Release Notes for Cisco CDA Visual Quality Experience Application Release 3.5

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Note In these release notes, unless it is explicitly noted that text applies to a specific VQE 3.5.X release, all statements concerning Cisco VQE, Release 3.5, apply to each VQE 3.5 release (3.5.1, 3.5.2, and so forth).

Contents

These release notes contain the following sections:

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Introduction

Cisco Content Delivery Application (CDA) Visual Quality Experience Application (VQE) Release 3.5 offers service providers a set of technologies and products associated with the delivery of IPTV video services. VQE is designed to improve the quality of IPTV services and subscribers' viewing experiences. VQE is part of an end-to-end solution from Cisco that builds video awareness into the network infrastructure. For VQE Release 3.5, Cisco VQE technology is intended for wireline operators who offer managed broadcast (multicast) IPTV services using xDSL.

Cisco CDA VQE Application Release 3.5 includes these major software components:

- VQE Server (VQE-S)—Software that runs on a Linux-based Cisco Content Delivery Engine 110 (CDE110 or CDE111) appliance located in the intelligent edge of the service-provider's network.
- VQE Client (VQE-C)—Software embedded in the subscriber's CPE—typically a set-top box.

These release notes cover VQE-S and VQE-C software and two related software components: VQE Channel Provisioning Tool (VCPT) and VQE Client Configuration Delivery Server (VCDS).

For a list of Cisco VQE documentation, see the "Related Documentation" section on page 40.

New and Changed Features and Functionality

The following sections provide a summary of new and changed VQE features and functionality relevant for Cisco VQE Release 3.5:

Enhancements and Changes for Cisco VQE Release 3.5.11

Cisco VQE Release 3.5.11 is a maintenance release for the VQE Server only. It contains no new software for the VQE Tools server or the VQE Client, and has no new enhancements.

Enhancements and Changes for Cisco VQE Release 3.5.10

Cisco VQE Release 3.5.10 has the following enhancement:

- VCDS on the VQETools system has been enhanced to allow up to five million STB identifiers in the group map configuration file. Previous releases had a limit of one million.

- VQES has Bandwidth Broker Client support added.

Enhancements and Changes for Cisco VQE Release 3.5.9

Cisco VQE Release 3.5.9 is a maintenance release for the VQE Server only. It contains no new software for the VQE Tools server or the VQE Client, and has the following enhancement:

- Internal memory algorithm has been enhanced to reduce memory. This would allow for larger channel lineups, especially those with an extremely low e-factor and high IGMP join values, to fit in memory. One effect of this memory reduction is that the internal MPEG RAP interval caching space is now much more efficient. However, as a result, it is possible that a stream that previously worked with RCC could sporadically see the RCC be rejected with a "No RAP" reason (especially for large GOP-size streams). If this occurs, increase the VCDB vqe.vqes.rap_max_interval parameter to the correct value to support the streams.

Enhancements and Changes for Cisco VQE Release 3.5.8

Cisco VQE Release 3.5.8 has the following enhancement:

- The internal parameter vqe.vqes.max_pkts, used to specify the maximum number of packet buffers in the VQE-S Cache Manager, is made visible in the VCDB. The maximum number of packets has increased from 1 million to 1.3 million. The default value remains unchanged at 1 million packets.

Enhancements and Changes for Cisco VQE Release 3.5.7

Cisco VQE Release 3.5.7 is a maintenance release for the VQE Server only. It contains no new software for the VQE Tools server or the VQE Client, and has no new enhancements.

Enhancements and Changes for Cisco VQE Release 3.5.6

Cisco VQE Release 3.5.6 has the following enhancement:

- VQE-C system configuration parameter, log_level, can be modified, with immediate effect, within VQE-C system configuration by assigning a new value to it within the Network Configuration or the Override Configuration.

Enhancements and Changes for Cisco VQE Release 3.5.5

Cisco VQE Release 3.5.5 has the following enhancements:

- VQE-C provides a data path for packets from UDP MPEG2-TS streams and RTPv2 streams that are not configured in the VQE-C channel line up. No VQE services (that is, Error Repair, Rapid Channel Change [RCC], or RTP reports) are provided by the VQE-C for these streams. The VQE-C acts as a pass-through device for UDP packets. For RTP streams, the VQE-C provides reordering of packets. The VQE-C autodetects any switch of encapsulation type on joining a new stream, or following an underrun of packets on a stream. The VQE-C maintains statistics for UDP and non-VQE RTP streams. For UDP streams, the VQE-C provides counters for the number of packets received and processed, and for the number of packets dropped. For non-VQE RTP streams, the existing primary RTP counters include the number of non-VQE RTP packets received and processed, and the number of non-VQE RTP packets dropped. For the VQE-C to handle UDP and non-VQE RTP streams, the VQE-C configuration parameter qoe_enable must be set to TRUE to

initialize the VQE-C when it starts. A new VQE-C configuration parameter, integrated_rtp_fallback, is provided to disable VQE-C support for non-VQE RTP streams. A new VQE-C configuration parameter, udp_passthru_support, is provided to enable VQE-S support for UDP streams.

- VQE-C supports multiple concurrent Rapid Channel Changes (RCCs). A new VQE-C configuration parameter, rcc_max_concurrent, limits the number of channels that can be simultaneously bound using RCC. If an attempt is made to exceed the maximum number of RCCs on the VQE-C, a system message is logged and the VQE-C counter, concurrent_rccs_limited, is incremented.
- VCPT provides an option on a per-channel basis to send RTCP non-acknowledgement (NACK) compound packets from the VQE-C to the VQE-S to request retransmission of missing packets without sending Receiver Reports (RRs) to conserve RTCP bandwidth on the access link. Using the VCPT, a channel can be configured to send RTCP NACK compound packets without RRs by choosing the enable reduced-size RTCP option. The reduced-size RTCP NACK compound packet for unicast retransmission is comprised of a source description (SDES), publish ports (PUBPORTs), if present, and a generic RTP feedback (RTPFB) NACK. The VQE-S Application Monitoring Tool (AMT) provides a new per-channel counter, Reduced Size RTCP Received, to display the number of RTCP NACK compound packets received without RRs.
- VQE-S Exporter provides an option to omit RTCP NACK compound packets, with or without RRs, from the RTCP data sent to the VQM application. Exporting RTCP NACK compound packets may consume a significant portion of the bandwidth on the link between the VQE-S and the VQM application, depending on the packet loss observed at the VQE-C. A new VCDB configuration parameter, vqe.vqes.exporter_filter_nack, is added to enable RTCP NACK compound packets to be omitted. The VQE-S AMT contains a new counter on the RTCP Exporter tab that displays the number of RTCP NACK compound packets excluded from the RTCP data exported to the VQM application.
- VQE-C sends a new RTCP XR block to the VQE-S to assist in performing channel diagnostics. The Diagnostic Counter block contains the following counters:
  - Number of underruns per channel
  - Number of overruns per channel
  - Number of post-repair losses
  - Number of primary RTP drops due to late packet arrival
  - Number of repair RTP drops due to late packet arrival
  - Number of output queue drops

Enhancements and Changes for Cisco VQE Release 3.5.4

Cisco VQE Release 3.5.4 has the following enhancement:

- On the VQE-C, the parameter, rcc_extra_igmp_ip, is added. Use of this parameter may be required for certain vendor-specific DSLAMs, which do not stop multicast traffic flow on an IGMP leave. This parameter specifies an interim multicast IP address for the VQE-C to briefly join after an RCC has been initiated, which stops the flow of multicast data on the old channel, and therefore ensures sufficient capacity on the access link for the unicast burst for the new channel. The multicast IP address specified should be an unused address, and should not correspond to any actual channel with traffic.

Enhancements and Changes for Cisco VQE Release 3.5.3

Cisco VQE Release 3.5.3 has no new enhancements.

Enhancements and Changes for Cisco VQE Release 3.5.2

Cisco VQE Release 3.5.2 has no new enhancements.

Enhancements and Changes for Cisco VQE Release 3.5.1

Cisco VQE Release 3.5.1 has the following enhancements and changes:

- The VQE-S and the VQE Tools server provide the following additional Simple Network Management Protocol (SNMP) MIB support:
  - New vqe-specific SNMP MIB, CISCO-VQES-MIB, is integrated with the VQE-S platform to make information on channels, Unicast Retransmission, and RCCs available to a Network Manager System (NMS). The MIB supports a channel status trap which is triggered when a channel's state changes. Sending channel status traps is optional, and is configured using the VCDB parameter, system.snmp.channel_trap_enable.
  - New vqe-specific MIB, CISCO-VQE-TOOLS-MIB, is integrated with the VQE Tools server to make information on the VQE Configuration Delivery Server (VCDS) available to the NMS.
  - On both the VQE-S and the VQE Tools server platforms, a new MIB, CISCO-SYSLOG-MIB, and it's capability file, CISCO-SYSLOG-CAPABILITY, are integrated to allow system messages to be converted to syslog (system messages) traps and sent to a NMS. Sending syslog traps is optional, and is configured using the VCDB parameters, system.snmp.syslog_trap_enable and system.snmp.syslog_trap_priority.

  All MIBs are read-only in the VQE 3.5 release.
- VQE-S Application Monitoring Tool (AMT) provides the capability to globally reset the displayed values for a subset of channel, Unicast Retransmission, RCC, and capacity counters across all AMT browser sessions. The true value of these counters can be restored.
- VQE-S AMT displays a new set of counters and statistics to provide VQE-S capacity limit information. These counters and statistics indicate the amount of Error Repair requests, RCC requests, and client requests that have been rejected due to VQE-S capacity limits being exceeded.
- VQE-S and the VQE Tools server provide an option to import a channel configuration from a CSV (Comma Separated Values) or XML (Extensible Markup Language) file. The VCPT also provides an option to export a channel configuration to a CSV or an XML file.
- VQE-S and the VQE Tools server support sending system messages by means of UDP to one or more remote servers for centralized logging. The VCDB parameter, system.syslog.remote_server, is used to specify the IP address of a remote server. The underlying syslogd process has been replaced by the more advanced syslog-ng process to accomplish this.
- On the VQE-S and the VQE Tools server, the configuration of static routes is simplified. In release VQE 3.4 and earlier releases, using the Configuration Tool, a static route for an ingest or a management interface was created using the Management Route(s) menu, and a static route for a traffic interface was created using the Default Gateway menu. In the current release, all static routes are created using a new Static Route(s) menu. Similarly, a new VCDB parameter network.route.static_route is introduced, and the VCDB parameters, network.route.mgmt_route and network.route.default_gateway, are deprecated.
- VQE-C's dependency on the open source libraries, libcli and libconf, is removed. The libraries are replaced with Cisco-based alternatives that provide equivalent functionality and user experience.
- On the VQE-C, the parameter, src_ip_filter_enable, has been modified. When this parameter is set to true, the VQE-C will place a source IP filter on a channel based on the bind or channel update API settings for the channel.

- VQE-C CLI has been enhanced with a "show tech-support" command for gathering debug information, as well as a "history" command for ease of use.
- VCPT GUI has been updated with a direct link to the VCDS AMT for monitoring the VCDS status.
- Intel packages for dealing with hardware alarms (IPMI Management Utilities, One-Boot Flash Update Utility, SysCfg Utility) have been added to the VQE-S and VQE Tools servers.

System Requirements

The VQE-S runs on one Content Delivery Engine 110 (CDE110) appliance. The VCPT and the VCDS run on a separate CDE110 appliance.

The CDE110 platform can be one of the following:

- Cisco CDE110 (models CDE110-1-036TXA-K9 and CDE110-1-036TXD-K9)
- Cisco CDE111 (models CDE111-2-146TXA-K9 and CDE111-2-146TXD-K9)

The Cisco CDE110 comes with the required software pre-installed—either VQE-S software or Tools (VCPT and VCDS) software. In each case, the required Linux, Apache web server, and other software is also pre-installed.

To access the VQE-S Application Monitoring Tool (AMT), the VCDS AMT, or the VCPT, you need a web browser. For these tools, the following web browsers are supported:

- Microsoft Internet Explorer version 6.0 or later
- Mozilla Firefox version 2.0 or later

The minimum screen resolution required for VQE-S AMT, VCDS AMT, and VCPT is 1024 x 768 pixels.

To display the Channels Status Summary graph of active, inoperative, and inactive channels in the AMT VQE-S Status window, Adobe Flash Player must be installed on the computer that hosts the browser accessing AMT. Adobe Flash Player is free and can be found at this URL:

http://get.adobe.com/flashplayer/

Important Notes

The following important notes apply to all VQE Release 3.5 installations:

Configuring Management Interfaces When Performing an Upgrade

If you are upgrading a VQE from VQE Release 3.1, 3.2, or 3.3 to Release 3.5, all Ethernet interfaces on the VQE-S or VQE Tools host will be, by default, used as management interfaces. Therefore, management traffic is allowed on all Ethernet interfaces. *You must use the VQE Configuration Tool to limit the interfaces where management traffic will be allowed.*

For information on designating Ethernet interfaces as management interfaces, see the “Interface for a Management Network” section in Chapter 2 of the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.

For information on using the VQE Configuration Tool, see Chapter 7, “Configuring VQE Server and VQE Tools,” in the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.

Configuring Static Routes When Performing an Upgrade

If you are upgrading a VQE from an earlier VQE Release 3.X to Release 3.5, all static routes to the management and access networks are configured using the new static route parameter. In VQE Release 3.5, the VCDB parameters, network.route.mgmt_route and network.route.default_gateway, are deprecated, and replaced with the new VCDB parameter network.route.static_route. The static route parameter specifies the subnet IP address and prefix length of the target network (that is, the management, distribution, or access network), and the gateway IP address on the edge router. The target network is specified as 0.0.0.0/0 for static routes to the access network.

For information on configuring default routes, see the “Static Route Configurations - IP Address, Prefix Length, and Gateway Address ” section in Chapter 2 of *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5.*

Security Restrictions for Logins and Root Privileges

For security reasons, the following restrictions apply to VQE:

- Root user cannot use Secure Shell (SSH) to log in to a CDE110 that hosts VQE-S or VCPT. Also, the root user cannot log in to VQE-S AMT, VCDS AMT, or VCPT. The vqe user should be used instead. The vqe user is a pre-created Linux user ID and has its password set during CDE110 initial system configuration.
- Only users in the wheel group can use the **su** or **sudo** commands. By default, the vqe user is in the wheel group.

If you want to add user accounts to the wheel group so that additional users can use **su** and **sudo**, log in as root and issue the following command:

usermod -G wheel *username*

In the preceding, *username* specifies the user who will be added to the wheel group.

Random "rtc: lost some interrupts at 8192Hz." Messages Displayed on Serial Console

A message or block of messages indicating "rtc" has lost some interrupts can appear sporadically on the serial console, usually after entering a command, but the message is unrelated to any specific command.

No workaround is needed. This does not appear to have any operational impact and is believed to be information only related to an underlying Linux process.

Deprecated sysctl Message Displayed on Serial Console

On the serial console, the system will occasionally display a message of the form:

```
process `sysctl' is using deprecated sysctl (syscall)
net.ipv6.neigh.eth4.retrans_time; Use net.ipv6.neigh.eth4.retrans_time_ms instead.
```

No workaround is needed. This has no known operational impact and is a Red Hat Linux binary message.

After a VQE Downgrade, Web Browser Displays Incorrect Fields for VQE-S AMT, VCDS AMT, or VCPT

After you have downgraded VQE software and then use the downgraded VQE release, it is possible that incorrect fields will be displayed for VQE-S AMT, VCDS AMT, or VCPT. In this situation, you are seeing the fields that were provided by your previous VQE release and that have been cached by the web browser.

The correct VQE-S AMT or VCPT fields will be displayed after you delete the files in your web browser cache.

Limitations and Restrictions

Cisco CDA Visual Quality Experience Application, Release 3.5, technology is intended for wireline operators who offer managed broadcast (multicast) IPTV services using xDSL.

See the following sections for information on other limitations and restrictions in Cisco VQE, Release 3.5:

- "Changing System Time Causes Unicast Retransmission and RCC Disruptions" section on page 8
- "Load Balancing May Not Work Correctly When More Than 16 Interfaces Are Attached to an Edge Router" section on page 10
- "For OSPF Routing, Ethernet Interfaces Require a Direct Layer-3 Connection to Router" section on page 10

Changing System Time Causes Unicast Retransmission and RCC Disruptions

When the system time is changed on a VQE-S that is actively repairing network errors, all Unicast Retransmissions will stop indefinitely, and output gaps will be seen on the VQE Clients.

- When the system time is moved forward, the VQE-S receives requests for Unicast Retransmission and RCC but does not send the repairs/RCCs to the VQE Clients on the set-top boxes.
- When the system time is moved backward, all channels go to an inactive state and no Unicast Retransmission and RCC operations are performed.

For a VQE-S server that is actively repairing network errors, an explicit system time change (that is, by using the **date** command) will always result in the failure of Unicast Retransmission and RCC operations until corrective action is taken.

Workaround: Any time change performed on the VQE-S system should be done during a maintenance window. The procedures for changing the date and time vary depending on whether Network Time Protocol (NTP) or the Linux **date** command is used. See one of the following sections:

- "Performing a Date and Time Change with NTP" section on page 9
- "Performing a Date and Time Change with the Linux date Command" section on page 9

Note Using the local clock *is not* the recommended procedure for running with accurate time. Using NTP is recommended to keep the VQE-S services operational.

Performing a Date and Time Change with NTP

When performing a date and time change with NTP, do the following:

Step 1 Log in as root.

Step 2 Stop the VQE-S services by issuing the following command:

```
[root@system]# service vqes stop
```

Step 3 Stop the ntpd service by issuing the following command:

```
[root@system]# service ntpd stop
```

Step 4 If needed, set the time zone with the **vqe_cfgtool** command's **-config** option. Use the Configuration Tool's System Parameters menu and the Timezone choice.

Step 5 Set the system date and time to a date and time close to the NTP server date and time by issuing the following command:

date -s "*date_time_string*"

For example:

```
[root@system]# date -s "16:55:30 July 7, 2008"
```

Step 6 Synchronize the clock to the configured external NTP servers by issuing the following command:

```
[root@system]# ntpd -q
```

If the system clock is off by a lot, the command will take considerable time to return.

Step 7 Start the ntpd service by issuing the following command:

```
[root@system]# service ntpd start
```

Step 8 Synchronize the hardware clock by issuing the following command:

```
[root@system]# /sbin/hwclock --systohc
```

Step 9 Check NTP synchronization

```
[root@system]# ntpq -p
```

Step 10 Reboot the VQE-S server by issuing the following command:

```
[root@system]# init 6
```

Performing a Date and Time Change with the Linux date Command

When performing a time/date change with the Linux **date** command only, perform the following commands:

Step 1 Log in as root.

Step 2 Stop the VQE-S services by issuing the following command:

```
[root@system]# service vqes stop
```

Step 3 If needed, set the time zone with the **vqe_cfgtool** command's **-config** option. Use the Configuration Tool's System Parameters menu and the Timezone choice.

Step 4 Set the system date and time by issuing the following command:

date -s "*date_time_string*"

For example:

```
[root@system]# date -s "16:55:30 July 7, 2008"
```

Step 5 Synchronize the hardware clock by issuing the following command:

```
[root@system]# /sbin/hwclock --systohc
```

Step 6 Reboot the VQE-S server by issuing the following command:

```
[root@system]# init 6
```

Load Balancing May Not Work Correctly When More Than 16 Interfaces Are Attached to an Edge Router

With Cisco routers, there is a limitation in the edge router: Only the first 16 route matches for Feedback Target addresses are considered when routing requests to the VQE-S servers from the access network. If more than 16 interfaces to service Unicast Retransmission and RCC request are attached to the edge router and are serving the same Feedback Target addresses, load balancing across the VQE-S servers will not work correctly.

As an example, if four VQE-S servers that each have five Ethernet interfaces serving the same Feedback Target addresses are attached to the edge router, there is a total of 20 Ethernet interfaces serving the same Feedback Target addresses and load balancing across the VQE-S servers will not work correctly.

For OSPF Routing, Ethernet Interfaces Require a Direct Layer-3 Connection to Router

For OSPF routing on the VQE-S server, the Ethernet interfaces used for VQE-S traffic *must have* a direct Layer-3 connection to the edge router.

Resolved and Open Caveats

The following sections provide information on resolved and open caveats:

Resolved Caveats for Release 3.5.11

The following caveats have been resolved in Cisco VQE, Release 3.5.11:

CSCtw78673

Input drops seen on the bond interface. When a VQES has the input interface as a bond (two underlying Ethernet interfaces), and the data rate is high (around 1 Gbps), then input drops may occur on the bond interface (as shown in the output of the **ifconfig bond1** command).

CSCty17266

The OSPF values are not applied to the bond interfaces. When configuring OSPF values (for example, "hello interval") on VQES, they are only applied to the Ethernet interfaces, and not the bond interfaces, which could result in OSPF not working properly over bond interfaces.

Resolved Caveats for Release 3.5.10

The following caveats have been resolved in Cisco VQE, Release 3.5.10:

CSCtu09981

The BWB client on the VQES switches the port on which it is sending requests to the BWB. After the VQES receives a response from the BWB, it may use a port in the response to send subsequent requests to the BWB.

CSCtu03340

When the VQES sends a request packet to the BWB, the client IP address byte order is reversed.

CSCtu10016

Bandwidth Broker Client does not report or respond to response code correctly. This may result in improperly refused or accepted RCCs.

CSCtu03329

The bwb_client_timeout parameter on VQES allows invalid high values to be chosen.

CSCtu10710

In the debug message for BWB, the version and flags print as one field. They should be two separate 4-bit values.

CSCtu10030

If the BWB timeout is above 10ms, then the RCC request itself will be rejected with an "RB request time in past" error.

CSCtu02993

In the vcdb.conf.sample file, the bwb_client_timeout parameter has no minimum or maximum value, and also does not include the unit of measure, which is milliseconds.

CSCtt42406

When the vqec_ifclient_config_override_update() API is called with no override parameters (for example, tags[0] == NULL), the API rejects the request and the following errors are logged:

- <VQEC-3-VQEC_SYSCFG_ERROR> failed to load configuration buffer - (Failed to read configuration file. error line = 0)
- <VQEC-3-VQEC_CONFIG_ERROR> Override Configuration Update Error (Configuration update failed, existing config remains intact)

CSCtt41584

The cvqsTotalAcceptedRCCs value is incorrect in the VQES MIB. When querying the VQES MIB, the cvqsTotalAcceptedRCCs OID returns the number of completed RCCs instead of the number of accepted RCCs.

Resolved Caveats for Release 3.5.9

There were no resolved caveats in Cisco VQE, Release 3.5.9.

Resolved Caveats for Release 3.5.8

The following caveats have been resolved in Cisco VQE, Release 3.5.8:

CSCtr04792

Under rare conditions, the VQE-C crashes with an assertion in the Zone Manager code stating that the magic cookie of the zone is incorrect. The crash only occurs when the VQE-C is binding to a channel with RCC enabled and it receives duplicate or invalid APP packets which are slightly delayed. The APP packets arrive after the VQE-C has already received the first few repair packets of an RCC burst.

CSCtq76380

When using the **vqereport** command to gather VQE system information, the VQE-S Control Plane process (vqes_cp) may crash if RCC is disabled and RCC histograms are accessed.

CSCtq57941

Build errors occur when building the VQE-C kernel module with Linux kernel version 2.6.31. Build errors also occur due to a duplicate declaration of the function inet_ntoa_r(). When new versions of the GCC compiler or the uClibe library are used to build the kernel module, build errors occur because the GCC complier and the uClibe library also define the function inet_ntoa_r().

CSCtl91131

The .so library has undefined dependencies on both the UPnP (Universal Plug and Play) and the libevent symbols when the VQE-C is built using the pic-vqec build target in both the user space and kernel space versions to build Position Independent Code (PIC). The undefined dependencies occur even when UPnP is disabled.

CSCtg76837

The VQE-C data plane module occasionally causes a hard lock-up of the entire VQE-C system following an RCC. If you are monitoring the stack usage in the kernel, you see the high watermark approach or exceed the maximum size of the stack.

Warning messages may appear on the system console or in the system logs which indicate that a sleeping function is being called while a lock is being held. Warning messages from the kernel in relation to the kmem_cache_create() function may also appear on the system console or in the system logs.

The hard lock-up is typically observed in the first few seconds following an RCC. It only occurs when the kernel is using a fixed stack size of 4 KB or less.

CSCtr26964

The RCC output bandwidth currently in use, as shown by the AMT, persistently exceeds the amount that is actually being used for the RCCs currently in progress. Over time the discrepancy between the reported level of RCC output bandwidth and the actual level keeps increasing until RCCs begin to fail due to lack of available output bandwidth.

It is possible that there may be rare corner cases which could lead to leaks of RCC output bandwidth along the code paths that are addressed by this defect.

With the fix for this defect in place, it is possible to verify that the error condition would have been hit without the fix, and that the error condition has been successfully prevented by the fix, if either of the following two error messages are observed:

- VQES_CP-6-ERA_OUTBW_MGMT: Output bandwidth manager information: freeing [int] bps on fresh allocation
- VQES_CP-6-ERA_OUTBW_MGMT: Output bandwidth manager information: freeing [int] bps on repair sender deletion

CSCtn74958

On the VQE-C CLI, the output of the **show tuner all detail** command may omit information relating to the Input Shim streams.

CSCtn26612

Macroblocking occurs on UDP channels. When the VQE-C is enabled and bound to a UDP stream, the STB shows video artifacts.

Resolved Caveats for Release 3.5.7

The following caveat has been resolved in Cisco VQE, Release 3.5.7:

CSCto77273

During an RCC on a scrambled channel, the VQE-S sends the ECMs in an RTCP App packet. Under certain conditions, the ECMs may be present in the RTCP App packet in an incorrect order. Additionally, if using only a single ECM, an outdated ECM may be placed into the RTCP App packet.

This issue occurs when ECMs rotate without changing CRC values. This may also occur if two video streams are alternated with each stream having static ECMs but different table_id values.

Resolved Caveats for Release 3.5.6

The following caveats have been resolved in Cisco VQE, Release 3.5.6:

CSCtl71640

If the VQE-C thread is not scheduled for an extended period of time (that is, a period of time larger than the er_enable time in the APP packet) immediately after the start of an RCC operation, the VQE-C Data Plane (DP) may crash at an assertion. The VQE-C console may print an error stating that an assertion has failed in zone_mgr.c.

CSCtj67882

The VQE-C command **tuner bind <tuner-name> <channel-url> tr-135 gmin <gmin> slmd <slmd>** should set TR-135 parameters, and the settings should effect the TR-135 counters, which are visible in the output of a **show channel counters** command. However, if you attempt to set the TR-135 parameters while a tuner is binding to a channel, all of the TR-135 counters show a value of 0.

CSCtl83954

When binding to a channel that has been previously bound to, but which is not included in the VQE channel lineup, the tuner bind may fail with errors stating that the channel is invalid or that the channel is not in the database. The failure does not occur on the first bind to the channel, but occurs on subsequent binds to the channel.

CSCtl83962

The VQE-C may hang during initialization when the VQE-C is built with UPnP support and the host system has no default route configured.

CSCtk08844

When an SNMP MIB query is performed on VQE server, each query triggers a log message to be stored in the /var/log/snmpd.log file. If queries are performed continuously, this could result in the log partition filling up in a short period of time.

CSCtl06308

Rapid Channel Changes are refused with the error message “MP Internal Error”. The Failed to TLV - encode PCR counter on the Advanced window of the Channel tab of the VQE-S AMT also increments. Refusals are more likely to occur on channels with large GOP sizes and when the VQE-C has a large (>5000) packet pool size.

CSCtk99536

On a highly scaled VQE-S with many thousands of VQE-Cs, a leak may occur which results in the VQE-S miscalculating the output bandwidth. As a result, the VQE-S determines that there is no output bandwidth available and rejects RCC requests, although there is still output bandwidth available.

CSCtl00270

If a VCPT pushes a channel lineup to multiple VCDS servers, the timestamp used could be different for each VCDS, resulting in logically equivalent channel lineup files with different xsums. As a result, the VQE-C could needlessly retrieve the channel lineup.

CSCtl92190

Artifacts and loss of audio are seen on channel change. If the PMT is changed in the stream, the VQE-S may still insert the original PMT into stream, causing possible artifacts and audio loss.

Resolved Caveats for Release 3.5.5

The following caveats have been resolved in Cisco VQE, Release 3.5.5:

CSCti93601

The VQE-C crashes when using the CLI while issuing a **show** command that searches the output for some particular content to include. The crash occurs when the output is piped to include (that is, a search of the output is performed for a specific string output using the **| include** CLI output modifier).

CSCti28113

The system messages log file fills with SNMP information messages. Each time the VQE-S receives an SNMP MIB query, a messages is logged in the /var/log/messages file by default. If a MIB is constantly queried, the log partition can fill over a short time frame.

CSCtj21395

On the VQE-C, the source IP address in the RTSP SETUP message is set to a value of 0.0.0.0 when the VQE_C is running in kernel mode. When the code calling the **vqe_c_ifclient_socket_open** function passes non-zero values for the address and port arguments, the source IP address in the RTSP SETUP messages is set to null, representing an address of 0.0.0.0. The input value of the address is entirely ignored. The same issue occurs for the rtp_port and the rtcp_port arguments of this function.

CSCti72855

On the VQE-C, a dependency on libupnp exists even when UPnP (Universal Plug and Play) is not being used. The VQE-C build attempts to link against the libupnp library even when the VQE-C is not configured with the **--enable-upnp** option. The build may fail due to missing dependencies.

CSCti43146

On the VQE-C, when an invalid keyword is provided for a boolean parameter in the system configuration, the VQE-C initializes without providing an error message. Valid boolean value are true and false.

CSCti37956

On the VQE-C, no documentation is provided for API parameters which are in network byte order. The VQE-C APIs which accept or return IP addresses and ports may behave unexpectedly. Address and port values are provided in host byte order in VQE-C function calls.

CSCtg50534

On the VQE-C, on changing the source address of a channel or a stream, failover timing statistics are missing from the CLI output.

CSCti79554

When building the VQE-C, running **make** fails, stating that the libixml or libthreadutil libraries cannot be located. The build server is missing libixml.so.2 and libthreadutil.so.2 from the /lib and /usr/lib directories.

CSCtj31265

A router serving as the default gateway for STBs experiences higher than expected ARP loads and a STB responds with ICMP unreachable messages on the RTCP repair port.

When the VQE-S has error repair (ER) enabled on a channel, and the VQE-C has both ER and RCC disabled, the VQE-S sends periodic RTCP reports to the VQE-C which results in the STB sending ICMP port unreachable/ARP request messages to its default gateway.

CSCtj18597

After performing an ISO clean installation, it is not possible to access or perform an SNMP WALK of the CISCO-VQES-MIB using textual MIB names or object identifiers (OIDs).

CSCth05747

An SNMP GET command on any channel-related parameters of the CISCO-VQES-MIB fails displaying the following “index out of range” error message:

```
snmpget -v2c -c public localhost CISCO-VQES-MIB::cvqsChannelMulticastIPType.1
CISCO-VQES-MIB::cvqsChannelMulticastIPType.1: Unknown Object Identifier (Index out of
range: 1 (cvqsChannelIndex))
```

SNMP WALK and SNMP GETNEXT commands are not impacted.

CSCti05730

The VQE-S sends outdated CAS Information for Verimatrix systems. VQE accelerated channel changes take longer than expected for channels encrypted with Verimatrix CAS. Also, some artifacts may be seen at the beginning of the channel change. This occurs on channels encrypted with Verimatrix CAS, where all key information is contained in a single ECM packet.

CSCth41073

On the VQE-C, the parameter rcc_extra_igmp_ip cannot be set to a value of 0.0.0.0, its default value, in the VQE-C system configuration. The VQE-C returns an error indicating that this value is invalid.

CSCti28919

When accessing the VQE-S AMT or the VCPT on a VQE-S from a Firefox web browser, the following security error is displayed in the Firefox console.

```
server does not support RFC 5746, see CVE-2009-3555
```

The functionality is not limited in any way.

CSCtj28523

After upgrading the VQE-S, the Error Repair and RCC window of the VQE-S AMT displays the older Histogram tab from Release 3.2 instead of the newer Excess BW and the CC Times tabs introduced in Release 3.4.3.

Workaround: Delete the /usr/share/tomcat5/work/Catalina/localhost/ems directory and all contents on VQE-S, and restart the tomcat5 process using the following commands:

```
rm -rf /usr/share/tomcat5/work/Catalina/localhost/ems
service tomcat5 restart
```

Resolved Caveats for Release 3.5.4

The following caveats have been resolved in Cisco VQE, Release 3.5.4:

CSCtf72611

On the VQE-C CLI, the filter "*command* | **include** *pattern*" that is used when executing commands does not work as intended. It does not display only the lines from the resulting output that match string pattern.

CSCtf76276

When using VQE RCC on an Alcatel ATM DSLAM, macroblocking may start immediately on a change to a new channel for a short time. Macroblocking can occur if the combined bandwidth of the previous channel's multicast stream and the bandwidth allocated for RCC on the new stream (the new stream's multicast bitrate * [1 + VQE e-factor used for the RCC]) exceeds the bandwidth of the access link. The problem occurs because the DSLAM does not stop the old multicast stream when the IGMP leave message for the old stream is received. Instead, it waits for an IGMP join message for the new multicast stream before stopping the old stream. Therefore, some of the bandwidth is still being consumed by the

old stream, and there is not enough bandwidth remaining on the access link for the unicast burst required to start the RCC. The problem disappears as soon as the VQE-C joins the multicast stream for the new channel, usually several hundred milliseconds to several seconds after the start of the unicast burst.

CSCtf97216

On a VQE-S, if the /etc/sysconfig/iptables file has become corrupt and the **vqe_cfgtoo**l command with **-apply** is run, the VQE-S detects an issue with the iptables but still prompts the user to restart the VQE-S even though no configuration change has been made.

CSCtg36388

RCCs are rejected only on certain isolated channels when fast decorder fill is enabled. This scenario is more likely to occur with a large excess bandwidth fraction and channels with large PTS-PCR offsets (that is, video buffering delay). The counter Number of Fastfill Enabled RCCs on the Advanced window of Channel tab on the VQE-S AMT also increments.

CSCtg50493

The documentation included in the VQE-C software TAR file is for the VQE 3.4 software release. The documentation includes the VQE-C Release Notes, the VQE-C System Integration Reference, and the VQE-C CLI Command Reference.

CSCtg62858

A segmentation fault may occur up to several seconds after tuning away from a VQE-enabled channel.

All of the following conditions must be met on the VQE-enabled channel for the segmentation fault to occur:

- RCC is enabled for the channel.
- RCC is enabled within the VQE-C configuration (that is, using the **rcc_enable** command).
- Per-client e-factors are configured within the VQE-C configuration, or passed via the vqec_ifclient_tuner_bind_chan() and the vqec_ifclient_tuner_bind_chan_cfg() APIs. The per-client e-factor configuration parameters are:
  - max_receive_bandwidth_sd
  - max_receive_bandwidth_sd_rcc
  - max_receive_bandwidth_hd
  - max_receive_bandwidth_hd_rcc
  - min_hd_stream_bitrate

CSCtg73674

Performing an SNMP GET of multiple OIDs fails. If this operation is followed by a SNMP GET of a single OID, and if that OID had been included in the previous SNMP GET of multiple OIDs, the SNMP GET of the single OID will also fail.

CSCth23904

When the VQE-C packet pool limit, defined by the system configuration parameter pakpool_size, is reached in kernel mode, packets are drained from the socket and thrown away. Several sk_buffs associated with the dropped packets are not correctly freed and are leaked in kernel space memory. The VQE-C must be running in kernel mode, and the packet pool must be fully used.

CSCtf54849

On the VQE-C, the commands **er en** and **sen en** do not work. The command **er en** is the shorthand notation for the command **error-repair enable** which is used to enable error repair on the VQE-C. The command **sen en** is the shorthand notation for the command **send-debugs-to-cli enable** which is used to send VQE-C debug messages to the CLI.

Resolved Caveats for Release 3.5.3

There were no resolved caveats in Cisco VQE, Release 3.5.3.

Resolved Caveats for Release 3.5.2

The following caveats have been resolved in Cisco VQE, Release 3.5.2:

CSCtf20798

The maximum value of the VCDS parameter vqe.vqes.igmp_join_variability is 500 ms. The maximum value should be increased to 1000 ms.

CSCtf39419

On the VQE-S, if the vqec_ifclient_chan_update() API is invoked for a channel on which Error Repair and RCC are disabled, a segmentation fault will occur.

CSCtf48671

Moving the system time backward on the VQE-C causes video to freeze. Although setting the clock should only be performed during a maintenance window, the VQE-C should handle this scenario in a more graceful manner.

CSCtf70302

On the VQE-S, when the option to send traps from system messages is enabled, traps are not generated, except for channel status traps. On the VQE Tools server, when the option to send traps from system messages is enabled, traps are not generated.

CSCtf78823

When the VQE-C is in kernel mode, the receive buffer (so_rcvbuf) is set too high. If the VQE-C is not scheduled for a long period of time, the socket buffers can fill up, which could cause the VQE-C to fail.

CSCtf99279

On the VQE Configuration Tool, when the Syslog Trap Priority menu, located under the SNMP Parameters menu, is set to it's default value of 2, traps are generated for system messages of all severity levels.

CSCtg04729

Video artifacts are seen on a RCC. The VQE-C CLI also reports late packets and an unreasonably large "actual_fastfill" value (that is, a value greater than 10 seconds). This may occur when fastfill is disabled on either the VQE-C, the VQE-S, or on both. This does not occur when a fastfill RCC is performed. The number of fastfill RCCs can be verified by checking the "Number of Fastfill Enabled RCCs" counter on the Advanced window of the Error Repair & RCC Statistics tab of the VQE-S AMT.

Resolved Caveats for Release 3.5.1

The following caveats have been resolved in Cisco VQE, Release 3.5.1:

CSCtb11357

The Linux bond driver selects the mac address of the lowest Ethernet interface in the bond group as the mac address for the entire bond. When the lowest Ethernet interface is removed from the bonding group, its mac address is still in use by the bond and the interface is unusable at this point.

CSCtc05432

It is not possible to specify an outbound interface when configuring a static route on the VQE-S or VQE Tools server. When configuring a static route to the management network or the distribution network, the VCDB parameter, network.route.mgmt_route, only specifies the subnet IP address and prefix length of the target network, and the gateway (next hop) IP address. When configuring a static route to the access network, the VCDB parameter, network.route.default_gateway, only specifies the gateway IP address.

CSCtc10926

When you remove one or more Ethernet interfaces from a bond interface using the VQE Configuration Tool and add these interfaces to another bond interface, the VQE-S hangs and the interfaces are brought down when you restart the network service.

CSCte50987

On the VQE-S, when an Ethernet interface underlying a static route to the management network is bounced (that is, transitions from up to down and then to up again), the static route to the management network is not recreated by the Multicast Load Balancer (MLB) when the interface is brought back up.

CSCte96266

The VQE-C kernel mode allocates packet pool memory for max_paksize packets, even though the packet payload buffer is never used in kernel mode.

CSCtc31877

The RTSP client reads the resolv.conf file for the first time when a DNS query is performed. This creates a problem in deployments where the resolv.conf file is updated after the system is up and running.

CSCtb42701

An "Invalid Picture Type in ES" message is displayed in the Advanced Channel Stats MPEG Parser: Error Status Listing. Under rare circumstances, this may lead to longer channel change times. The Stream is MPEG2, it is partially scrambled and the picture_start_code is not part of the same TS packet that the PES header is in.

CSCta56614

The SDP file provides the capability to enable or disable XR FLE blocks and XR status-summary blocks, but the file does not provide the capability to enable or disable Multicast Acquisition (MA) blocks.

CSCtb50384

An incorrect SSRC value is included in the Multicast Acquisition (MA) report. The set-top box SSRC value should match the Digital Content Manager (DCM) SSRC value of the primary multicast stream.

CSCtf17669

RCCs are refused with a message of "No TSRAP fits timing". The VQE-S AMT advanced counter "Failed to TLV-encode ECM" also increments. This occurs only on streams with multiple Conditional Access PIDs or Entitlement Control Message (ECM) PIDs.

Open Caveats for Release 3.5.1 through to Release 3.5.11

Cisco VQE Releases 3.5.1 through to Release 3.5.11 contain the following open caveat:

CSCtb19961

When running the ".bin" upgrade procedure, a “no second disk” failure is reported. On a CDE-111, the flash (second disk) drive /dev/sdb device can disappear from the disk table listing, usually after a reboot. This causes an error report in a bin upgrade process, and a failure if attempting the remote ISO upgrade procedure, which relies on the flash drive to successfully upgrade the VQE software.

Workaround: Reboot the CDE to recover the missing secondary flash disk.

CSCtf01027

The VQE-S MLB process normally monitors interfaces. The MLB withdraws or adds routes for an interface failure or recovery, respectively. However, if the initial route add fails, subsequent routes will not be monitored.

Workaround: Ensure that all interfaces are up and that all routes are valid when VQE-S is started, or restart VQE-S after all interfaces are working and routes are valid.

Installing VQE Release 3.5 Software

New Cisco CDE110 servers have Linux operating system, VQE-S and VQE Tools, and other needed software pre-installed. Table 1 shows the options for upgrading and installing software that Cisco VQE Release 3.5 supports.

Table 1 Options for Upgrading and Installing VQE Release 3.5 Software

Upgrade or Installation Type	Where to Get Information
To upgrade from an earlier VQE Release 3.X release to Release 3.5	"Upgrading VQE Software from an Earlier VQE Release 3.X to Release 3.5" section on page 24
To install a complete set of new VQE Release 3.5 software files on an earlier VQE Release 3.X system (equivalent of a factory install of VQE Release 3.5)	"Using an ISO Clean Installation to Install VQE Release 3.5 on an Earlier VQE Release 3.X System" section on page 30
To remotely perform an ISO clean installation or ISO full upgrade of VQE Release 3.5 software	"Performing an ISO Clean or ISO Full Upgrade Installation from a Remote Location" section on page 32

For overview information on the software installation types, see the "VQE Software Installation Types" section on page 22.

The VQE Configuration Management System (VQE CMS) plays a significant role in software upgrade installations. If you are not familiar with the VQE CMS, read Chapter 6, "Configuring VQE Server and VQE Tools," in the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.

VQE Software Installation Types

The following sections provide overview information on the VQE software installation types:

- "ISO Clean Installation" section on page 22
- "ISO Full Upgrade" section on page 23
- "VQE Incremental Upgrade" section on page 23

The term "ISO installation" comes from the ISO file system format that is used to burn the CD.

ISO Clean Installation

An *ISO clean installation* is used to install VQE software on a new CDE110 server. An ISO clean installation can also be used on an existing VQE system to restore the server to a factory default state. An ISO clean installation reformats the hard drive and reinstalls the operating system and other packages, such as the VQE software. All old configurations are removed.

After the ISO clean installation is complete, the system automatically reboots and allows you to log in as root. Next the VQE Startup Configuration Utility automatically runs. This utility allows you to specify initial configuration values for the CDE110 server and the VQE software. Using this input, the VQE Startup Configuration Utility generates initial VQE Configuration Database (VCDB) contents and reboots the CDE110 server. When the server comes back up, the VQE Configuration Engine applies the changes in VCDB to the configuration files under the /etc directory.

When an ISO clean installation is performed at the factory on a new CDE110 server, after the installation is complete, the server reboots and is powered down. When the CDE110 is powered on for the first time at the user site, the VQE Startup Configuration Utility automatically runs.

ISO clean installation software includes Cisco VQE, Redhat Linux, Apache web server, and other required facilities. The ISO installation software is distributed on one CD for VQE-S, and on one CD for VQE Tools. As an alternative, VQE software can be downloaded from Cisco.com. When you are burning a CD with the ISO software, use ISO format and a CD-R disk.

ISO Full Upgrade

An *ISO full upgrade* is used to upgrade VQE software on an existing CDE110 server and preserves the existing VQE configurations. An ISO full upgrade reformats the hard drive and reinstalls the operating system and other packages, such as the VQE software. An ISO full upgrade backs up the VQE-S, system, and network configurations, which are in the existing files under /etc. For parameters that will be under the control of the VQE CMS, it restores the parameter values (from the existing /etc configuration files) in the set of newly installed /etc configuration files.

ISO full upgrade software includes Cisco VQE, Redhat Linux, Apache web server, and other required facilities. The ISO installation software is distributed on one CD for VQE-S, and on one CD for VQE Tools. As an alternative, VQE software can be downloaded from Cisco.com. When you are burning a CD with the ISO software, use ISO format and a CD-R disk.

VQE Incremental Upgrade

A VQE incremental upgrade can be used to upgrade a CDE110 server where the Cisco VQE software—either VQE-S or VQE Tools—has previously been installed. A VQE incremental upgrade requires a CDE110 server with an existing operating system. A VQE incremental upgrade backs up the VQE-S, system, and network configurations, which are in the existing files under /etc. For parameters that will be under the control of the VQE CMS, a VQE incremental upgrade restores the parameter values (from the existing /etc configuration files) in the set of newly installed /etc configuration files.

A VQE incremental upgrade is done with an executable installer—a single executable file that includes all VQE-S packages needed for the upgraded VQE software version. Each VQE incremental upgrade requires that the system already has a previously released complete VQE software package installed, including configuration files. Otherwise, the VQE incremental upgrade installer quits and informs you to use an ISO installation.

A VQE incremental upgrade assumes that the existing software version is complete. It does not remove any extra software that is installed on your system and that is not required to run the VQE software. However, use of non-Cisco release software may produce unpredictable results and is not recommended or supported.

Downloading VQE Software from Cisco.com

You must be a registered Cisco.com user to download software from Cisco.com. To download a VQE software from Cisco.com, do the following:

Step 1 Browse to the software downloads area for VQE:

http://tools.cisco.com/support/downloads/pub/Redirect.x?mdfid=280836689

Step 2 Click the **+** sign to expand Cisco Content Delivery Applications.

Step 3 Depending on the type of server where software is being upgraded, click one of the following:

- Cisco Visual Quality Experience (VQE) Channel Provisioning Tools (VQE Tools)
- Cisco Visual Quality Experience Application (VQE-S)

Step 4 If needed, log in to Cisco.com.

Step 5 Click the software release that you need.

Step 6 Click the ISO installation software or VQE incremental upgrade installer that you need.

Step 7 Click **Download**.

Step 8 Follow the directions for downloading the ISO installation software or VQE incremental upgrade installer. Download the software to the /tmp directory.

Step 9 If you want release information, download any Release Notes or README file that is relevant to the software.

Step 10 If you downloaded ISO installation software and require a software CD, you must burn the software onto a CD. When burning the CD, use ISO format and a CD-R disk.

Upgrading VQE Software from an Earlier VQE Release 3.X to Release 3.5

To upgrade from an earlier VQE Release 3.X to Release 3.5 requires that you perform one of the following types of software installation on the Cisco CDE110 that hosts VQE-S and on the (optional) CDE110 that hosts the VQE Tools (VCPT and VCDS).

- VQE incremental upgrade installs a limited set of files—only those files that are needed to upgrade to the VQE 3.5 software. This is the recommended upgrade path because it is relatively fast (approximately a minute) and simple to perform. A VQE incremental upgrade preserves your earlier VQE 3.X configurations in VCDB and in the configuration files under /etc. If a configuration parameter is not configured by the earlier VQE 3.X configurations in VCDB, it will not be preserved.
- ISO full upgrade installs a complete new set of VQE, Linux, Quagga, and other files. An ISO full upgrade *does* backup and restore your earlier VQE 3.X configurations in files under /etc if the parameter will be under the control of the VQE CMS in Release 3.5. Use an ISO full upgrade if your situation *does* require that you install a complete new set of files and that earlier VQE 3.X configurations be preserved.

Note If you want to preserve your earlier VQE 3.X configurations for VQE Release 3.5, you must use a VQE incremental upgrade or an ISO full upgrade.

When using a VQE incremental upgrade to upgrade an earlier VQE 3.X release to Release 3.5, read each of the following sections, in the order shown:

1. "Backing Up VQE Release 3.X Files Before Upgrading or Installing Software" section on page 25
2. "Using a VQE Incremental Upgrade to Upgrade from an Earlier VQE Release 3.X to Release 3.5" section on page 26.

When using an ISO full upgrade to upgrade from an earlier VQE 3.X release to Release 3.5, read each of the following sections, in the order shown:

1. "Backing Up VQE Release 3.X Files Before Upgrading or Installing Software" section on page 25
2. "Using an ISO Full Upgrade to Upgrade from an Earlier VQE Release 3.X to Release 3.5" section on page 27

Backing Up VQE Release 3.X Files Before Upgrading or Installing Software

Caution An ISO clean installation or ISO full upgrade will format the hard disk on the CDE110. Formatting causes all data on the hard disk to be erased.

Before upgrading or installing software on a CDE110, be sure to backup all needed files to a safe location (for example, on a server separate from the CDE110s being upgraded).

Before the hard disk is formatted, an ISO full upgrade does a backup of configuration files under the /etc directory. After the hard disk is formatted, an ISO full upgrade restores your VQE 3.X configurations in the files under /etc—but only configuration items for which a VQE Configuration Database (VCDB) parameter exists are restored. It is recommended that you manually backup these files to another server before proceeding with an ISO full upgrade in case of a catastrophic failure.

When upgrading to or downgrading from one VQE Release 3.X to another Release 3.X, the following tables list the VQE Release 3.X files that you should backup prior to performing an ISO clean installation or ISO full upgrade.

- Table 2 shows the files that must be backed up for the CDE110 that hosts VQE-S.
- Table 3 shows the files that must be backed up for the CDE110 that hosts VQE Tools (VCPT and VCDS).

The easiest way to back up the /etc configuration files is to use the **tar** command to create a TAR file archive of all directories and files under /etc.

Note In addition to the files listed in these tables, there may be backup or alternate files in the /etc/opt/vqes directory or another location. These files must be backed up if you want them available on the upgraded CDE110.

If additional functions are enabled on the CDE110, there may be additional files not listed in these tables that need to be backed up.

Table 2 VQE-S Server: Files That Must Be Backed Up

File	Notes
all directories and files under /etc	These are the files needed to configure the CDE110 system except for the VQE-S AMT web application.
/usr/share/tomcat5/webapps/ems/WEB-INF/vqe.conf	VQE-S AMT configuration file with XML-RPC port numbers for management servers. If your deployment has not changed the default XML-RPC port numbers, the vqe.conf file does not have to be backed up.
/usr/share/tomcat5/webapps/ems/WEB-INF/classes/log4j.properties	VQE-S AMT log4j logging configuration file. If your deployment has not changed the default log4j configuration, the log4j.properties file does not have to be backed up.

Table 3 VQE Tools Server: Files That Must Be Backed Up

File	Notes
all directories and files under /etc	These are the files needed to configure the CDE110 system except for the VCPT web application.
/usr/share/tomcat5/webapps/vcpt/WEB-INF/classes/log4j.properties	VCPT log4j logging configuration file. If your deployment has not changed the default log4j configuration, the log4j.properties file does not have to be backed up.

Using a VQE Incremental Upgrade to Upgrade from an Earlier VQE Release 3.X to Release 3.5

This section explains how to use a VQE incremental upgrade to upgrade from an earlier VQE Release 3.X to Release 3.5. A VQE incremental upgrade preserves your earlier VQE 3.X configurations in VCDB and in the configuration files under /etc. If a configuration parameter is not configured by the earlier VQE 3.X configurations in VCDB, it will not be preserved.

Before running a VQE incremental upgrade installer, perform the following tasks:

1. Downloading VQE Software from Cisco.com, page 23
2. Backing Up VQE Release 3.X Files Before Upgrading or Installing Software, page 25

To run the VQE incremental upgrade installer to upgrade an earlier VQE Release 3.X release to Release 3.5, do the following:

Caution To be safe in case of a catastrophic failure, be sure to backup configuration files as described "Backing Up VQE Release 3.X Files Before Upgrading or Installing Software" section on page 25.

Step 1 If needed, log in as root on the CDE110 server where the VQE incremental upgrade installer was downloaded.

When you run a VQE incremental upgrade installer, you must have root privileges.

Step 2 Run the VQE incremental upgrade installer. For example:

```
[root@system]# /tmp/vqes-3.5.x-x.bin
```

The VQE incremental upgrade installer determines the current VQE software version, performs a sanity check on the existing VQE software, checks for the existence of needed configuration files, and does one of the following:

- If the preceding checks determine that there is a problem, the VQE incremental upgrade installer informs you that an ISO installation is required and exits.
- If the preceding checks determine that all is well, the VQE incremental upgrade installer displays:

```
You are currently running VQE version 3.x.x.
Do you want to install version 3.5.x (build xx) now? y/[n]:
```

Step 3 To install the software, enter y and press **Enter**.

The VQE incremental upgrade does the following:

- Upgrades/installs/uninstalls RPMs (as needed) and installs associated default configuration files.

- Performs installation post processing as follows:
  - Installs a new vcdb.conf.sample in the directory /etc/opt/vqes/.
  - Saves a set of factory default /etc configuration files associated with the RPM installation in the directory /vqe-etc/etc-pristine/.
- Runs the VQE Configuration Engine to apply VCDB values to the configuration files under /etc.

After the upgrade process completes, you can examine the /var/log/upgrade.log file to look for warning and error messages, and to find out if there were any configuration files (from your previous installation) whose contents were not completely applied to the new release.

The set of /etc configuration files from your previous installation are archived in a tar file in /vqe-etc/ prior to the upgrade. You can manually apply the values from these old configuration files if these configurations must be restored.

Using an ISO Full Upgrade to Upgrade from an Earlier VQE Release 3.X to Release 3.5

This section explains how to use an ISO full upgrade to upgrade from an earlier VQE Release 3.X to Release 3.5 and preserve your earlier VQE Release 3.X configurations.

Before performing an ISO full upgrade, perform the following tasks:

1. If you do not have an ISO software installation CD with VQE Release 3.5 software, see Downloading VQE Software from Cisco.com, page 23
2. Backing Up VQE Release 3.X Files Before Upgrading or Installing Software, page 25

Note *ISO full upgrades must be performed using the CDE110 serial port (not the CDE110 video and keyboard ports).* For these installations, the serial port connection can be through a terminal server or through a directly connected PC.

For terminal emulation software configuration, see "Configuring Terminal Emulation Software" in Chapter 2 of the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.

To perform an ISO full upgrade to upgrade from an earlier VQE Release 3.X to Release 3.5, do the following:

Caution An ISO full upgrade will format the hard disk on the CDE110. *Formatting causes all data on the hard disk to be erased.*

Be sure to backup configuration files as described in the "Backing Up VQE Release 3.X Files Before Upgrading or Installing Software" section on page 25.

Step 1 Insert the ISO software installation CD in the CDE110 CD/DVD Combo drive.

Step 2 Power on or power cycle the CDE110.

When the VQE installation software runs, the `boot:` prompt is displayed.

Step 3 Type upgrade and then press Enter. For example:

```
boot: upgrade
```

Note If you enter invalid input at the boot: prompt, the installer displays "Could not find kernel image" and your input.

This message is harmless. Enter correct input (upgrade) and proceed with the installation.

The installation software checks that VQE software and configuration files exist. If either of these checks fail, the installation is terminated.

If the VQE software and configuration files exist, the following message is displayed before the actual upgrade process starts.

```
You are performing VQE upgrade on hostname. It currently has Cisco VQE Server_or_Tools
Release xxxx installed. If this is incorrect, please power off the server within 60
seconds.
```

You can power off the server to stop the ISO full upgrade if the wrong CD has been used for the installation.

When you select an ISO full upgrade and the installation begins, no further user input is required or possible.

An ISO full upgrade does the following:

- Checks whether the /etc configuration files have been changed manually (without the use of the VCDB). If manual changes are detected, the ISO full upgrade installer does the following:
  - Logs the names of files that have been manually changed. The log file is /var/log/upgrade.log.
  - Writes **diff** command output showing the manually changed items into the /vqe-etc/etc-diff file.

Note If there are manually edited files in the existing /etc directories, the changes were made by an administrator without the use of VCDB. If you want to continue to have these differences present in your configuration files, you need to carefully edit the relevant configuration files so that they include the items that are different.

- Backs up the /etc configuration files to the vqe-*release-hostname-timestamp*.tar.gz file by creating a tar file archive of the following files: /vqe-etc/etc-diff, /var/log/upgrade.log and all files under /etc. Saves the tar file archive in a temporary set of files.
- Formats the hard drive.
- Installs the Linux operating system and add-on RPMs of VQE packages and configuration files.
- Restores (from the tar file archive) the following /etc configuration files that were present on your earlier VQE Release 3.X host:
  - On a VQE-S host, the VCDB configuration file (/etc/opt/vqes/vcdb.conf)
  - On a VQE-S host, the channel configuration file (/etc/opt/vqes/vqe_channels.cfg)
  - On a VQE Tools host, the channel configuration file (/etc/opt/vqes/vqec_channels.cfg) and all VCPT configuration files in /etc/opt/vcpt/data
  - On both VQE-S and VQE Tools hosts, all files in the /etc/opt/certs directory (files related to Secure Sockets Layer certificates)

Note Except for the preceding files, all other /etc configuration files from an earlier Release 3.X VQE host *are not copied* to the directories under /etc.

- Saves the other files shown in Table 4 to the CDE110 hard drive.

Table 4 ISO Full Upgrade: Other Saved Files

File in the Tar File Archive	Directory Location Where Saved
backed up /etc configuration files including vcdb.conf	/vqe-etc/etc-save/
upgrade.log file	/var/log/upgrade.log
diff command output (generated earlier) in the etc-diff file	/vqe-etc/etc-diff file
vqe-*release-hostname-timestamp*.tar.gz (tar file)	/vqe-etc/

- Performs installation post processing
  - Installs a new vcdb.conf.sample file in the /etc/opt/vqes/ directory.
  - Saves the factory default configuration files under /etc to the directory /vqe-etc/etc-pristine.
- Performs a final reboot. As part of the final reboot, runs the VQE Configuration Engine to apply the VCDB values (from earlier VQE Release 3.X vcdb.conf that was restored earlier) to the VQE 3.5 configuration files under /etc (including vcdb.conf).

Step 4 When the CDE110 completes the final reboot, you are required to log in as root and change the password for root:

```
localhost.localdomain login: root
You are required to change your password immediately (root enforced)

You can now choose the new password or passphrase.

A valid password should be a mix of upper and lower case letters,
digits, and other characters.  You can use an 8 character long
password with characters from at least 3 of these 4 classes, or
a 7 character long password containing characters from all the
classes.  An upper case letter that begins the password and a
digit that ends it do not count towards the number of character
classes used.

A passphrase should be of at least 3 words, 12 to 40 characters
long and contain enough different characters.


Enter new password:
Re-type new password:
```

Step 5 Enter the new password for root.

Step 6 Set the password for the vqe user ID.

Note No passwords are copied over to the new set of installed files.

Step 7 Check the /var/log/vqe/vqe.log file to ensure that no significant errors occurred during the ISO full upgrade.

Step 8 Remove the ISO software installation CD from the CDE110 CD/DVD Combo drive and close the drive tray.

Step 9 If you made changes to your earlier VQE Release 3.X /etc configuration parameters that are not now under the control of the VQE CMS, the ISO full upgrade does not preserve these changes in Release 3.5. It is possible for you to manually recreate the customized configurations in the Release 3.5 /etc configuration files. *However, making manual changes in this manner is not supported or recommended.*

You can examine the /vqe-etc/etc-diff file to determine the /etc file parameters (beyond the control of the VQE CMS) that have been changed.

VCPT configuration files and VQE-S and VQE-C channel configuration files from an earlier VQE Release 3.X can be used without modification with VQE Release 3.5.

Using an ISO Clean Installation to Install VQE Release 3.5 on an Earlier VQE Release 3.X System

This section explains how to use an ISO clean installation to install VQE Release 3.5 on an earlier VQE Release 3.X system.

Caution If you use an ISO clean installation for installing VQE Release 3.5, your previous VQE configurations will not be backed up or restored. Use an ISO clean installation only when there is no requirement to preserve previous VQE configuration values.

An ISO clean installation installs a complete new set of VQE, Linux, Quagga, and other files. An ISO clean installation *does not* backup or restore your current VQE 3.X configurations. An ISO clean installation reformats the hard drive and reinstalls the operating system and other packages, such as the VQE software. All old configurations are removed.

Before performing an ISO clean installation, perform the following tasks:

1. If you do not have an ISO software installation CD with VQE Release 3.2 software, see Downloading VQE Software from Cisco.com, page 23.
2. Backing Up VQE Release 3.X Files Before Upgrading or Installing Software, page 25

Note ISO clean installations must be performed using the CDE110 serial port (not the CDE110 video and keyboard ports). For these installations, the serial port connection can be through a terminal server or through a directly connected PC.

For terminal emulation software configuration, see “Configuring Terminal Emulation Software” in Chapter 2 of the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.

To perform an ISO clean installation to install VQE Release 3.5 on an earlier VQE Release 3.X system, do the following:

Caution An ISO clean installation will format the hard disk on the CDE110. Formatting causes all data on the hard disk to be erased.

Be sure to backup configuration files as described "Backing Up VQE Release 3.X Files Before Upgrading or Installing Software" section on page 25. With this backup of the configuration files, you will have the earlier VQE 3.X configuration files available for reference if you need them after the ISO clean installation is complete.

Step 1 Insert the ISO software installation CD in the CDE110 CD/DVD Combo drive.

Step 2 Power on or power cycle the CDE110.

When the VQE installation software runs, the `boot:` prompt is displayed.

Step 3 Type clean and then press Enter. For example:

```
boot: clean
```

Note If you enter invalid input at the boot: prompt, the installer displays "Could not find kernel image" and your input.

This message is harmless. Enter correct input (clean) and proceed with the installation.

When you select an ISO clean installation and the installation begins, no further user input is required or allowed until the initial configuration of the CDE110 server.

An ISO clean installation does the following:

1. Formats the hard disk.
2. Installs the Linux operating system and all packages.
3. Reboots.
4. Installs the add-on RPM of VQE packages and configuration files.
5. Performs installation post processing.
   a. Installs a new vcdb.conf.sample file in the /etc/opt/vqes/ directory.
   b. Saves the factory default configuration files under /etc to the directory /vqe-etc/etc-pristine.
6. Reboots the server.

Step 4 Remove the ISO CD from the CDE110 CD/DVD Combo drive and close the drive tray.

Step 5 When the CDE110 completes the final reboot, you are required to log in as root and change the password for root:

```
localhost.localdomain login: root
You are required to change your password immediately (root enforced)

You can now choose the new password or passphrase.

A valid password should be a mix of upper and lower case letters,
digits, and other characters.  You can use an 8 character long
password with characters from at least 3 of these 4 classes, or
a 7 character long password containing characters from all the
```

```
classes.  An upper case letter that begins the password and a
digit that ends it do not count towards the number of character
classes used.

A passphrase should be of at least 3 words, 12 to 40 characters
long and contain enough different characters.


Enter new password:
Re-type new password:
```

Step 6 Enter the new password for root.

When you change the root password, the VQE Startup Configuration Utility runs:

```
Welcome to the Cisco VQE startup configuration utility.  This utility is
intended to facilitate the initial setup of the VQE system.  This is not
intended as a complete configuration tool, but merely to assist in the most
common configuration needs, therefore you may still need to customize the VQE
configuration for your specific needs after this utility is complete.
```

The VQE Startup Configuration Utility allows you to specify initial configuration values for the CDE110 server and the VQE software. Using this input, the startup utility generates initial VQE Configuration Database (VCDB) contents and reboots the CDE110 server. When the server comes back up, VQE Configuration Engine applies the changes in VCDB to the configuration files under the /etc directory.

For information on using the startup utility, see Chapter 2, "Getting Started with the VQE Startup Configuration Utility" in the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5.*

For information on the VQE Configuration Database and Configuration Engine, see Chapter 7, "Configuring VQE Server and VQE Tools" in the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5.*

Terminal Client Software Behavior. When using the Cisco VQE Startup Configuration Utility with a CDE110 serial port connection and terminal client software, different terminal client facilities have varying behavior for the Backspace and Delete Keys:

- With console/konsole on Linux, or putty on Windows, pressing Backspace usually works correctly.
- With HyperTerminal on Windows, pressing Ctrl-Backspace usually works correctly.
- With HyperTerminal on Windows, pressing Backspace (without Ctrl) produces errors.
- With UNIX xterm shell, pressing Backspace produces errors. With the UNIX xterm shell, the Delete key (not Backspace) should be used to remove characters.

Other terminal client facilities may produce different behaviors for the Backspace and Delete keys.

Performing an ISO Clean or ISO Full Upgrade Installation from a Remote Location

Because of the cost and time delay, it is sometimes not desirable for the service-provider technician to be physically present at the CDE110 server when an ISO clean or ISO full upgrade installation is performed.

Starting with VQE Release 3.3.1, an ISO clean or ISO full upgrade installation can be performed from a remote location without inserting an ISO software installation CD into the CDE110 server. The remote ISO installation is available for both VQE Server and VQE Tools software.

The following sections explain how to perform a remote ISO software installation:

- Prerequisites and Restrictions for a Remote ISO Software Installation, page 33
- Remotely Performing an ISO Clean or ISO Full Upgrade Installation, page 34

Prerequisites and Restrictions for a Remote ISO Software Installation

Before proceeding, read and understand these sections on ISO clean and ISO full upgrade installations:

- ISO Clean Installation, page 22
- ISO Full Upgrade, page 23

To perform an ISO software installation from a remote location, the following prerequisites and requirements must be met for the CDE110 server on which the software will be installed:

- CDE110 server must have a factory-installed flash drive. Only CDE110 model numbers CDE111-2-146TXA-K9 and CDE111-2-146TXD-K9 have a factory-installed flash drive. If the CDE110 does not have the needed second drive (for example, flash drive), the installation software displays this error message:

```
ERROR: No second disk detected on CDE-111...
This could indicate a hardware failure.
Please contact Cisco Technical Support.
```

Note CDE110 model numbers CDE110-1-036TXA-K9 and CDE110-1-036TXD-K9 *do not* have a factory-installed flash drive. On these models, an ISO clean or ISO full upgrade installation from a remote location *is not possible*.

- CDE110 server must be running and have a functioning hard disk drive and flash drive.
- Remote access to the CDE110 server must be through the server serial port. Typically, remote access is through a terminal server connected to a serial port on the front or back of the Cisco CDE110. For terminal emulation software configuration, see “Configuring Terminal Emulation Software” in Chapter 2 of the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.
- There must be a mechanism to remotely power cycle the CDE110 server. This mechanism is needed to make sure that the technician can restart the installation process should the server become irresponsive during the installation.
- VQE software currently installed on the CDE110 server must be for VQE Release 3.3.1 or a later release. If the CDE110 does not have the needed VQE software release, the installation software displays an error message. For example:

```
ERROR: Remote ISO installation is not supported for Versions below 3.3
ISO Image Version : Cisco VQE Server Release 3.2.2 (Build 7)
```

Because the remote installation software is not present in VQE releases earlier than Release 3.3.1, the following restrictions apply to an ISO clean or ISO full upgrade installation from a remote location:

- If the software currently installed on the CDE110 server is for a VQE release earlier than Release 3.3.1, an ISO clean or ISO full upgrade installation from a remote location *is not possible*.
- Downgrade using an ISO clean installation from VQE Release 3.3.X to a version of VQE earlier than Release 3.3.1 *is not possible.*

However, you can remotely perform an ISO clean or ISO full upgrade installation *to upgrade* from VQE Release 3.3.X or 3.5.X to a later VQE release. For example, you can use a ISO clean or ISO full upgrade installation to upgrade from Release 3.3.2 or Release 3.5.1.

You can remotely perform an ISO clean installation *to downgrade* from VQE Release 3.3.X or 3.5.X to any earlier VQE 3.3.X or 3.5.X release. For example, a remote ISO clean installation from Release 3.5.1 to Release 3.3.2 is allowed. Be aware that using an ISO clean installation always removes all old configurations. An ISO full downgrade installation is not currently supported.

Remotely Performing an ISO Clean or ISO Full Upgrade Installation

The remote ISO installation script logs success and failure messages concerning the remote installation to its log file /var/log/vqe/remote_iso_install.log.

To perform an ISO clean or ISO full upgrade installation, do the following:

Step 1 Login to the remote CDE110 server on which the software will be installed.

Caution An ISO clean installation or ISO full upgrade installation will format the hard disk on the CDE110. *Formatting causes all data on the hard disk to be erased.*

Step 2 Backup files on the CDE110 server as described in the "Backing Up VQE Release 3.X Files Before Upgrading or Installing Software" section on page 25.

Caution To be safe in case of a catastrophic failure, be sure to backup configuration files as described "Backing Up VQE Release 3.X Files Before Upgrading or Installing Software" section on page 25.

Step 3 To copy the ISO software to the remote CDE110 server, use a facility such as NFS, FTP, or SCP. The network copy operation must be from a separate machine that can provide the ISO image file. The ISO software can be copied to any CDE110 directory, such as /tmp.

For information on downloading the ISO software, see the "Downloading VQE Software from Cisco.com" section on page 23.

Step 4 Run the remote installation script /usr/bin/vqe_remote_iso_install. For example:

```
[root@system]# /usr/bin/vqe_remote_iso_install
```

The network installation script prompts you for the following:

- Full pathname of the ISO software file
- Whether you want to perform an ISO clean installation or ISO full upgrade installation
- After you verify the installation options, whether you want to continue with the installation

Note For each prompt, the default (if any) is in brackets. Press **Enter** to accept the default.

At the end of the script, you are given an opportunity to press **Ctrl-C** to abort the installation.

The following example shows output from the script when an upgrade installation is selected.

```
This script will perform the remote iso installation on this server.

Please Enter Full Path of the ISO Image : /tmp/vqes-3.x.x-xx.xxx_xx.iso

Please enter the installation type : clean/[upgrade] : Enter

Setting up Second Disk for Remote ISO Installation... |  Done
```

```
Please validate the installation options and enter "y" at prompt to proceed
NOTE: Server will be REBOOTED if you choose to proceed with the installation

Install Type         : upgrade
Current Version      : Cisco VQE Server Release 3.3.X (Build XX)
Post-Install Version : Cisco VQE Server Release 3.3.X (Build XX)
Install Setup Log    : /var/log/vqe/remote_iso_install.log

Do you want to proceed with the installation? y/[n]: y

Proceeding with upgrade install...

Logfile for Remote Installation Setup will be available after installation
at : /var/log/vqe/remote_iso_install.log


Setting up filesystems for remote iso install... \  Done

Rebooting Server in 5 seconds to start Remote ISO Installation...
Press CTRL-C if you want to abort now.


Broadcast message from root (pts/0) (Sun Mar 29 22:05:38 2009):

The system is going down for reboot NOW!
```

Step 5 When the CDE110 reboots, the ISO clean installation or ISO full upgrade installation begins. Depending on the type of installation you are performing, go to one of the following sections:

- For an ISO clean installation, go to the procedure in the next section, "Remotely Performing an ISO Clean Installation" section on page 35.
- For an ISO full upgrade installation, go to the procedure in the "Remotely Performing an ISO Full Upgrade Installation" section on page 36.

Remotely Performing an ISO Clean Installation

(Continued from Step 5 in the preceding section)

When the ISO clean installation begins, no further user input is required or allowed until the initial configuration of the CDE110 server.

An ISO clean installation does the following:

1. Formats the hard disk.
2. Installs the Linux operating system and all packages.
3. Reboots.
4. Installs the add-on RPM of VQE packages and configuration files.
5. Performs installation post processing.
   a. Installs a new vcdb.conf.sample file in the /etc/opt/vqes/ directory.
   b. Saves the factory default configuration files under /etc to the directory /vqe-etc/etc-pristine.
6. Reboots the server.

Step 1 When the CDE110 completes the final reboot, you are required to log in as root and change the password for root:

```
localhost.localdomain login: root
You are required to change your password immediately (root enforced)
```

```
You can now choose the new password or passphrase.

A valid password should be a mix of upper and lower case letters,
digits, and other characters.  You can use an 8 character long
password with characters from at least 3 of these 4 classes, or
a 7 character long password containing characters from all the
classes.  An upper case letter that begins the password and a
digit that ends it do not count towards the number of character
classes used.

A passphrase should be of at least 3 words, 12 to 40 characters
long and contain enough different characters.


Enter new password:
Re-type new password:
```

Step 2 Enter the new password for root.

When you change the root password, the VQE Startup Configuration Utility runs:

```
Welcome to the Cisco VQE startup configuration utility.  This utility is
intended to facilitate the initial setup of the VQE system.  This is not
intended as a complete configuration tool, but merely to assist in the most
common configuration needs, therefore you may still need to customize the VQE
configuration for your specific needs after this utility is complete.
```

The VQE Startup Configuration Utility allows you to specify initial configuration values for the CDE110 server and the VQE software. Using this input, the startup utility generates initial VQE Configuration Database (VCDB) contents and reboots the CDE110 server. When the server comes back up, VQE Configuration Engine applies the changes in VCDB to the configuration files under the /etc directory.

For information on using the startup utility, see Chapter 2, “Getting Started with the VQE Startup Configuration Utility” in the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.

For information on the VQE Configuration Database and Configuration Engine, see Chapter 6, “Configuring VQE Server and VQE Tools” in the *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*.

Terminal Client Software Behavior. When using the Cisco VQE Startup Configuration Utility with a CDE110 serial port connection and terminal client software, different terminal client facilities have varying behavior for the Backspace and Delete Keys:

- With console/konsole on Linux, or putty on Windows, pressing Backspace usually works correctly.
- With HyperTerminal on Windows, pressing Ctrl-Backspace usually works correctly.
- With HyperTerminal on Windows, pressing Backspace (without Ctrl) produces errors.
- With UNIX xterm shell, pressing Backspace produces errors. With the UNIX xterm shell, the Delete key (not Backspace) should be used to remove characters.

Other terminal client facilities may produce different behaviors for the Backspace and Delete keys.

Remotely Performing an ISO Full Upgrade Installation

(Continued from Step 5 in the “Remotely Performing an ISO Clean or ISO Full Upgrade Installation” section on page 34)

The ISO full upgrade installation software checks that VQE software and configuration files exist. If either of these checks fail, the installation is terminated.

If the VQE software and configuration files exist, the following message is displayed before the actual upgrade process starts.

```
You are performing VQE upgrade on hostname. It currently has Cisco VQE Server_or_Tools
Release xxx installed. If this is incorrect, please power off the server within 60
seconds.
```

When you select an ISO full upgrade and the installation begins, no further user input is required or possible.

An ISO full upgrade does the following:

- Checks whether the /etc configuration files have been changed manually (without the use of the VCDB). If manual changes are detected, the ISO full upgrade installer does the following:
  - Logs the names of files that have been manually changed. The log file is /var/log/upgrade.log.
  - Writes **diff** command output showing the manually changed items into the /vqe-etc/etc-diff file.

Note If there are manually edited files in the existing /etc directories, the changes were made by an administrator without the use of VCDB. If you want to continue to have these differences present in your configuration files, you need to carefully edit the relevant configuration files so that they include the items that are different.

- Backs up the /etc configuration files to the vqe-*release-hostname-timestamp*.tar.gz file by creating a tar file archive of the following files: /vqe-etc/etc-diff, /var/log/upgrade.log and all files under /etc. Saves the tar file archive in a temporary set of files.
- Formats the hard drive.
- Installs the Linux operating system and add-on RPMs of VQE packages and configuration files.
- Restores (from the tar file archive) the following /etc configuration files that were used for the earlier VQE Release:
  - On a VQE-S host, the VCDB configuration file (/etc/opt/vqes/vcdb.conf)
  - On a VQE-S host, the channel configuration file (/etc/opt/vqes/vqe_channels.cfg)
  - On a VQE Tools host, the channel configuration file (/etc/opt/vqes/vqec_channels.cfg) and all VCPT configuration files in /etc/opt/vcpt/data
  - On both VQE-S and VQE Tools hosts, all files in the /etc/opt/certs directory (files related to Secure Sockets Layer certificates)

Note Except for the preceding files, all other /etc configuration files from the earlier VQE Release *are not copied* to the directories under /etc.

- Saves the other files shown in Table 4 to the CDE110 hard drive.

Table 5 ISO Full Upgrade: Other Saved Files

File in the Tar File Archive	Directory Location Where Saved
backed up /etc configuration files including vcdb.conf	/vqe-etc/etc-save/
upgrade.log file	/var/log/upgrade.log

Table 5 ISO Full Upgrade: Other Saved Files (continued)

File in the Tar File Archive	Directory Location Where Saved
diff command output (generated earlier) in the etc-diff file	/vqe-etc/etc-diff file
vqe-*release-hostname-timestamp*.tar.gz (tar file)	/vqe-etc/

- Performs installation post processing
  - Installs a new vcdb.conf.sample file in the /etc/opt/vqes/ directory.
  - Saves the factory default configuration files under /etc to the directory /vqe-etc/etc-pristine.
- Performs a final reboot. As part of the final reboot, runs the VQE Configuration Engine to apply the VCDB values (from earlier VQE release vcdb.conf that was restored) to the new VQE configuration files under /etc (including vcdb.conf).

Step 1 When the CDE110 completes the final reboot, you are required to log in as root and change the password for root:

```
localhost.localdomain login: root
You are required to change your password immediately (root enforced)

You can now choose the new password or passphrase.

A valid password should be a mix of upper and lower case letters,
digits, and other characters.  You can use an 8 character long
password with characters from at least 3 of these 4 classes, or
a 7 character long password containing characters from all the
classes.  An upper case letter that begins the password and a
digit that ends it do not count towards the number of character
classes used.

A passphrase should be of at least 3 words, 12 to 40 characters
long and contain enough different characters.


Enter new password:
Re-type new password:
```

Step 2 Enter the new password for root.

Step 3 Set the password for the vqe user ID.

Note No passwords are copied over to the new set of installed files.

Step 4 Check the /var/log/vqe/vqe.log file to ensure that no significant errors occurred during the ISO full upgrade.

Step 5 If you made changes to earlier VQE Release /etc configuration parameters that are not now under the control of the VQE CMS, the ISO full upgrade does not preserve these changes in new VQE Release. It is possible for you to manually recreate the customized configurations in the new VQE Release /etc configuration files. *However, making manual changes in this manner is not supported or recommended.*

You can examine the /vqe-etc/etc-diff file to determine the /etc file parameters (beyond the control of the VQE CMS) that have been changed.

Supporting Software Hardening Guides and VQE

Customers who wish to apply the security recommendations published by SysAdmin, Audit, Network, Security Institute (SANS) or National Security Agency (NSA), as described in the documents referenced in the following sections, should be aware of some issues in using these recommendations that may affect the correct operation of the VQE-S.

The following sections describe the particular areas where customers should exercise care in following the security recommendations in these hardening guides:

- Linux Security Checklist, page 39
- The 60 Minute Network Security Guide, page 39

Linux Security Checklist

Document: *Linux Security Checklist,* Version 2

Document URL:

http://www.sans.org/score/checklists/linuxchecklist.pdf

For the Linux operating system, the following are SANS requirements where it appears that if the user were to follow the specific recommendations of the guide it would likely break behavior that VQE implements.

- Page 2, item 2: “System Patches”. Customers should obtain all system patches through Cisco support, and not directly from RedHat. Cisco will provide timely patches and notifications to customers to address security concerns that may arise within the components of the linux distribution.
- Page 3, item 3: “Disabling Unnecessary Services”. All unnecessary services have been disabled on the shipped product. VQE customers should not normally need to disable any of the services that are enabled by default after the product is installed.
- Page 3, item 5: “Default Password Policy”. The default password settings for the VQE-S are set in /etc/pam.d/system-auth-ac rather than in /etc/login.defs See 'man pam_passwdqc' for more information.
- Page 7, item 13: “System Logging”. The VQE-S includes a modified version of syslogd, which is customized in order to support certain VQE-S functions. VQE customers must therefore not replace syslog with syslog-ng, as suggested in this item.
- Page 11, item 20: “Selinux”. Selinux functionality is disabled on the VQE-S in its factory configuration, and it should not be enabled. Enabling the Selinux functions on the VQE-S may have unexpected consequences.

The 60 Minute Network Security Guide

The NSA’s *The 60 Minute Network Security Guide* has guidance relevant to the Apache web server and the VQE Server software.

Document: *The 60 Minute Network Security Guide*, Version 2.1

Document URL: http://www.nsa.gov/ia/_files/support/I33-011R-2006.pdf

If VQE customers follow instructions in the "Unix Web Servers" section of *The 60 Minute Network Security Guide*, it will not break the VQE web application system.

The following guidance applies to VQE Server software except for the Apache web server, which was discussed in the preceding paragraph.

- Page 10 and 40: “Follow The Concept Of Least Privilege”. This section recommends reducing the privileges of common system utilities such as configuration tools and script interpreters. Some of these utilities may be used by the VQE-S software and their permissions should not be modified.
- Page 35, item 2: “Services and Port”. All unnecessary services have been disabled on the shipped product. VQE customers should not normally need to disable any of the services that are enabled by default after the product is installed.
- Page 36, item 2: “Permissions”. Some VQE-S services require SUID/SGID permissions. The permissions of these files, along with every other VQE-S related file, should not be modified.
- Page 37, “Core Dumps”. The VQE-S stores crash related information in the core dump files. By removing the core file, valuable debugging information is discarded. Settings related to the creation and storage of core dumps should not be modified. Additionally, core dumps should only be removed after consultation with your Cisco Technical Support Contact.
- Page 39, “Logs”. The VQE-S uses a customized version of syslogd in order to log VQE related messages. Using a remote host to log syslog messages from the VQE-S is not supported at this time.
- Page 39, “Chroot Environment”. The VQE-S application requires a specific level of permissions and should not be set to run in a chroot environment.

Notices

The document *Open Source Used in Visual Quality Experience 3.5.5* contains licenses and related license information for open-source software included in VQE, Releases 3.5.5, 3.5.6, 3.5.7, 3.5.8, and 3.5.9. The document is located at the following URL:

http://www.cisco.com/en/US/products/ps7127/products_licensing_information_listing.html

If you have any questions or problems accessing the link, contact: spvtg-external-opensource-requests@cisco.com.

Related Documentation

Refer to the following documents for additional information about Cisco VQE and the Cisco CDE110 appliance:

- *Cisco CDA Visual Quality Experience Application User Guide, Release 3.5*

  http://www.cisco.com/en/US/docs/video/cds/cda/vqe/3_5/user/guide/vqe_guide3_5.html
- *Cisco CDA Visual Quality Experience Client System Configuration Guide*

  http://www.cisco.com/en/US/docs/video/cds/cda/vqe/vqec/configuration/guide/vqec_cnfg.html
- *Cisco Content Delivery Engine 110 Hardware Installation Guide*

  http://www.cisco.com/en/US/docs/video/cds/cde/cde110/installation/guide/cde110_install.html
- *Regulatory Compliance and Safety Information for the Cisco Content Delivery Engine 110*

  http://www.cisco.com/en/US/docs/video/cds/cde/regulatory/compliance/cde110_rcsi.pdf
- *Open Source Used in Visual Quality Experience 3.5.5*

  http://www.cisco.com/en/US/products/ps7127/products_licensing_information_listing.html

The entire Content Delivery Systems documentation suite is available on Cisco.com at:

http://www.cisco.com/en/US/products/ps7191/Products_Sub_Category_Home.html

The VQE Client (VQE-C) documentation is included in the VQE-C software TAR file. If you are a registered Cisco.com user, the file can be downloaded from the following location:

http://tools.cisco.com/support/downloads/pub/Redirect.x?mdfid=280836689

Table 6 lists the VQE Client documentation that is provided.

Table 6 VQE Client Documentation

VQE-C Document	Description
VQE-C Release Notes	Provides release-specific information for VQE-C.
VQE-C System Integration Reference	Provides information on VQE-C components, architecture, integration, and APIs. Also includes a VQE-C quick-start guide.
Cisco CDA Visual Quality Experience Client System Configuration Guide *	Explains certain factors to consider when configuring and deploying VQE-C. Also provides reference information on the VQE-C configuration file parameters.
VQE-C CLI Command Reference	Provides reference information on the VQE-C command-line interface.

* This document is available only on Cisco.com. See the list of URLs preceding this table.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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