5.2.7 VIDEO TELECONFERENCING SERVICE (VTS) (L.34.1.5.4, M.2.1.4)

Qwest's Networx Video Teleconferencing Service is a comprehensive, domestic and global solution to Agency needs and is supported by multiple Network Operations Centers with maximum reliability and availability.

Qwest's Video Teleconferencing Service (VTS) provides comprehensive end-to-end video solutions and will allow Agencies to schedule and participate in video teleconferences globally, simulating face-to-face interaction and increasing their ability to collaborate, regardless of their location.

Figure 5.2.7-1 provides an easy reference to correlate narrative requirements to our proposal response.

Figure 5.2.7-1 Responses to Narrative Mandatory Service Requirements

Req_ID	RFP Section	Proposal Response
32525	C.2.8.1.1.4 (5)	5.2.7.3.3
32526	C.2.8.1.1.4 (6)	5.2.7.3.3
32548	C.2.8.1.1.4 (13) (f)	5.2.7.3.3
32567	C.2.8.1.1.4 (17)	5.2.7.3.3
32577	C.2.8.1.2.1 (2)	5.2.7.3.3

5.2.7.1 Reserved (L.34.1.5.4 (a))

5.2.7.2 Reserved (L.34.1.5.4 (b))

5.2.7.3 Satisfaction of Video Teleconferencing Service Requirements (L.34.1.5.4 (c))

Qwest's VTS offering provides a robust offering of capabilities, features, and interfaces to Agencies [redacted]

[redacted]

.2.7.3.1 Satisfaction of VTS Capabilities Requirements L.34.1.5.4 (c), C.2.8.1.1.4)

Figure 5.2.7-3 summarizes apabilities requirements of Qwest's VTS service. Qwest fully omplies with all mandatory tipulated and narrative capabilities equirements for VTS. The text in Figure 5.2.7-3 provides the technical description required per L.34.1.5.4(c) and does not limit or caveat Qwest's compliance in any way.

Figure 5.2.7-3. VTS Capabilities. *Qwest's VTS capabilities simplify user access and ensure compliant or better performance for Agencies.*

ID	Capability	[redacted]
1	The contractor shall allow participants at different physical locations to simulate in-person meetings and conduct interactive dialogue using point-to-point and point-to-multi-point video teleconferencing arrangements.	[redacted]
2	The contractor shall support two-way video, one-way video with interactive voice, and/or the instant sharing of various types of documents/data files among VTS participants as an adjunct to the video teleconferencing session.	
3	The contractor shall support document sharing (data conferencing), which enables conference participants to interactively	

ID	Capability	[redacted]
	view, edit, and share or transfer data files and documents.	
4	The contractor shall provide an audio conference add-on capability to support non-video conference participants in a VTS call.	
5	Agencies may require videoconferencing capabilities between different types of videoconferencing equipment and networks (e.g., circuit switched, IP packet switched and private line). The contractor shall supply gateways, gatekeepers, multi-point bridges, or other interfaces to enable for VTS between dissimilar interfaces or networks.	
6	The contractor shall provide teleconferencing bridge capabilities, including providing IP packet switched bridging services for multiple IP VTS devices.	
7	The contractor shall support the following modes of operation: a. The contractor shall support dial-out mode: A centralized arrangement where the conference bridge operator initiates a call and dials each participant at least 15 minutes prior to the conference start time. b. The contractor shall support Meet Me (dial-in) mode. Each participant is responsible for individually initiating a call and dialing into the conference bridge. c. The contractor shall support Mixed Dial mode, providing the capability of supporting a combination or mix of both dial-out and meet me (dial-in) callers.	
8	The contractor shall provide the capability for VTS users to request operator assistance to resolve technical issues.	

ID	Capability	[redacted]
		[redacted]
9	The VTS shall maintain synchronization between the audio and video signals within + 2 video frames to the extent possible with the video frame rate employed in the video teleconference.	
10	The contractor shall allow users to establish a point-to-point VTS on demand without a reservation. Point-to-point VTS shall include full-duplex video, audio, and ancillary data transmission between participating locations.	
11	The contractor shall provide VTS multi-point arrangements in conjunction with the contractor's VTS reservation system. The multi-point arrangement shall have the capability of simultaneously providing VTS to users of a different Networx contractor's network and to users of public or other private networks. During a multi-point conference, the addition of a party to, or the deletion of a party from, the conference shall be indicated by a tone or by a verbal or visual announcement.	
12	The contractor shall provide multi-point arrangements with the following capabilities: a. Voice Activation. The video signal transmitted to all VTS conference call locations is automatically switched by voice activation when the speaker's audio signal exceeds a preset level for a specified amount of time.	

ID	Capability	[redacted]
	b. Continuous Presence. Multiple VTS locations may be viewed simultaneously on the same video screen. If the number of locations participating in the video conference exceeds the number being viewed via continuous presence, the selection of the video from a participating location that is displayed would be coordinated among the contractor and the participants. c. Chairperson Control. The chairperson in control of the VTS sends his or her own video or selects a return video from one of the participating locations to be sent to all participating locations. The chairperson has the capability of transferring control of the video teleconference to another presenter at his or her location. d. Lecture Control (Broadcast Video with Audio Return). The video from the lecturer's location is transmitted to all VTS participants. Audio, but no video, is returned to the lecturer's location from all other participating locations. The lecturer can select one or all of the audio signals for transmission to all participants.	[redacted]
13	The contractor shall provide access to a secure central reservation system to permit authorized VTS users to schedule multi-point video teleconferences. For point-to-point conferences, reservations shall be required only when coding conversion, format conversion, or rate adaptation features are needed, or for locations on a private network without off-net connectivity. The contractor's reservation system shall provide the following capabilities: a. Schedule a multi-point or point-to-point VTS conference within 30 minutes after the advance reservation request, and to schedule a VTS conference up to one year in advance by voice, fax, or electronic means. b. The contractor shall permit VTS users to cancel a video teleconference prior to the scheduled start time of the video teleconference. c. Based on availability of bridging capacity and required network functions, request a delay in the scheduled termination time of a VTS conference, which is already in progress, shall be granted if the request is made at least 20 minutes before the scheduled terminating time of the VTS. d. The contractor shall provide the ability for VTS authorized users to schedule one or more video teleconferences by time and day of week either as a single event or recurring event on a daily, weekly, monthly	[redacted]

ID	Capability	[redacted]
	or other periodic basis. e. The contractor shall allow users with operating at different (disparate) data rates/speeds to connect and conference at their preferred speed. f. The contractor shall describe the maximum conferencing capacity for VTS. This includes the contractor's total overall VTS conferencing capability and the maximum number of endpoints that can participate in a single VTS multi-point conference operating at 384 Kbps. g. The contractor shall provide the ability to add participants or join a conference. h. The contractor shall provide the ability for the VTS users to schedule a “meet-me” reservation-based video teleconference. i. The contractor shall provide the ability to obtain reservation information, only for their specific account, including all available unscheduled time slots by day, week, and month. j. The contractor shall provide the ability to retrieve VTS reports and account information.	[redacted]

ID	Capability	[redacted]
		[redacted]
14	The contractor shall provide a video format conversion capability that permits operation between the following: a. CODECs that operate in the NTSC video format and CODECs that operate in the Phase Alternation by Line (PAL) video format. b. CODECs that operate in the NTSC video format and CODECs that operate in the Système Electronique Couleur Avec Memoire (SECAM) video format. This is applicable when the contractor is providing the CODEC functionality.	[redacted]
15	The contractor shall deliver the following digital performance: a. When the contractor furnishes only a reservation, coding conversion, format conversion, and/or rate adaptation feature(s), the encoded audio, video, and ancillary data signals that the contractor delivers as part of VTS shall be in conformance with the signals required by the user's CODEC. b. When the contractor furnishes the encoding/decoding function, the digital performance shall be in conformance with FTR 1080 performance at the data rate employed in the VTS.	[redacted]
16	The contractor shall provide VTS to any of the following service delivery points: a. When the VTS uses dedicated private line access [optional], the service shall be delivered directly to one of the following: (i) Government furnished inverse	[redacted]

ID	Capability	[redacted]
	multiplexer. (ii) Government furnished CODEC. The contractor shall provide the service to the CODEC with or without the inverse multiplexing function according to the User-to-Network Interface (UNI) specified. (iii) Government furnished audio, video, and ancillary data source(s) inputs and outputs (e.g., cameras, speakers, microphones, and data ports) of the CODEC that interfaces with the video teleconferencing equipment. The contractor shall provide the encoding/decoding function with or without the inverse multiplexing function according to the UNI specified. b. When the VTS uses circuit switched ISDN or a private line, service shall be delivered directly to one of the following [Optional]: (i) Government furnished CODEC. (ii) Government furnished audio, video, and ancillary data source(s) inputs and outputs of the CODEC that interface with the video teleconferencing equipment. The contractor shall provide the encoding decoding function. (iii) Contractor-furnished teleconferencing equipment and CODEC. c. When the VTS uses IP communications, it shall support video communications devices that use the following protocols: (i) ITU-T H.323 signaling protocol. (ii) Session Initiation Protocol (SIP) Internet Engineering Task Force RFC 3261 for IP-based multimedia communications with specific media control extensions to the SIP protocol when available commercially. [Optional] d. VTS for a desktop configuration shall support computer systems operating under Microsoft Windows 2K/NT or higher operating systems, including the most current commercially available MS operating system.	[redacted]
17	The VTS shall have the capability to traverse and successfully interoperate with Agency firewalls and security layers. The contractor shall verify with the Agency that the Agency firewall is compatible with this service.	[redacted]
18	At a minimum, the contractor shall provide VTS summary and usage reports as described below. The contractor shall also make available any reports that are available to its commercial customer base.	[redacted]

ID	Capability	[redacted]
	a. Number and identification of video teleconferences scheduled using the reservation feature for the calendar month. b. Number and identification of video teleconferences per month that did not start at the scheduled time, the cause of which was attributable to the contractor's actions. c. Number and identification of video teleconferences per month that were started but then failed or suffered degraded quality due to the fault of the VTS contractor. d. A directory of all locations authorized to use the VTS reservation system. e. A history of reservation confirmation and cancellation notices within the reporting period. f. Report on cause of unexpected VTS disconnects or non-connects.	[redacted]

5.2.7.3.2 Satisfaction of VTS Features Requirements (L.34.1.5.4(c), C.2.8.1.2)

Figure 5.2.7-4 provides a comprehensive overview of Qwest's VTS features and technical advantages. Qwest fully complies with all mandatory stipulated and narrative features requirements for VTS. The text in Figure 5.2.7-4 provides the technical description required per L.34.1.5.4 (c) and does not limit or caveat Qwest's compliance in any way.

Figure 5.2.7-4 Qwest's VTS Features

ID	Name of Feature	Description	[redacted]
1	Attended Service	Contractor shall provide call monitoring, roll call, and coordination for a VTS conference. The contractor shall greet and introduce each VTS participant. The contractor shall verify proper conference operations prior to and during the conference to help ensure a successful VTS session.	[redacted]

ID	Name of Feature	Description	[redacted]
2	Certification	The contractor shall provide pre-testing, registration, and certification that Agency-owned equipment operates and is compatible with the contractor's VTS. In the event that the equipment is not certified, the contractor will notify the Agency of the deficiency and required changes to be operable with VTS.	[redacted]
3	Coding Conversion (Transcoding)	The contractor shall provide transcoding that is compliant with FTR 1080 formats. [Optional] The contractor shall provide a coding conversion capability that permits operation between CODECs, all of which use the NTSC video format, but none of which supports the FTR 1080 standard and none of which uses the same encoding/decoding algorithm(s). At a minimum, the contractor shall support the following compression algorithms as needed by the Agency: SG3/SG4, CTX, and CTX+. [Optional] The contractor shall provide a coding conversion capability that permits operation between CODECs, all of which use the NTSC video format, in which one or more of the CODECs support the FTR 1080 and in which one or more of the CODECs do not support the FTR 1080. At a minimum, the contractor shall support the following compression algorithms as needed by the Agency: SG3/SG4, CTX, and CTX+.	[redacted]
4	Rate Adaptation	The contractor shall provide a data rate adaptation capability to ensure that all VTS locations participating in a video teleconference can interconnect with each at dissimilar data rates.	[redacted]
5	Security – Sensitive but Unclassified (SBU)	The contractor shall provide transparent and secure VTS communications paths to support SBU video communications. The security capabilities are described in the	[redacted]

ID	Name of Feature	Description	[redacted]
		FTR1080 recommendation.	[redacted]
6	Security-Classified [Optional]	The contractor shall provide transparent and secure VTS communications paths and support video information that is categorized as classified (National Security Agency type 1 encryption) video communications. The security capabilities are described in the FTR1080 recommendation.	[redacted]

5.2.7.3.3 Satisfaction of VTS Interfaces Requirements (L.34.1.5.4 (c)), (C.2.8.1.3)

Figure 5.2.7-5 provides an overview of the various interfaces Qwest's VTS requires for access and use by Agencies. These interfaces are standards based and thus are compatible with a wide range of current, emerging, and legacy systems assets in place throughout the Government. Qwest fully complies with all mandatory stipulated and narrative interfaces requirements for VTS. The text in Figure 5.2.7-5 provides the technical description required per L.34.1.5.4 (c) and does not limit or caveat Qwest's compliance in any way.

Figure 5.2.7-5. VTS Interfaces. *By meeting both domestic and international physical and electrical interface standards, Qwest's VTS simplifies user access and ensures compliant or better performance for Agencies.*

UNI Type	Interface Type and Standard	Payload Data Rate or Bandwidth	Signaling Type	[redacted]
1 [Optional]	Digital Line: ISDN (BRI) S and T Reference Point (Std: (ANSI) T1.607 and 610)	Up to 128 Kbps (2x64 Kbps) and multi-rate DS-0's (px64)	(ITU-TSS) Q.931	[redacted]
2 [Optional]	Digital Trunk: (T1) (Std: Telcordia SR-TSV-002275 and ANSI T1.102/107/403)	Up to 1.536 Mbps	T1 Robbed-Bit Signaling	
3 [Optional]	Digital Trunk: ISDN (PRI) T Reference Point (Std: ANSI T1.607 and 610)	Up to 1.536 Mbps	ITU-TSS Q.931	
4 (Non Domestic/ (OCONUS) [Optional]	Digital Trunk: E-1 Channelized (Std: ITU-TSS G.702)	Up to 1.92 Mbps	SS7, E1 Signaling	

UNI Type	Interface Type and Standard	Payload Data Rate or Bandwidth	Signaling Type	[redacted]
5	All (IEEE) 802.3 cable and connector types	Up to 100 Mbps	IEEE 802.3. IPv4. (IPv6 when and where available commercially from contractor)	
6	If the Agency provides the CODEC and the inverse multiplexer, and the contractor provides only reservation, coding conversion, and/or format conversion	Up to 1.536 Mbps	ITU-TSS V.35 (EIA) RS-449 EIA RS-530 RJ-x (e.g., RJ-45) EIA RS-232	

J9 Technical Table - Mandatory Technical Narratives

1) Reservation System Capabilities (Req_ID 32548), (C.2.8.1.1.4 (13)(f))

[redacted]

From a practical perspective, large calls are managed as an "event call" where they are subjected to specific processes to ensure that the call is properly managed and executed. Call producers will work with Agencies to decide the most effective way in which to run a call, the order to connect sites, and any special requirements, such as a choreographed question and answer session. [redacted]

In addition, where the type of large call includes a one-way trade of information to the viewers, video calls can also be streamed to the World Wide Web. This offers a line of alternative features and capabilities as well as a cost-effective method of reaching literally hundreds of thousands of users.

2) Certification (Req_ID 32577), (C.2.8.1.2 (2))

Agency video systems will be registered, pre-tested, and certified compatible with our VTS service.

Qwest will provide pre-testing, registration, and certification for all Agency equipment to ensure compatibility with VTS and successful video conferences. Sites can be registered in one of three ways: via a Web-based form, via the Customer Service Office, or through the sales team. Once a site has been registered, it will automatically be scheduled for certification. Upon successful certification, it is noted as certified in the database, and a notification of successful testing is forwarded to the Agency contact. If the certification is unsuccessful, Qwest will troubleshoot with Agency Staff until a successful certification occurs.

3) Dissimilar Interfaces or Networks (Req_ID 32525), (C.2.8.1.1.4 (5))

Agencies with varying networks [redacted] and dissimilar equipment, including older legacy video units, will be supported by Qwest's VTS. Using a variety of gateways [redacted] gatekeepers [redacted] and MCUs, Qwest will coordinate and launch video teleconferences between the Agencies' dissimilar equipment, allowing them to successfully meet and collaborate when needed.

4) Bridge Capabilities and Services (Req_ID 32526), (C.2.8.1.1.4 (6))

Agencies will be supported by Qwest's four, fully-redundant VTS NOCs that are equipped with [redacted] These NOCs are also designed to remotely support and manage Agency-owned IP equipment and networks if they elect to use our managed services.

5) Agency Firewall Compatibility (Req_ID 32567), (C.2.8.1.1.4 (17))

It is understandable that many Agencies will have firewalls in place to help them regulate and secure their video conferencing environments. Qwest will work with each individual Agency to identify a solution that will allow us to provide service to the Agency regardless of their firewalls. [redacted]

5.2.7.4 Achieving Quality of Service Goals (L.34.1.5.4 (d)), (C.2.8.1.4)

[redacted]

Figure 5.2.7-6. Qwest Video Teleconferencing Service Acceptable Quality Levels

Key Performance Indicator	User Type	Performance Standard (Threshold)	Acceptable Quality Level (AQL)	[redacted]
Availability	Routine	99.5%	≥ 99.5%	[redacted]
Time to Restore	Without Dispatch	4 hours	≤ 4 hours	[redacted]
	With Dispatch	8 hours	≤ 8 hours	[redacted]
Grade of Service (Completed Service Requests)	Routine	95% of VTS conference requests met	≥ 95%	[redacted]

[redacted]

[redacted]

5.2.7.6 Experience with Video Teleconferencing Service Delivery (L.34.1.5.4 (f))

The Qwest Team provides bridging and technical support for more than [redacted] per year and is a preeminent provider of such services. [redacted]

[redacted] Leading VTS equipment vendors often come to the Qwest Team to evaluate and test their new equipment and software releases prior to the availability of such products in the marketplace.

5.2.7.7 Approach to Performance Verification (L.34.1.5.4 (g))

Qwest will supply Agencies with video site profile forms that will gather all the necessary information for them to certify the Agency's individual locations. Once we have the information, we will register and provision the video sites in our database and schedule a certification test for the sites. We perform the test by dialing out to the video site and reviewing the diagnostics reported by the system to our bridge, noting in our operating system all capabilities of the endpoint. If successful, we mark the site as certified in our system. If not successful, we notify the administrative and/or technical contacts at the Agency location. The Qwest Team will then schedule additional tests until we can successfully certify the site.

Agencies will have access to online reporting [redacted] that will provide them with service performance data, video teleconferencing usage, trouble ticket reporting, and other information. [redacted] The Qwest Team's proactive approach is monitored, managed, and audited against customer satisfaction surveys on a monthly basis. [redacted]

[redacted]

5.2.7.8 Delivery Impact on Network Architecture (L.34.1.5.4 (h))

The Qwest Team's VTS is in place and operational today. There is no need to modify our network to support Networx requirements.

5.2.7.9 Approach to Satisfying NS/EP Requirements (L.34.1.5.4 (i))

The Qwest Team supports the telecommunications requirements for National Security and Emergency Preparedness (NS/EP) that are based on a set of telecommunications policies and procedures established by the National Communications System (NCS) in accordance with Executive Order 12472, developed to ensure that critical Government and industry needs are met when an actual or potential emergency threatens the security or the economic capabilities of the United States.

Specifically, Qwest supports the following functional requirements for NS/EP telecommunications and IT services. These are identified by the NCS and the Office of Science and Technology Policy for NS/EP telecommunications services as follows:

Enhanced Priority Treatment. VTS services supporting NS/EP missions are given preferential treatment over other traffic.

- Qwest has a single point of contact responsible for issuing Government Emergency Telecommunications Service cards for Qwest employees with NS/EP missions.
- All VTS services have priority provisioning and restoration capabilities.

Secure Networks. Networks must have protection against corruption of, or unauthorized access to, traffic and control, including expanded encryption techniques and user authentication, as appropriate.

- All VTS services are designed with security control mechanisms. Active fraud detection and prevention is designed into VTS products, and all systems supporting services are designed with two-factor access controls and audit control features.
- All Qwest data network operations support systems require two-factor authentication for access.

Non-Traceability. Selected users must be able to use NS/EP services without risk of usage being traced (that is, without risk of the user or location being identified).

- The MCU prevents any one connected party's automatic number identification (ANI) from reaching any other connected party, whether the connection is audio only or video. The MCU is the originator of the call (or terminator of the call, in the case of dial-in). The parties don't call one another directly. When the MCU dials out to participants, the ANI they receive is the MCU's, or, to be more accurate, the ANI assigned by the carrier to the circuit that terminates to the MCU. When the party dials in, the ANI is delivered to and stops at the MCU. Parties connected to the bridged call would not receive each other's ANI as the Qwest Team's Network / MCU is the termination point for all the calls.

Restorability. Should a service disruption occur, voice and data services must be capable of being re-provisioned, repaired, or restored to required service levels on a priority basis.

- Qwest adheres to both State and Interstate Public Services Commissions orders related to Telephone Service Priority (TSP).
- A dedicated manager in risk management/disaster preparedness administrates the TSP program for Qwest.

- The Qwest director for NS/EP is a principal on the national TSP Oversight Committee.
- VTS services are restored in adherence to the NS/EP and TSP mandates.

International Connectivity. Voice and data services must provide access to and egress from international carriers.

- Qwest has numerous connection points to international carriers for circuit provisioning, traditional data products (ATM) and Frame Relay, IP services, and Internet access. We have international VTS service gateways and international Internet peering locations.

Interoperability. Voice and data services must interconnect and interoperate with other Government or private facilities, systems, and networks, which will be identified after contract award.

- Qwest offers a rich collection of VTS interconnects and interconnect types, all standards based. Our any access approach means that Qwest can connect to virtually any existing Government VTS network—whether it is based on ISDN or IP, although it must adhere to H.232 or H.230 standards.

Nationwide Coverage. Voice and data services must be readily available to support the National Security leadership and inter- and intra-Agency emergency operations, wherever they are located.

- Qwest offers ubiquitous VTS services to all local access transport areas within the nation to support the National Security leadership and Agencies during emergency operations.
- Qwest has interconnection and access to Guam, Puerto Rico, and the U.S. Virgin Islands.

Survivability/Endurability. Voice and data services must be robust to support surviving users under a broad range of circumstances, from the widespread damage of a natural or man-made disaster up to and including nuclear war.

- The Qwest diverse and redundant fiber network is primarily buried four feet below ground along railroad rights-of-way, which significantly reduces the impact of both natural and man-made disasters.
- Qwest VTS services have the capability to re-route traffic around failed network components and failed network facilities with full transparency to the end user.

Voice Band Service. The service must provide voice band service in support of Presidential communications.

- Qwest offers a facilities-based national and international network to support Presidential communications. Our Federal Service Center specifically responds to presidential travel requirements.

Affordability. The service must leverage network capabilities to minimize cost (for example, use of existing infrastructure, commercial-off-the-shelf (COTS) technologies, and services).

- The Qwest Team actively leverages and optimizes our commercial assets and deploys COTS technologies, rigorously tested in our integration and test laboratory, to reduce implementation risk and minimize cost to the end user.

Reliability/Availability. Services must perform consistently and precisely according to their design requirements and specifications and must be usable with high confidence.

- The Qwest Team's product development, engineering, and operations approach is directly targeted to ensure that VTS services are planned, engineered, and operated in a manner to ensure conformance to our design requirements and specifications.
- The use of ISDN and IP technologies is leveraged to ensure high availability of our VTS services.
- We continually monitor our utilization metrics and apply strict policies to ensure end-to-end customer performance.

5.2.7.10 Approach to Assured Service in the National Capital Region (L.34.1.5.4 (j))

With respect to VTS, the Qwest Team has Operation Centers just outside the National Capital Region (NCR) [redacted] each with redundant connections, provide exceptionally high levels of reliability and availability.

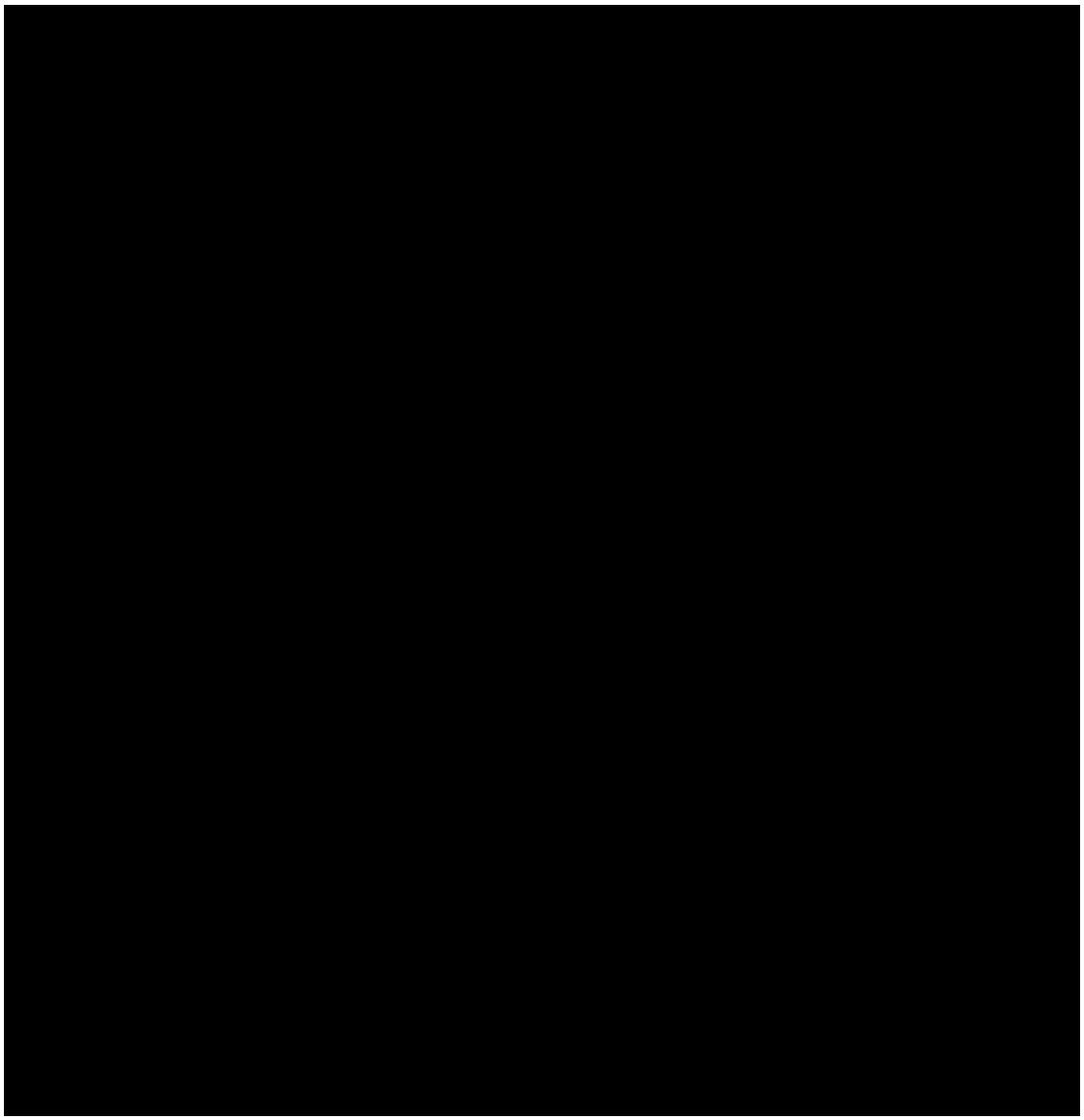
All bridging equipment is front-ended by multiple networks (ISDN and IP), which provide multiple layers of network redundancy. All network traffic is delivered to the facilities over three independent SONET rings.

[redacted]

Qwest understands the Government's requirement to ensure performance of network services in and around the NCR. To meet this important requirement, Qwest has established Point-of-Presence (POP) diversity in the NCR. [redacted] Washington, [redacted] Each of these gateways provides complete redundancy to access Qwest nationwide and international network capabilities as well as regional voice and data services. Qwest also has a [redacted] provisioning POP [redacted] which serves as an access POP, IP services node, and high-availability collocation and hosting center.

[redacted] shows both the logical configuration of the major transport facilities as well as the services provided at each POP.

[redacted]



In addition to our nationwide SONET rings, Qwest also has a completely separate regional network that [redacted] POPs in a route-diverse SONET-protected ring. This configuration enables these [redacted] locations to participate in the routing of access and backbone traffic, providing significant load balancing and reconfiguration options in the event of a switch, router, or even a complete POP failure. Qwest has recently acquired OnFiber,

a metro SONET and Ethernet provider with yet another diverse network in the NCR. This gives Qwest [redacted] fiber optic networks to use to ensure redundancy and survivability in the greater Washington D.C. area. In effect, this means that Qwest can completely avoid Washington, D.C. to continue to provide services in an emergency.

[redacted] Qwest operates in the NCR and the Incumbent Local Exchange Carriers (ILECs) and numerous Competitive Local Exchange Carriers (CLECs) that Qwest uses to connect to NCR customers. In particular, Qwest connects to several major ILEC POP locations, which ensures multiple access paths to ILECs services that include voice termination and fiber access. The use of CLECs, with infrastructure that is generally separate from the ILECs, gives another level of resiliency to the architecture, because these services would not be affected by an ILEC facility failure.

To ensure the flow of voice services and ISDN video calls into and out of the NCR, Qwest connects to [redacted] ILEC access tandems. This ensures that Qwest can hand off traffic [redacted] in the event of a complete Qwest POP failure. Qwest supports a dual-homing arrangement for call overflow or load balancing between two or more diverse voice switch locations. Using Qwest's diverse access infrastructure affords the maximum protection for a customer in the event of the loss of a switch or transport system failure.

The route-diverse SONET backbone and access networks that service the NCR enable the transport of services to virtually any Qwest POP nationwide. [redacted]

[redacted] As with voice services, critical Qwest customers can be dual homed to ensure extremely high availability of their data services—again protected from any single point of failure in the NCR.

Qwest's Internet backbone is extremely well connected to other Internet service providers (ISPs). Qwest peers with the largest ISPs [redacted] private peering locations geographically distributed throughout the United States, and the loss of a single peering point has virtually no effect on our ability to provide high-quality access to the Internet. [redacted] As with other data services, Qwest can dual home critical customer connections with complete route diversity to all of Qwest's data networking services to have complete resiliency from facility failures in the NCR.

5.2.7.11 Approach to Meeting Section 508 Provisions (L.34.1.5.4 (k))

According to RFP Section C.6.4, *Section 508 Provisions Applicable to Technical Requirements*, Section 508 provisions are not applicable to VTS. Qwest has fully described our approach to satisfying Section 508 requirements for applicable, offered services in Section 3.5.4, *Approach for Meeting Section 508 Provisions*, of this Technical Volume.

5.2.7.12 Approach to Incorporating Technological Enhancements and Improvements (L.34.1.5.4 (l))

Qwest has mature processes that enable us to envision, research, evaluate, engineer, deploy, and operate new or emerging services. Driven initially by the Chief Technology Office, Qwest evaluates new products and technologies for incorporation into the Qwest network, in conjunction with Qwest product management.

[redacted]

[redacted]

[redacted]

[redacted]

Today, most carriers use only dedicated circuits from ILECs and CLECs. The procedures for ordering, provisioning, and performing trouble resolution and repair are well known and understood. However, the proliferation of new access methods, such as connecting to ILEC ATM and FR networks, shared Ethernet delivery, and xDSL for access, brings new complexities to all of these processes. For example, in general, dedicated circuits either run clean or have errors that are generally automatically detected by carrier network equipment, with alarms and trouble tickets automatically generated. In the case of a Layer 2 access (for example, FR or Ethernet), there may be no traditional circuit problems, but congestion or problems in the local data network may occur. [redacted]