



VQE Server Performance and Scaling Limits

This appendix summarizes performance information of the Cisco CDE110, CDE111 and CDE250 platforms hosting the Cisco VQE Server (VQE-S), and provides information on how to access VQE-S capacity statistics. The information is for general deployment estimates only and may vary according to network designs.

Ingress and Egress Bandwidth Limits

[Table H-1](#) presents ingress and egress bandwidth limits for all Cisco VQE releases of the CDE110 platform hosting the VQE-S.

Table H-1 Ingress and Egress Bandwidth Limits of the CDE110 Platform hosting the VQE-S

Version	Ingress Maximum Bandwidth (Gbps)	Egress Maximum Bandwidth (Gbps)	Combined Egress and Ingress Maximum Bandwidth (Gbps)
Cisco VQE Release 2.1	1.0	1.0	2.0
Cisco VQE Release 3.0	1.0	1.5	2.5
Cisco VQE Release 3.1	1.0	2.0	3.0
Cisco VQE Release 3.2	1.0	2.0	3.0
Cisco VQE Release 3.3	1.0	2.0	3.0
Cisco VQE Release 3.4	1.0	2.0	3.0
Cisco VQE Release 3.5	1.0	2.0	3.0
Cisco VQE Release 3.6	1.0	2.0	3.0

[Table H-2](#) presents ingress and egress bandwidth limits for all VQE releases of the CDE111 platform hosting the VQE-S.

Table H-2 *Ingress and Egress Bandwidth Limits of the CDE111 Platform hosting the VQE-S*

Version	Ingress Maximum Bandwidth (Gbps)	Egress Maximum Bandwidth (Gbps)	Combined Egress and Ingress Maximum Bandwidth (Gbps)
Cisco VQE Release 3.2	1.0	3.0	4.0
Cisco VQE Release 3.3	1.0	3.0	4.0
Cisco VQE Release 3.4	2.0	3.0	4.0
Cisco VQE Release 3.5	2.0	3.0	4.0
Cisco VQE Release 3.6	2.0	3.0	4.0

As shown in [Table H-2](#), in Cisco VQE Release 3.4 and later releases, the maximum ingress bandwidth on the CDE111 platform hosting the VQE-S is up to 2 Gbps, and the maximum egress bandwidth is up to 3 Gbps. The combination of ingress and egress bandwidth cannot exceed 4 Gbps. For example, if 1 Gbps of ingress bandwidth is used, up to 3 Gbps of egress bandwidth may be used. Similarly, if 2 Gbps of ingress bandwidth are used, up to 2 Gbps of egress bandwidth may be used.

[Table H-3](#) presents ingress and egress bandwidth limits for all Cisco VQE releases of the CDE250 platform hosting the VQE-S.

Table H-3 *Ingress and Egress Bandwidth Limits of the CDE250 Platform hosting the VQE-S*

Version	Ingress Maximum Bandwidth (Gbps)	Egress Maximum Bandwidth (Gbps)	Combined Egress and Ingress Maximum Bandwidth (Gbps)
Cisco VQE Release 3.6	3.0	9.0	12.0
Cisco VQE Release 3.7	4.0 (5.0 if possible)	9.0	13.0 (14.0 if possible)

**Note**

In Cisco VQE Release 3.7, since the system always allocates the bandwidth for the ingest first and utilizes all the bandwidth for the channel lineup, the input channel lineup aggregate bandwidth should not exceed the 4Gbps limit as it may affect the bandwidth required for the RCC request from the STB clients.

Scaling and Performance Summary

[Table H-4](#) presents scaling and performance summary for all releases of the CDE110 and CDE111 platforms hosting the VQE-S.

Table H-4 *Scaling and Performance Summary of the CDE110 and CDE111 Platforms hosting the VQE-S across all Releases*

Scale Factor	Maximum Value across all Cisco VQE Releases
Maximum number of Unicast Retransmission Repair Requests (NACKs) input per second.	10,000 bitmaps resulting in a maximum of 50,000 RTP ¹ packets

Table H-4 *Scaling and Performance Summary of the CDE110 and CDE111 Platforms hosting the VQE-S across all Releases (continued)*

Maximum Unicast Retransmission Rate—packets output per second.	50,000
Maximum Number of Ingest Channels—This is subject to an additional constraint of platform ingest limits.	500 channels or the maximum ingest bandwidth in Gbps, whichever limit is reached first.
Maximum Number of Simultaneous Client Subscribers—Subscriber is defined as a consumer of video channel data. For a STB ² with multiple tuners (such as a watch one, record one capable STB), the VQE-S counts this as 2 subscribers.	32,000

1. RTP = Real-time Transport Protocol.

2. STB = set-top box.

[Table H-5](#) presents scaling and performance summary for all releases of the CDE250 platforms hosting the VQE-S.

Table H-5 *Scaling and Performance Summary of the CDE250 Platforms hosting the VQE-S across all Releases*

Scale Factor	Maximum Value across all Cisco VQE Releases
Maximum number of Unicast Retransmission Repair Requests (NACKs) input per second.	30,000 bitmaps resulting in a maximum of 150,000 RTP ¹ packets
Maximum Unicast Retransmission Rate—packets output per second.	150,000
Maximum Number of Ingest Channels—This is subject to an additional constraint of platform ingest limits.	1,000 channels or the maximum ingest bandwidth in Gbps, whichever limit is reached first.
Maximum Number of Simultaneous Client Subscribers—Subscriber is defined as a consumer of video channel data. For a STB ² with multiple tuners (such as a watch one, record one capable STB), the VQE-S counts this as 2 subscribers.	128,000
Server Cache Depth, the caching time of input multicast streams to service the RCC request from the STB clients	In Release 3.7, this value has been increased from 5 secs to 10 secs

1. RTP = Real-time Transport Protocol.

2. STB = set-top box.

The VQE-S separates the bandwidth resources that are dedicated to Unicast Retransmission and Rapid Channel Change (RCC). A VQE-S configuration parameter (`vqe.vqes.reserved_er_bw`) controls the bandwidth resources that are dedicated to Unicast Retransmission. The parameter allows the amount of resources dedicated to Unicast Retransmission to be reduced so that the resources are available for RCC instead. For information on this parameter, see [Table A-2 on page A-5 of Appendix A, “VQE, System and Network Parameters.”](#)

**Note**

VQE licenses for Unicast Retransmission and RCC are sold separately per STB. Software licenses for Unicast Retransmission and RCC are sold separately from the hardware.

**Note**

Each scaling limit is applied separately and all scaling limits must be met for proper service. Exceeding any of the scaling limits causes service to be denied.

VQE-S Capacity Statistics

The VQE-S Application Monitoring Tool (AMT) displays several counters and statistics under **Capacity Statistics** on the **Statistics** tab of the **Error Repair and RCC Configuration** window which together indicate whether the Unicast Retransmission, RCC, or client subscriber capacity limits, presented in the [Scaling and Performance Summary](#) section, have been exceeded. For information on the capacity statistics, see the [“Viewing Error Repair and RCC Configuration”](#) section on page 4-16.

**Note**

The capacity statistics indicate when VQE services have been refused due to a capacity limit being reached. The capacity statistics provide no advanced warning of capacity limits being reached, nor do they provide an indication of when additional server capacity is required.