

**EXHIBIT V to Amendment No. 60**  
Addendum 6 to Appendix 9 to Schedule 3.3 to the  
Comprehensive Infrastructure Agreement  
Statement of Technical Approach

**ADDENDUM 6 TO APPENDIX 9 TO SCHEDULE 3.3  
TO THE  
COMPREHENSIVE INFRASTRUCTURE AGREEMENT  
STATEMENT OF TECHNICAL APPROACH**

## **Statement of Technical Approach for Voice and Video Telco Services**

Northrop Grumman will consolidate voice, video and data on a single multi-service IP network. Through the use of voice and video over IP, Northrop Grumman will reduce additional Centrex costs, reduce Install, Move, Add, and Change (IMAC) costs, and reduce the burden of maintenance and configuration management for voice and video telecom services.

In addition to the Centrex voice services, Verizon Business, as an exclusive partner to Northrop Grumman, is delivering the long-distance PSTN services, calling cards, and inbound toll-free (dedicating and switched) calling.

As the business cases dictate, Northrop Grumman will migrate voice and video services to its single multi-service network. Northrop Grumman will reduce the need for additional access lines because the voice and video services will be integrated on the single multi-service network.

Northrop Grumman will deliver a voice and video telecom service that will continue to support existing service offerings (such as Centrex voice), and based on business case, migrate to IP-based solutions to provide savings and operational simplicity and flexibility.

Northrop Grumman will provide IP voice services through two service offerings (1) a hosted Unified Communications as a Service (UCaaS) VoIP Services, and (2) a Carrier Hosted Voice Service (CHVS) leveraging the Commonwealth's Verizon Broadsoft ILEC/HIPC (HIPC) service. These services support the Commonwealth's goals for reducing cost through the use of IP telephony services. UCaaS VoIP Services provide a foundation for full-featured voice services from standard telephony up to Call Center and Video over IP services providing an advantage to Commonwealth agencies over the CHVS and HIPC services. UCaaS provides all the benefits of a VoIP service, leveraging the VITA MPLS investment and addresses two key Commonwealth needs:

- Statewide coverage to MPLS-connected sites
- Voice service redundancy for any MPLS connected site

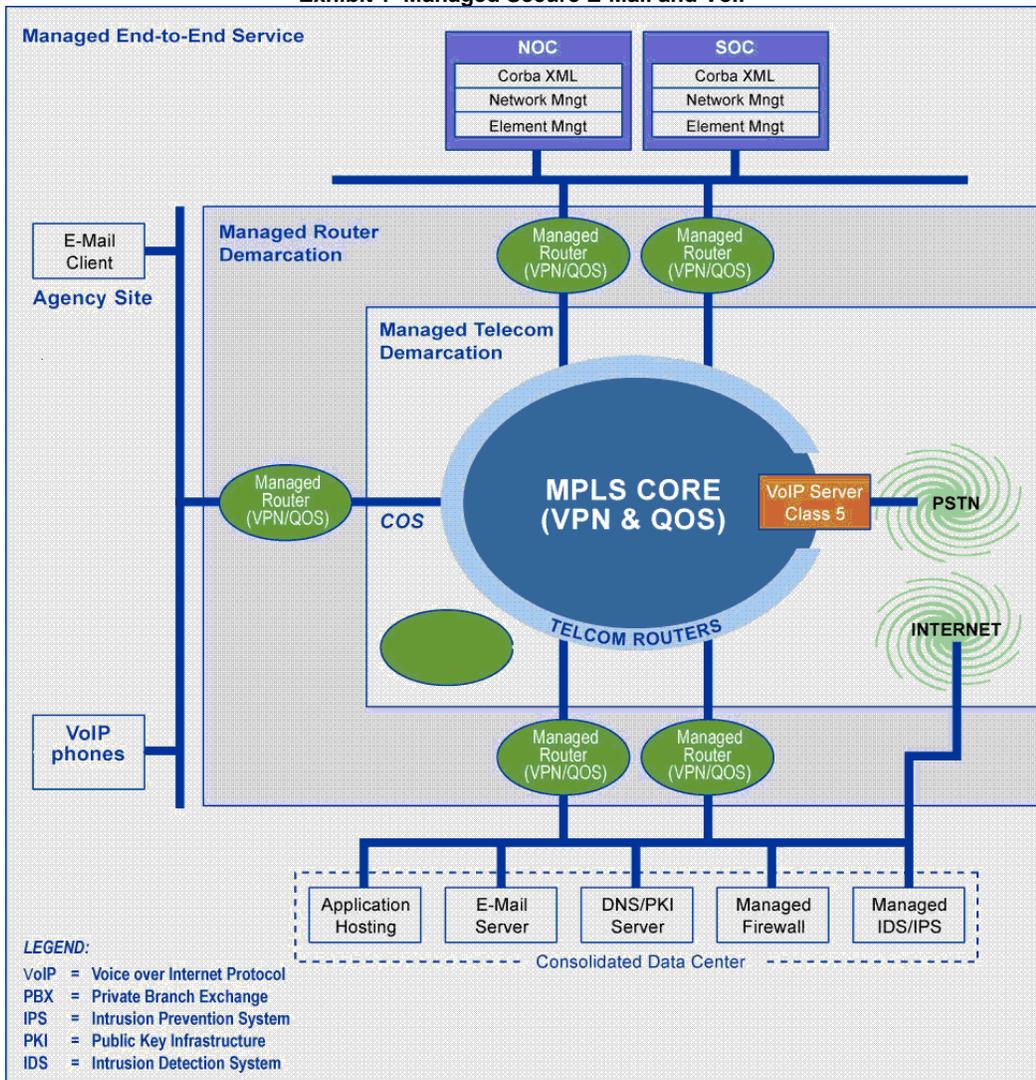
### **Detailed Solution for Managed End-to-End Service**

To deliver enterprise services and flexible service applications, Northrop Grumman will deliver a managed end-to-end service. As shown in **Exhibit 1**, Northrop Grumman's service approach integrates secure e-mail and VoIP telephony on a single multi-service network that incorporates end-to-end QoS to meet the diverse SLAs. VITA's network will support QoS to provide the necessary end-to-end SLA requirements (especially jitter) essential for VoIP communications.

The Northrop Grumman multiservice network solution also supports the quality of service (QoS) to support video across Northrop Grumman's IP-based solution.

Northrop Grumman's VoIP and video over IP can communicate securely through its Internet Secure Gateway to extranets outside the Commonwealth of Virginia. Northrop Grumman's managed VoIP and video over IP solution are part of its managed, consolidated service architecture.

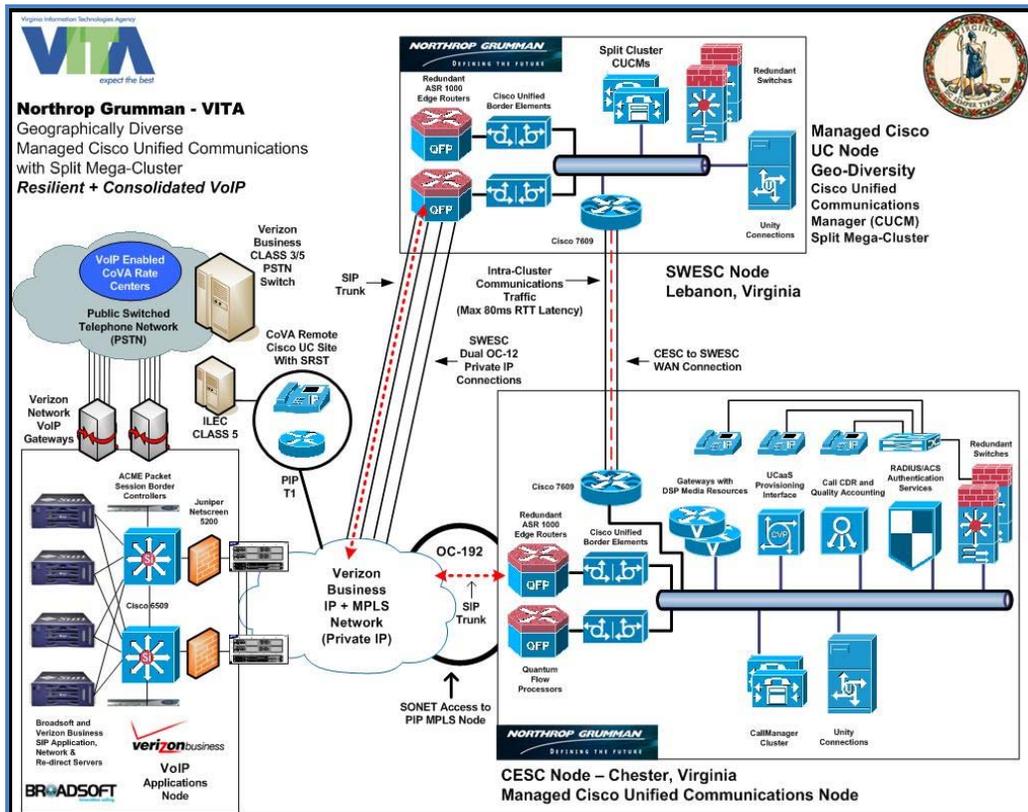
**Exhibit 1 Managed Secure E-Mail and VoIP**



**Exhibit 1 Managed Secure E-Mail and VoIP**

**IP Voice Services**

Enterprise IP Voice Services are available to Commonwealth agencies through three products UCaaS, CHVS and HIPC. All three products offer a hosted VoIP service, however the UCaaS provides a foundation for the addition of new services to support broad agency needs. As shown in **Exhibit 2**, Northrop Grumman’s service approach for UCaaS services provides a common, secure platform for VoIP. UCaaS is hosted at the CESC data center with redundancy provided at the SWESC data center.



**Exhibit 2 Unified Communications as a Service (UCaaS) VoIP**

UCaaS design and features provides a solution allowing the Commonwealth:

- To leverage the MPLS network investment
- An opportunity for Statewide coverage not restricted to local telephone carriers
- To centralize the service delivery from the CESC and SWESC facilities allowing incremental growth of the core system spreading the investment across many agencies and sites versus the purchase and installation of individual site based systems

- To lower Long Distance expenses
- Phone service redundancy, providing service in the event MPLS connection is lost
- To incrementally invest in a high quality IP based voice infrastructure where new services can be added on demand to meet the Commonwealth's business needs, these include contact center / call center, rich media conferencing, and unified presence

Key benefits of UCaaS to the Commonwealth:

- Carrier-grade reliability using Cisco's industry-leading Call Manager VoIP platform
- Easily-scalable service allowing capacity to be added as the user population grows
- Common voice service across agencies for all agencies on MPLS
- Ability for agencies on end-of-life phone systems to migrate to a monthly RU based service model avoiding upfront capital and one-time installation charges

### **Current Voice and Video Telco Services and Migration Scenarios**

Northrop Grumman understands the voice contracts available to VITA and the voice and video services for VITA. Northrop Grumman will continue to operate voice and video services using those contracts.

In Contract Year Four, Commonwealth agencies primarily use Verizon's Centrex, a 1970's telephony service for voice communications. Although Centrex has proven to be a reliable service for phone equipment, voice network, voice messaging, and directory listing services; the technology cannot be upgraded to offer agencies key new services which can be leveraged to lower business cost and improve citizen services (e.g. call centers / contact centers).

Northrop Grumman will continue to operate the legacy services (Centrex, PBX and Key systems) through the existing contracts. Upon execution of Amendment No. 60, the Commonwealth will adopt UCaaS as the Voice Services Standard for all agencies. Through planned migration of voice, Northrop Grumman will provide UCaaS as a primary service and provide CHVS and HIPC as requested.

The initial target population for IP Voice Services is 35,000 phones consisting of new UCaaS phones and existing CHVS and HIPC phones. As shown in Exhibit 3 the target population is comprised of agencies currently supported by legacy services such as Centrex, PBX and legacy Call Manager/Express. Northrop Grumman has identified 11 target agencies as candidates for new UCaaS based on several factors, including cost reductions, retiring of aging phone systems and availability of MPLS network connection. Northrop Grumman's current understanding is the target agency sites and ramp-up schedules provided in Exhibit 3 and 4 do not use IVR or call center services. The deployment plan is based historical information provided by staff familiar with the Commonwealth's telephony infrastructure.

Northrop Grumman recognizes the business needs of an agency site using IVR or call center services require additional features beyond the initial set of standard UCaaS service offerings. Northrop Grumman will develop additional UCaaS Resource Units as needed by the Commonwealth based upon agency specific requirements.

**EXHIBIT V to Amendment No. 60**  
Addendum 6 to Appendix 9 to Schedule 3.3 to the  
Comprehensive Infrastructure Agreement  
Statement of Technical Approach

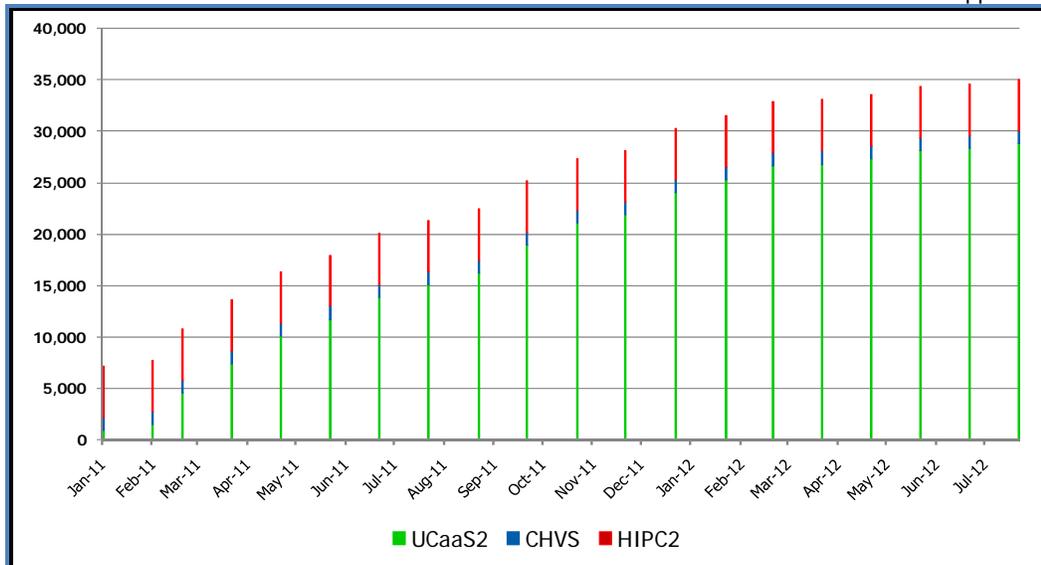
Upon execution of Amendment 60, Northrop Grumman will brief VITA telecommunications staff on the UCaaS architecture, UCaaS service offerings, and the basis of the selected target agencies, sites, and ramp-up schedule. Work sessions with VITA will result in refinements to the schedule based on Commonwealth business priorities. VITA and Northrop Grumman will develop and execute a plan to introduce and promote the services to agencies. Work sessions with each target agency will be scheduled to solicit and obtain their acceptance and commitment to adopt and schedule the installation of UCaaS. Upon Agency acceptance of the schedule Northrop Grumman will collect the information needed to configure the phones for each user and schedule the work. Northrop Grumman will procure and build the core infrastructure, stand-up required back office systems needed to provision, manage and invoice UCaaS Service, and proceed with deployment of the phones and infrastructure to the sites.

The target deployment plan for UCaaS begins on July 1, 2010 with the finalization of the UCaaS core infrastructure requirements, design and procurement. The plan includes a 6 month window to complete the installation and testing of the core infrastructure and ready agencies for deployment of the UCaaS service commencing in January 2011 and running through August 2012 as shown in Exhibit 4.

**EXHIBIT V to Amendment No. 60**  
Addendum 6 to Appendix 9 to Schedule 3.3 to the  
Comprehensive Infrastructure Agreement  
Statement of Technical Approach

<b>Test Site Installs &amp; Support</b>		<b>Phones</b>	<b>Sites</b>
Health	Centrex/UCaaS	868	24
<b>Production Site Installs</b>			
Health	PBX/UCaaS	52	1
Health	Call Mgr/UCaaS	820	2
VDOT	Centrex/UCaaS	2,205	25
VDOT	PBX/UCaaS	722	2
VDOT	Call Mgr Express/UCaaS	82	2
Mental Health	Centrex/UCaaS	2,904	9
Mental Health	PBX/UCaaS	117	1
DMV	Centrex/UCaaS	1,705	37
DSS	Centrex/UCaaS	1,045	21
DSS	Call Mgr/UCaaS	750	1
VSP	Centrex/UCaaS	946	5
ABC	Centrex/UCaaS	325	48
ABC	PBX/UCaaS	580	2
VEC	Centrex/UCaaS	632	19
Agriculture	Centrex/UCaaS	1,010	2
DOC	Centrex/UCaaS	608	37
DOC	PBX/UCaaS	1,790	19
DOC	Call Mgr/UCaaS	2,654	17
DOC	Call Mgr Express/UCaaS	1,535	48
Tax	Centrex/UCaaS	584	2
DEQ	Call Mgr/UCaaS	1,133	10
Other Agencies	Centrex/UCaaS	5,697	65
<b>Total Conversions to UCaaS</b>		<b>28,764</b>	<b>399</b>
<b>Hosted Voice Service Base</b>			
	Centrex/UCaaS	18,529	294
	PBX/UCaaS	3,261	25
	Call Mgr/UCaaS	5,357	30
	Call Mgr Express/UCaaS	1,617	50
	VZ HIPC	4972	0
	NG CVMS	<u>1264</u>	<u>0</u>
<b>Total</b>		<b>35,000</b>	<b>399</b>

**Exhibit 3 UCaaS Target Base**



**Exhibit 4 IP Voice Services – UCaaS Ramp-up**

### UCaaS Service Offerings

Northrop Grumman will initially offer four classes of UCaaS service described in the following table.

<b>Basic Service</b>	Service includes a phone and a direct dial number. The phone included with this service is a single line phone (no speakerphone).
<b>Basic Service Option</b>	Basic Service without the phone; service is for an existing CISCO Call Manager phone where existing phone is reused for UCaaS
<b>Standard Service</b>	Service includes a phone, a direct dial number and voice-mail. The phone included with this service is a two-line speakerphone.
<b>Standard Service Option</b>	Standard Service without the phone; service is for an existing CISCO Call Manager phone where existing phone is reused for UCaaS
<b>Enhanced</b>	Service includes a phone, a direct dial number and voice-mail. The phone included with this service is a six-line speakerphone.
<b>Enhanced Option</b>	Enhanced Service without the phone; service is for an existing CISCO Call Manager phone where existing phone is reused for UCaaS
<b>Receptionist</b>	Service includes a receptionist phone with two sidecars, and voice-mail. The service and phone included allow a receptionist to monitor up to 30 lines.
<b>Receptionist Option</b>	Receptionist Service without the phone; service is for an existing CISCO Call Manager phone where existing phone is reused for

	UCaaS
<b>Conference</b>	Service includes a conference “spider” phone.
<b>Conference Option</b>	Conference Service without the phone; service is for an existing CISCO Call Manager phone where existing phone is reused for UCaaS
<b>UCaaS IMAC - Over Network Change</b>	IMAC change provisioned over the network
<b>UCaaS IMAC - On-Site Change</b>	IMAC change requiring provision on-site by a technician

**Exhibit 5 IP Voice Services – UCaaS Service Description**

**UCaaS network Based Features**

UCaaS offers outbound calling features which can be tailored to the Commonwealth’s enterprise standard. These features require line identification are available only to locations in which the local phone carrier supports line identification service. The following table summarizes the features available to each UCaaS Service.

<b>Feature</b>	<b>Description</b>	<b>UCaaS Service</b>
<b>Attended Call Transfer</b>	Allows a user to announce a caller or consult with a third party before transferring the call. This feature is also known as “Call Transfer with 3 <sup>rd</sup> Party Consultation”.	Basic Standard Enhanced Receptionist Conference
<b>Call Blast– Personal</b>	Enables multiple phones to ring simultaneously. For example, calls to a user’s desk phone could also ring the user’s mobile phone. The first phone to be answered is connected. When already on a call, users can choose whether other simultaneous devices ring.	Basic Standard Enhanced Receptionist Conference
<b>Call Forwarding</b>	Enables phone service to be set to forward the call to a user selected phone number.	Basic Standard Enhanced Receptionist Conference
<b>Call Return</b>	Enables a user to call the last party that called, whether or not the call was answered, by dialing a feature code. The system stores the number of the last party to call, and connects the user to that party. Users can also execute call return via the UCaaS Communications Manager.	Basic Standard Enhanced Receptionist Conference

**EXHIBIT V to Amendment No. 60**  
 Addendum 6 to Appendix 9 to Schedule 3.3 to the  
 Comprehensive Infrastructure Agreement  
 Statement of Technical Approach

Feature	Description	UCaaS Service
<b>Calling Line ID Blocking</b>	Enables a user to block delivery of his/her Calling Line ID when making outbound calls.	Basic Standard Enhanced Receptionist Conference
<b>Calling Line ID Delivery</b>	Enables the delivery of inbound CLID or phone number.	Basic Standard Enhanced Receptionist Conference
<b>Consultation Hold</b>	When the call is answered, the user can consult with the add-on party. To drop the add-on party and reconnect to the original party, the user depresses the flash hook twice.	Basic Standard Enhanced Receptionist Conference
<b>Direct Inward/ Outward Dialing</b>	Users are assigned a 10-digit directory number that can be used to place or receive calls directly, without forcing access via a central number.	Basic Standard Enhanced Receptionist Conference
<b>Do Not Disturb</b>	Allows users to set their extension as unavailable so that incoming calls are given a busy treatment.	Basic Standard Enhanced Receptionist Conference
<b>Extension Dialing</b>	Enables users to dial other members of the group using extension numbers.	Basic Standard Enhanced Receptionist Conference
<b>Flash Call Hold</b>	Provides call hold functionality from any phone. It enables users to hold a call for any length of time by flashing the switch-hook on their phone and dialing the respective feature code. Parties are reconnected again when the switch-hook is flashed and the feature code is dialed again.	Basic Standard Enhanced Receptionist Conference
<b>Last Number Redial</b>	Enables users to redial the last number they called by clicking the 'Redial' button on the Communications Manager screen or by dialing a feature code.	Basic Standard Enhanced Receptionist Conference

**EXHIBIT V to Amendment No. 60**  
 Addendum 6 to Appendix 9 to Schedule 3.3 to the  
 Comprehensive Infrastructure Agreement  
 Statement of Technical Approach

Feature	Description	UCaaS Service
<b>Inbound Caller ID</b>	Users can choose to take a call when they see the caller's identity via the UCAAS Communication Manager and phone (if capable). Information delivered includes the caller's phone number. The information is delivered only if the information is available and has not been blocked by the caller.	Basic Standard Enhanced Receptionist Conference
<b>Outbound Caller ID</b>	The originating location sends the Billing Telephone Number (BTN) of the caller when making outbound calls. Currently, station level (ANI) is not available.	Basic Standard Enhanced Receptionist Conference
<b>Phone List – Personal</b>	Each user can add, delete, edit and re-order numbers in their Personal Phone List, which serves as a personal speed dial list. Users can add multiple numbers to this list by uploading them from a file. Users can dial frequently called numbers by selecting from a searchable list of names in the UCaaS Communications Manager.	Basic Standard Enhanced Receptionist Conference
<b>Phone List – Call Log</b>	The call log is accessed through the UCaaS Communications Manager and includes the most recent numbers registered for each category, as well as the respective call times and dates. The Call Log enables users to view and dial from the following lists of stored numbers: missed, received, and dialed.	Basic Standard Enhanced Receptionist Conference
<b>Speed Dial</b>	Users can program frequently called numbers.	Basic Standard Enhanced Receptionist Conference
<b>Voice Mail</b>	<p>One of the most powerful features of the UCaaS is its network-based voice mail service. Features include distribution lists across geographically dispersed offices and a variety of retrieval options, such as phone, pager, or e-mail. Mailboxes can be accessed either via a telephone through DTMF tones. UCaaS Voice Mail offers traditional features with new capabilities based on IP functionality:</p> <ul style="list-style-type: none"> <li>• Access and security</li> <li>• Distribution lists</li> <li>• Easy commands</li> <li>• Greetings options</li> <li>• Message notification</li> <li>• Message Recording</li> <li>• Voice Mail system settings</li> </ul>	Standard Enhanced Receptionist

**Exhibit 6 IP Voice Services – UCaaS Call Features**

**Video & Teleconferencing Services**

**EXHIBIT V to Amendment No. 60**  
Addendum 6 to Appendix 9 to Schedule 3.3 to the  
Comprehensive Infrastructure Agreement  
Statement of Technical Approach

Northrop Grumman will support the current video services for those agencies' mission-critical video conferencing applications. Northrop Grumman will also begin to deploy video over IP capabilities that will enable the Commonwealth to extend the use of video across the agencies. Northrop Grumman will work with VITA in marketing video solutions over its IP infrastructure that improves the business processes and mission-critical needs for the Commonwealth.

Verizon Business offers video teleconferencing as part of its contract with VITA. Northrop Grumman will take over the management of these services as exist through manual mechanisms and improve on the management to be part of our centralized services through its single network services of MPLS. Northrop Grumman will work with VITA and the corresponding agencies to understand their equipment and management solution and improve upon its capabilities through consolidated of all services through a single network service of MPLS with dynamic QOS and VPNs.

Comment [c1]: Parking Lot

Northrop Grumman will meet with the Commonwealth on video teleconferencing requirements. Northrop Grumman, through its partnership with MCI, has designed and is delivering an advance MPLS solution that supports end-to-end dynamic QOS and VPNs on a per packet basis through its network service switches based on the applications.

Northrop Grumman will deliver each application with the required jitter, loss, and throughput that is required based on the port bandwidth that an agency procures. In addition, Northrop Grumman will monitor from Verizon Business centralized telecommunications Network Operations Centers and from Northrop Grumman's centralized enterprise Network Operations Center the utilization of bandwidth per quality of service. This per packet quality of service that is available to VITA and its agencies is unique and advanced in industry standard network services in supporting their applications. Thus, Northrop Grumman will deliver critical data applications and also latency and jitter sensitive voice and video application through its single port MPLS network services with QOS and VPN support.

In terms of video over IP, Northrop Grumman will provide a QOS that meets the jitter and loss requirements in its highest QOS level to communicate real-time video conferencing over its MPLS network services.