-style-type: none"><li>• must be prefixed with F: if the file is in the FLASH directory.</li><li>• file must be in PEM format.</li><li>• required while using the following SSL validation policies:<ul style="list-style-type: none"><li>• VCS_SSL_POLICY_SELF_SIGNED</li><li>• VCS_SSL_POLICY_DEFAULT_CA</li><li>• VCS_SSL_POLICY_DEFAULT_CRL</li></ul></li></ul>	No	Yes	No	Not Set

**Table 5 Common Param IDs - Configured only in Config.sys**

Config Param ID	Description	Configuration Through				Default Value
		UI	Environment Variable	Mandatory (Yes/No)		
VCSDEFAULTCRL	CRL file path: <ul style="list-style-type: none"> <li>• must be prefixed with <b>F</b>: if the file is in the FLASH directory.</li> <li>• required only while using the VCS_SSL_POLICY_DEFAULT_CRL SSL validation policy.</li> </ul>	No	Yes	No		Not Set
VCSSSLCERTDRIVE	Specifies the drive used for loading the certificates. This is required only while using VCS_SSL_POLICY_DEFAULT_CA_LIST validation policy. This field should be in GID1 and the value of this field can be set to either "i" (RAM) or "f" (flash) depending on the drive in which the certificates are loaded.	No	Yes	No		"i" (RAM)



Table 6 lists the parameters in the Config.sys file that are common across different media.

**Table 6 Common Param IDs - Configured only in Config.sys**

Configuration Through					
Config Param ID	Description	UI	Environment Variable	Mandatory (Yes/No)	Default Value
VCSSSLCERTGID	Directory path for CA list files: <ul style="list-style-type: none"> <li>must be in the format of [F:][GID/]</li> <li>required only while using the VCS_SSL_POLICY_DEFAULT_CA_LIST SSL validation policy.</li> </ul>	No	Yes	No	/
VCSCIENTCERT	Default client certificate file path to be used for Communication Server SSL download: <ul style="list-style-type: none"> <li>must be in the format of [F:][GID/]filename.ext</li> <li>file must either be in PEM or P12 encoding.</li> </ul>	No	Yes	No	Not Set
VCSCIENTKEY	Default private key file path: <ul style="list-style-type: none"> <li>must be in the format of [F:][GID/]filename.ext</li> <li>private key for default client certificate in PEM format.</li> </ul>	No	Yes	No	Not Set
VCSPVTKEYPWD	Private key password for default client certificate must be in P12 format. Lowercase letters of the password should be enclosed between /* and */ characters.	No	Yes	No	Not Set

Configuration Through					
Config Param ID	Description	UI	Environment Variable	Mandatory (Yes/No)	Default Value
VCSDEFAULTCALIST	<p>Default CA list file path:</p> <ul style="list-style-type: none"> <li>• must be in the format of [F:][GID/]filename.ext</li> <li>• file must be in PEM format.</li> <li>• required while using the following SSL validation policies: <ul style="list-style-type: none"> <li>• VCS_SSL_POLICY_SELF_SIGNED</li> <li>• VCS_SSL_POLICY_DEFAULT_CA</li> <li>• VCS_SSL_POLICY_DEFAULT_CRL</li> </ul> </li> </ul>	No	Yes	No	Not Set
VCSDEFAULTCRL	<ul style="list-style-type: none"> <li>• CRL file path: <ul style="list-style-type: none"> <li>• must be in the format of [F:][GID/]filename.ext</li> <li>• required only while using the VCS_SSL_POLICY_DEFAULT_CRL SSL validation policy.</li> </ul> </li> <li>• Each CA certificate contained in the file specified through VCSDEFAULTCALIST must have a corresponding CRL within this file.</li> </ul>	No	Yes	No	Not Set

## Configurable Parameters for Performance Tuning

The following table lists the parameters that can be configured to tune the Communication Server's performance. These are fine-tuned to suit the environment where the Communication Server is running. The values listed in the table for the instantiations are the default values.



**CAUTION** The values of the parameters listed in [Table 7](#) are the default values. Do not change these values unless you are aware of the effects. Any change can affect the performance of the Communication Server.

**Table 7** Parameters that can be used for Performance Tuning

Parameter	Description	Applicable Media	Values
VCSTCPMINTXTO	Specifies the minimum time-out value (in milliseconds) for re-transmissions.	/Ethernet/WIFI/ GPRS/CDMA/ GSM/Landline	Not set
VCSTCPMAXTXTO	Specifies the maximum time-out value (in milliseconds) for re-transmissions.	/Ethernet/WIFI/ GPRS/CDMA/ GSM/Landline	Not set
VCSTCPMAXTXRT	Specifies the maximum number of re-transmissions.	/Ethernet/WIFI/ GPRS/CDMA/ GSM/Landline	Not set
VCSTCPINITTXVAR	Specifies the initial value for mean RTT (Round Trip Time) variation (in milliseconds).	/Ethernet/WIFI/ GPRS/CDMA/ GSM/Landline	Not set

**Table 7** Parameters that can be used for Performance Tuning

Parameter	Description	Applicable Media	Values
VCSIDLEDISCTO	<p>Specifies the time-out value to perform netdisconnect, while there are no active sockets after netconnect. If the value is set to 0 or entry not found, Communication Server will not perform netdisconnect from the network. This value is configured in milliseconds and can take a maximum up to 999999 milliseconds.</p> <p>Following are the timer behaviors:</p> <ul style="list-style-type: none"> <li>• If the last socket connection is closed, Communication Server will start the timer and upon time-out, will perform netdisconnect.</li> <li>• After netdisconnect, if there are any client requests for socket connection, Communication Server performs netconnect. If netconnect fails to connect, then VCS_ERR_NETCONN_FAILED session error value (1018) is returned in the next send response.</li> <li>• After the activation of the timer, if any other client application sends socket connect request within the time-out period, then this timer is deactivated.</li> </ul>	/Ethernet/WIFI/ GPRS/CDMA/ GSM/Landline	Not set





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