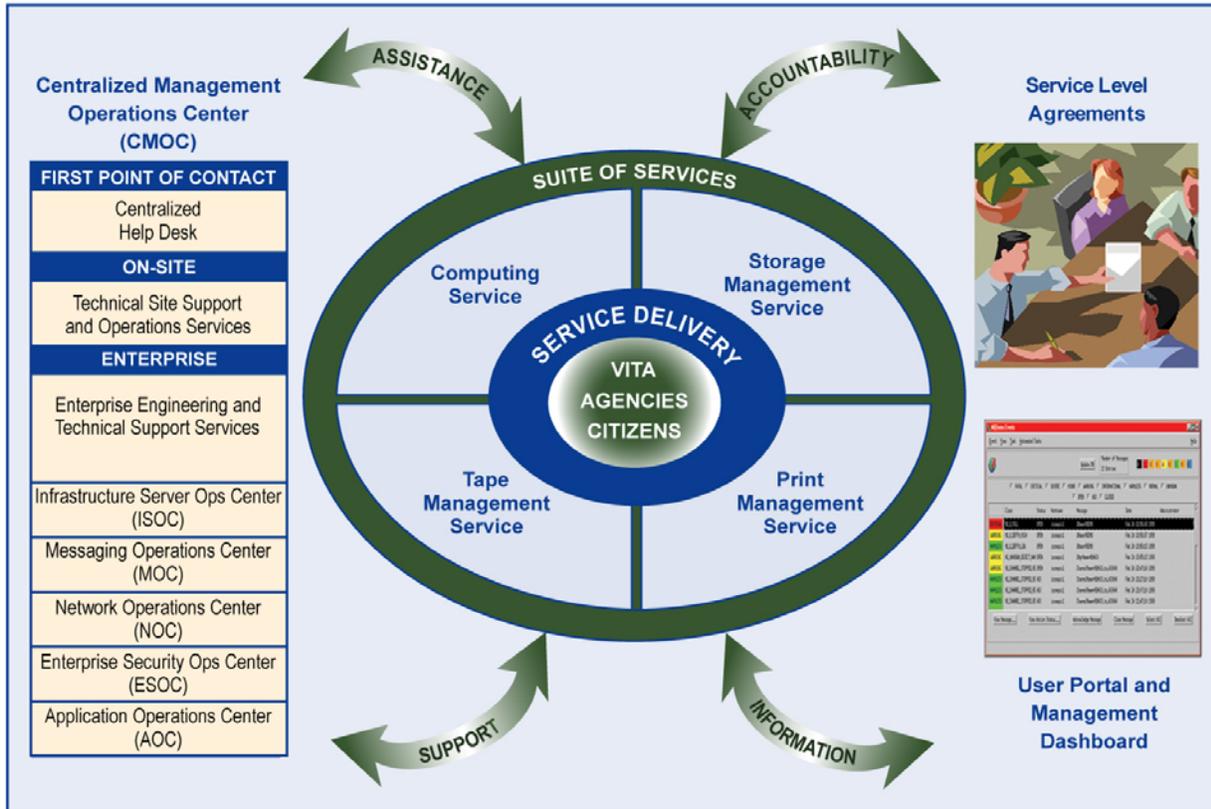


**ADDENDUM 6 TO APPENDIX 7 TO SCHEDULE 3.3
TO THE
COMPREHENSIVE INFRASTRUCTURE AGREEMENT
STATEMENT OF TECHNICAL APPROACH**

Statement of Technical Approach for Mainframe and Server Services

The Mainframe and Server Services approach is built on simplification of the mainframe and server infrastructure. **Exhibit 1** shows Northrop Grumman’s overall approach.



VITA 073-r4

Exhibit 1 Service Delivery Management

Northrop Grumman will implement and manage a technical approach that includes a Centralized Managed Operations Center (CMOC) to facilitate the delivery of managed services. Northrop Grumman will provide a single point of contact for problem resolution, a user portal, and the CMOC for the delivery of managed services.

The CMOC will be staffed at the Richmond Enterprise Solutions Center, and provide automated tools that:

- Proactively monitor system performance
- Make adjustments
- Perform corrective actions where appropriate
- Promote the health of the computer environment

A back-up CMOC will be provided in the Southwest Enterprise Solutions Center.

Northrop Grumman will provide VITA with feedback mechanisms to monitor performance using ITIL-based practices and enterprise systems management tools. The systems management applications will monitor, identify and correct problems enabling the management of change in real time. Following the principles of simplification, standardization and modularity, these systems management applications will provide visibility into the operational dynamics of the IT infrastructure, and provide feedback on performance. VITA will receive summary reports to track performance against SLAs.

Northrop Grumman's approach provides services that will:

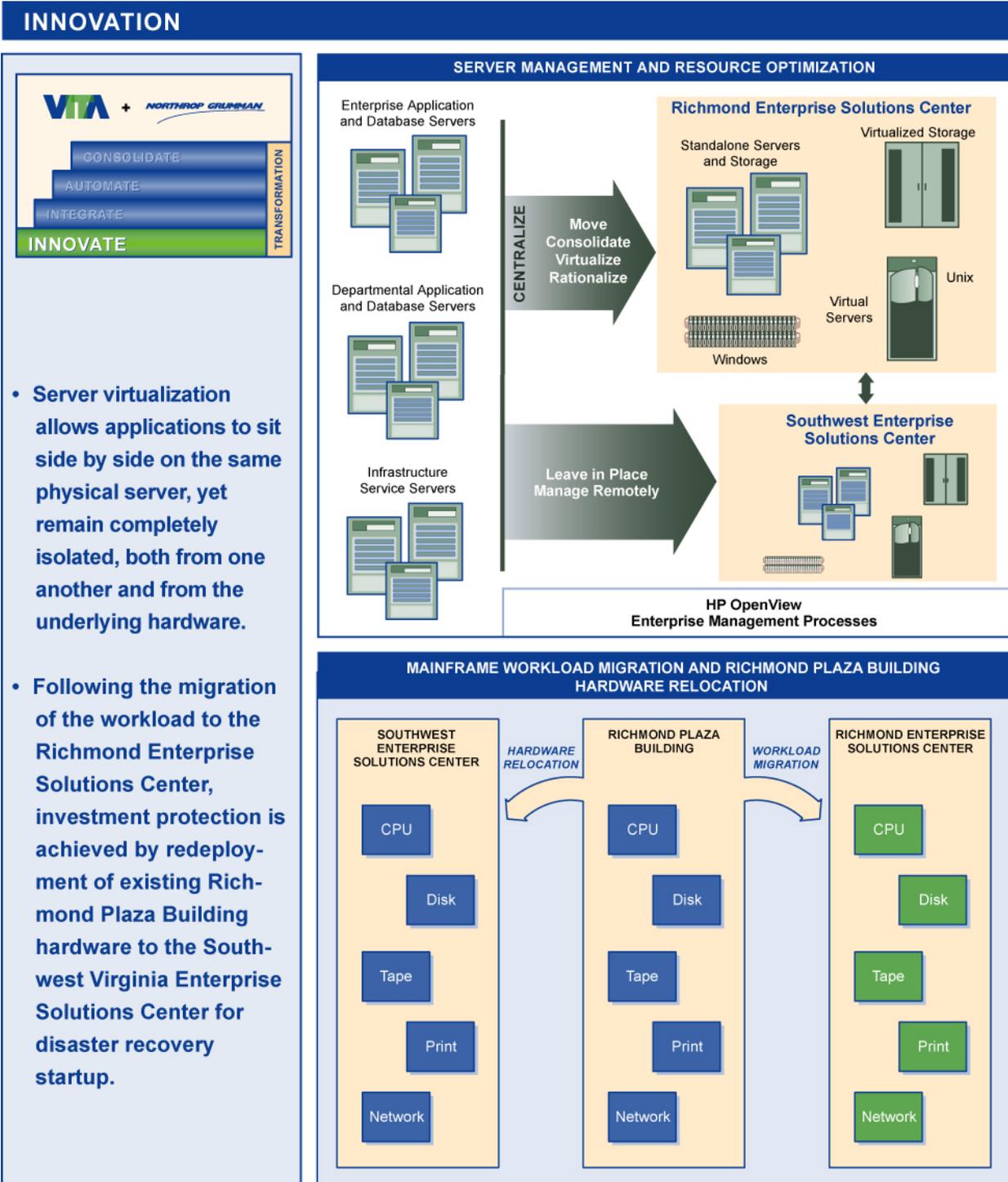
- Move processing from the Richmond Plaza Building to the Richmond Enterprise Solutions Center
- Standardize and deploy VITA-approved server software core images, create patch and configuration management strategies, stand up the infrastructure, provision storage, create technology refresh and back-up strategies, and create a lab/test environment
- Provide consolidation planning and application profiling to support the physical collapse of file and print servers, and server virtualization
- Install an integrated disk storage solution
- Expand the use of advanced tape robotics to improve data access performance, and reduce floor space for racked tapes
- Implement a consolidated print service
- Redeploy existing Richmond Plaza Building hardware assets to the Southwest Enterprise Solutions Center for use in disaster recovery

Northrop Grumman will engage VITA transitioned personnel to support systems, databases and disaster recovery.

Innovation

Exhibit 2 depicts the server consolidation approach.

Server Virtualization—Server Virtualization is an established method by which multiple unique server instances can be simultaneously “stacked” on a single server's hardware. Virtual servers employ dynamic provisioning that allows scaling with no changes in hardware.



VITA 063_r5

Exhibit 2 Server Consolidation Approach

Enterprise Systems Management—HP OpenView’s management solutions will provide continuous monitoring, reporting, troubleshooting, and automated response capabilities necessary for delivering availability and service. The use of Hewlett-Packard open standards provides interoperability and extensibility, reduces the complexity of managing multi-vendor / multi-platform environments.

Northrop Grumman will leverage HP OpenView as a component of its end-to-end service management solution to proactively discover, react, recover, and track events and service levels.

Technology Lab - A Systems Integration and Testing Laboratory (SITL) will be implemented to continuously research new technology and its possible applications.

Based on a detailed study of the Commonwealth’s environment and business practices, Northrop Grumman will evaluate and when feasible implement emerging technologies.

Integration

Northrop Grumman views integration as a multi-tiered, multi-phased process of unifying disparate systems.

The integrated approach to storage management occurs in three phases:

- *Phase I:* Integrate the IBM and Unisys mainframes onto a single storage subsystem platform
- *Phase II:* Integrate the server environment on a single Storage Area Network (SAN) infrastructure
- *Phase III:* Integrate the tape back-up systems to support both the Unisys mainframe and server environment allowing potential future integration of all platforms into a single system.

Technology Lifecycle Management—Northrop Grumman will manage the technology lifecycle and establish guidelines and timelines for technology refreshes for servers and storage solutions. Resource use will be monitored and measured on an ongoing basis. Usage reports will be generated and analyzed on a regular basis. Northrop Grumman will meet with representatives from the application teams to project future capacity requirements based on usage trends and application growth projections. Technology lifecycle management includes reuse of viable Commonwealth assets, many of which are within the current vendor product and model lifecycles.

Technology Refresh

Northrop Grumman’s technology refresh plan is driven by the age of the servers, as defined by the VITA during due diligence. Northrop Grumman intends to replace older servers first, reuse any servers that are still within the Vendor’s current product lifecycle, and then perform partial or complete technology refreshment on remaining server assets.

The initial server refresh on the Intel platforms will occur during the transition period while the server consolidation project is in process. Refresh and consolidation will occur on a 30%, 30%, 40% rate for years one, two and three respectively, with 90%+ servers being consolidated and refreshed in this timeframe. The UNIX refresh will commence concurrently in years one and two as the new data center is put in place and the UNIX hardware in RPB is evaluated. After the

initial refresh and consolidation project the servers will settle into a 20% per year refresh cycle to place the server environment within the Commonwealth on a standard five year technology plan starting in year six and beyond.

Not every server, however, can be refreshed, due to application-specific logic that may require it to run on an existing platform until specific application changes are made.

Two new mainframes will be installed in the RESC during transition. The Unisys mainframe will be refreshed in years 6 and 11 and the IBM mainframe will be refreshed with newer technology systems in year 8.

Standard Images—While VITA uses standard images within selected agencies to improve efficiency today, extending this policy across the enterprise with a standard image will further increase benefits by leveraging economies of scale. To accomplish this, Northrop Grumman will build a set of standard hardware and operating system configurations. These will be provided to the application community during the application development and selection processes. Given the Commonwealth's existing investment in Microsoft technology, it makes economic sense to establish a standard set of core Microsoft Windows 2003 Server configurations, based on HP and Dell servers and blades using Intel processors. This provides a ready migration path for the many Microsoft Windows servers already in the environment, and allows controlling and managing investment through the use of standard configurations.

Standard Platforms—Standardization and refresh is of importance wherever a service is required that meets a continuing business need. Standardization of server platforms will aid server consolidation efforts.

Automation

Northrop Grumman will expand the use and scope of automation to allow sharing of automated resources across platforms and locations. **Exhibit 3** identifies the types of manual tape activities that will be automated.

- Northrop Grumman's approach for tape management leverages the refresh of tape media, transports and tape automation across platforms.

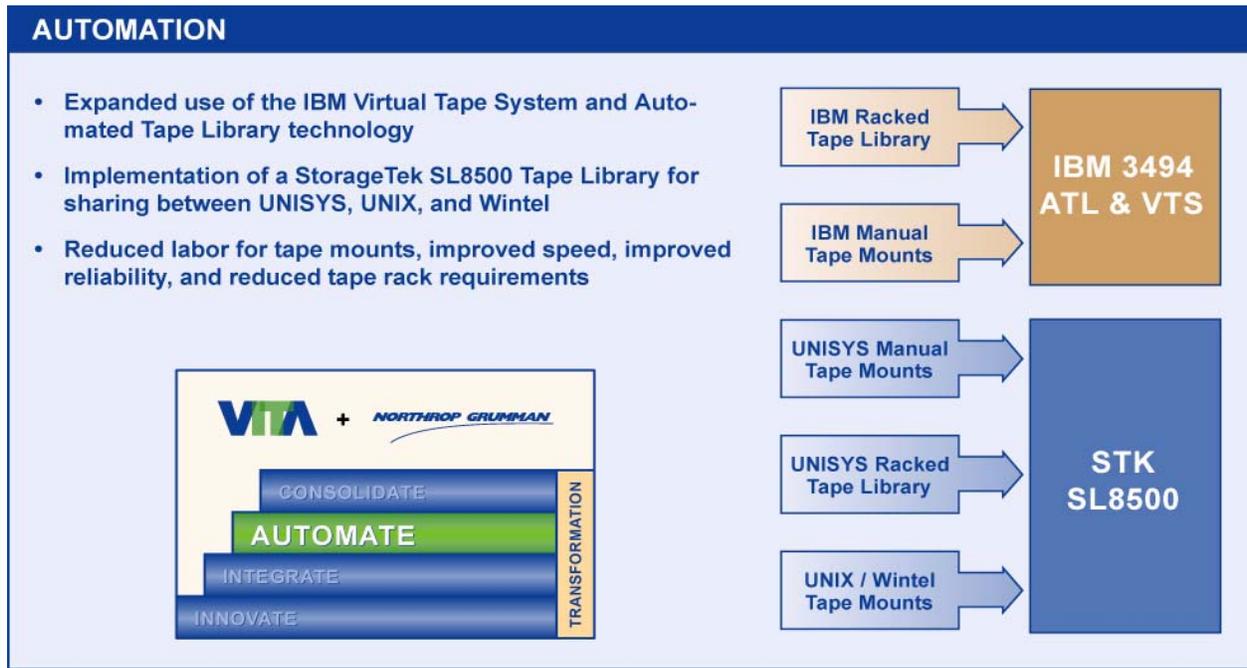


Exhibit 3 Automation

Northrop Grumman will move to higher-density tape media. During the Richmond Enterprise Solutions Center primary data center standup, standalone IBM 3590 and STK 9490 drives will serve as compatibility drives until media conversion is completed several months into transition. Detailed media conversion plans will be defined and will include both active data movement tasks and passive data expiration. This methodology will minimize complexity and mitigate risk while bridging from SunGard Continuity Services to internal disaster recovery services located at the Southwest Enterprise Solutions Center.

Consolidation

Exhibit 4 highlights Northrop Grumman's objective to address consolidation in Northrop Grumman's primary data center servers, Northrop Grumman's print service, and in the decentralized remote agency servers.

Server consolidation and storage consolidation will include physical deployment of equipment at the Richmond Enterprise Solutions Center. Printer consolidation will include deployment of redundant, high-volume laser and impact printers at the Richmond Enterprise Solutions Center. Northrop Grumman will provide output delivery to customers at remote locations, and remote print services will still be offered where required.

Collapsing Servers—In conjunction with physically relocating servers to a single location, Northrop Grumman can evaluate usage of existing file and print servers. Combining underutilized servers frees up hardware for other activities or decommissioning.

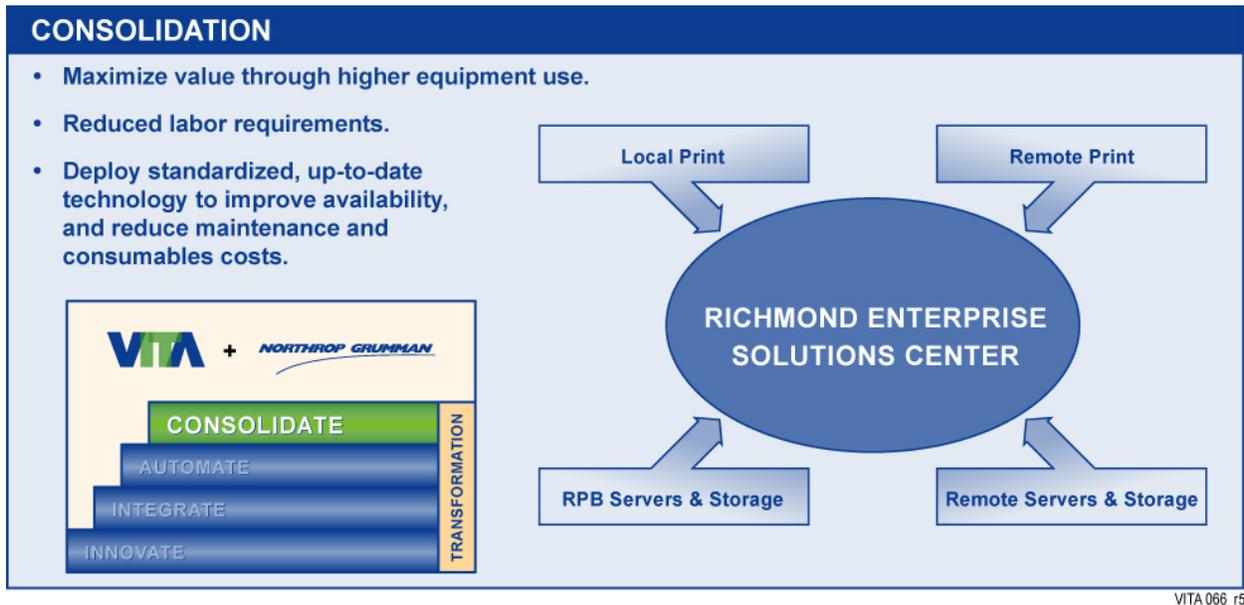


Exhibit 4 Consolidation

Virtualization—The use of new technologies for virtualization (VMware, HP-UX Virtual Partitions, and others) represents a change in data center operations and administration. Many benefits result from its deployment. Virtualization of servers has significant advantages as a method of consolidation in that it minimizes risk during consolidation. Since no actual operating system infrastructure is being changed or upgraded, applications and services are ported to newer hardware using the existing server image. Virtualization allows for a significant collapse of physical servers onto fewer hardware instances with little, if any, impact to users.

Once a server becomes a virtual server, it has a less complex upgrade path for hardware. Standard target hardware configurations, combined with existing virtual images, minimize the modifications required for device drivers across potentially thousands of virtual machines.

The use of administrative tools such as VMware’s VirtualCenter and VMotion allow moving a running virtual image from a server with a nonfatal hardware issue, or a performance problem, to another server with little, if any, visibility to the user. This enables proactive hardware maintenance and resource use, resulting in less downtime.

Blade Technology—The fundamental idea behind blade servers is consolidation. By allowing servers to share resources provided by a single chassis—such as network connections, power, and cooling fans—the individual servers can be made much more compact. Northrop Grumman will implement blade technology to:

- Reduce space requirements
- Reduce energy consumption
- Improve server management

Storage Management—Northrop Grumman will deploy high performance, high availability disk solutions that feature redundant design and redundant array of independent disks (RAID) to

minimize the risk from hardware failures. Approaches will consolidate the existing mixed architectures that exhibit vastly different performance, availability, and management characteristics, to a core set of SAN-attached subsystems with standard characteristics of performance, availability, provisioning, monitoring, and functionality. Internally, subsystem specifications will be tailored for individual platform use with respect to physical drive size, RAID configuration, and connectivity.

Print Management—The consolidated print center at the Richmond Enterprise Solutions Center will be equipped with standardized, high-volume, current technology printers of comparable function to those installed at the Richmond Plaza Building and Commonwealth agencies today. Plain cut-sheet paper, impact paper and consumables will be centrally managed and provided. Forms will be provided by VITA and Commonwealth agencies, but securely stored, audited and managed centrally if desired by the customer. Delivery of output from the Richmond Enterprise Solutions Center to customers within and outside the Richmond metropolitan area will be by courier or United States Postal Service (USPS). Northrop Grumman will assist VITA in output transformation during transition by re-baseline printing requirements and outlining a phased consolidation plan of remote printing by agency, where desired. Northrop Grumman will work with VITA through transition on identifying opportunities and solutions to advance the use of cut-sheet laser printing over impact printing by applications.

Centralization of Staff—Northrop Grumman will centralize operations staff as appropriate to enable more effective use of personnel, improve collaboration, and promote more cross-training opportunities across platforms.

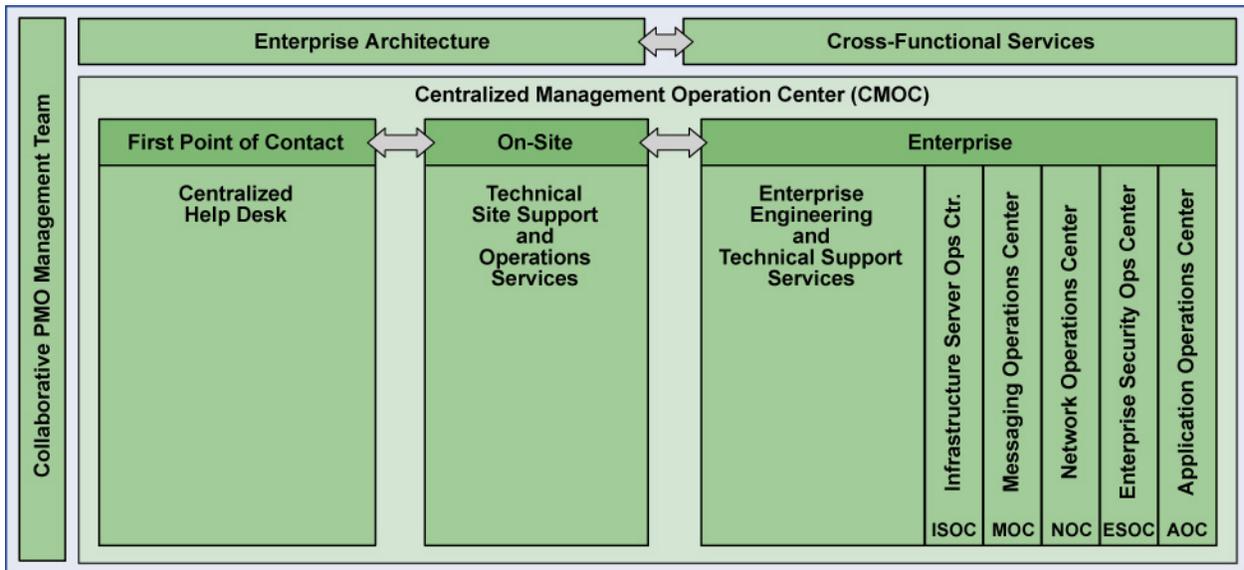
Transition

Northrop Grumman will work with VITA to develop and execute a transition plan that includes:

- Acquiring and installing the server infrastructure equipment in the new Richmond Enterprise Solutions Center as soon as building occupancy is approved
- Training technical and operational staff
- Establishing the CMOC that will be the hub for delivery of managed services. Transferring operational functions
- Executing the migration plan for the phased migration of the Richmond Plaza Building workloads to the Richmond Enterprise Solutions Center
- Deploying the HP OpenView Enterprise Systems Management framework
- Standing up the hot site disaster recovery environment at the Southwest Enterprise Solutions Center. Relocating, reconfiguring, and recertifying selected assets from the Richmond Plaza Building, as well as installing additional equipment
- Automating console and tape operations
- Deploying the management dashboard and customer-facing user portal for real-time visibility into the new computing services and knowledge base

The Northrop Grumman solution includes:

Centralized Management Operation Center—The CMOC, is depicted in **Exhibit 5**. Mainframe and Server Services are managed under the Infrastructure Server Operations Center, which is one of five centralized monitoring centers. A key feature is the extensive use of automation for service optimization and correction to provide 24x7x365 health and performance of the IT infrastructure.



VITA 192_r2

Exhibit 5 CMOC – Centralized Management Operations Center

Mainframe and Server Disaster Recovery—Northrop Grumman will use the Southwest Enterprise Solutions Center as a hot site to internally support mainframe and server disaster recovery operations.

This technical approach will support recovery in hours, not days, and meet VITA’s requirement for electronic vaulting. Off-site tape media vaulting will continue as a failsafe and for local data recovery.

Northrop Grumman uses a well-defined mobilization plan along with disaster recovery methods for integrated platform testing to achieve high success rates on disaster recovery tests. As depicted in **Exhibit 6**, advanced disk replication technology is a key component that will manage the once-daily remote duplication. Only data that has been changed is copied.

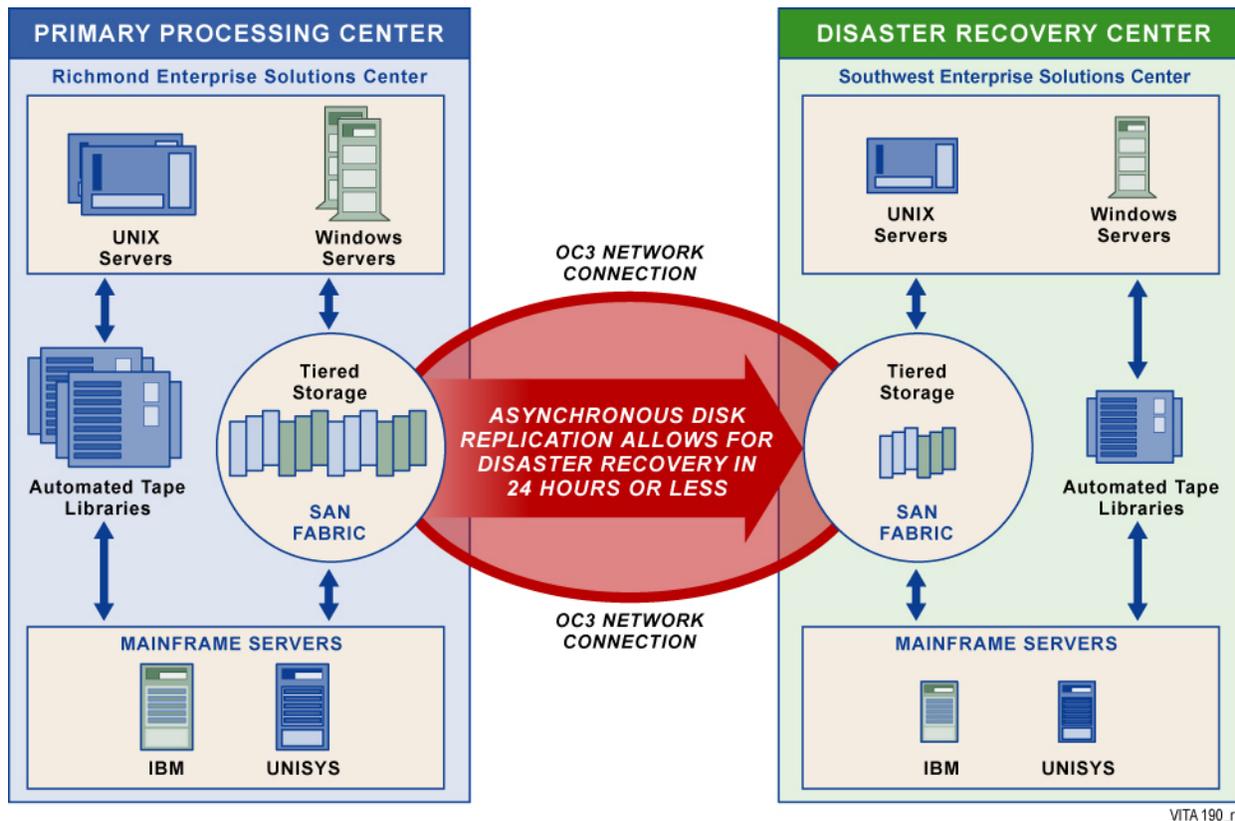


Exhibit 6 Mainframe and Server Disaster Recovery

Northrop Grumman’s storage subsystem approach will exploit point-in-time copy functions to provide a consistent backup is taken for the electronic and physical (tape) vault.

The Southwest Enterprise Solutions Center will be configured to support a rigorous recovery strategy. Northrop Grumman anticipates that Windows, Unix, and other distributed platforms will require recovery of approximately 10-20 percent of the production environment; the intent is to recover via a preconfigured environment exploiting server virtualization and partitioning.

Mainframe equipment requirements will be largely satisfied by relocating selected equipment that is currently installed within the Richmond Plaza Building. The older Virginia Department of Agriculture and Consumer Services (VDACS) mainframe will continue to be backed up onto tape. Future improvements for VDACS recovery will be reviewed with VITA during transition.

Mainframe Processor—Northrop Grumman will host VITA’s IBM z/OS mainframe systems on IBM z/Series 990 family processor. Enhancements including Fiber Connectivity (FICON) and Gigabit Ethernet connectivity will deliver access to storage, tape and network resources.

Mainframe Transition— The mainframe transition will focus on the following platform-specific objectives:

- Achieving value from VITA’s investment in tape automation by converting manual tape operations into robotic operations, and by integrating multiple platforms into the same tape storage approach.

- Simplifying storage management by consolidating processing environments to a single storage subsystem that can be expanded and reconfigured as the requirements change
- Consolidating remote print operations to a Print Center located at the Richmond Enterprise Solutions Center.

Server Transition—Northrop Grumman will transition VITA to a new model for operating and supporting its server platforms:

- Creation of standard images for installation
- Physical consolidation of servers and personnel to a single location
- Server collapse, especially file and print (except where not architecturally, operationally or financially viable)
- Virtualization of servers
- Refreshing technology

The server transition will focus on platform-specific activities to transition VITA to a new model for operating and supporting platforms:

- Developing, validating, and deploying a set of standardized server images
- Collecting application profiling data to shape the server consolidation plan to validate estimated ratios for virtual-to-physical hosting
- Performing remote agency server consolidation to the optimal stand-alone, virtual, or blade server environment
- Refreshing servers on a lifecycle that brings together consolidation schedules with the anticipated introduction of new technologies

Operations Management

Northrop Grumman will implement a support model, using performance-based metrics, built on ITIL methodology and practices to meet VITA's service level objectives. Northrop Grumman's approach includes:

Enterprise Systems Administration—

- Operating system (OS) and server evaluation
- Design/compatibility testing
- Infrastructure planning
- Desktop integration
- Disaster recovery planning
- User moves, adds and changes
- User and group rights administration
- Server backup and restoration

- System monitoring
- Event log management
- Virus protection management
- Print queue management
- OS and hardware installation and upgrades
- OS and hardware maintenance (including patch management)
- Advanced problem determination
- Security management
- Performance, partition, and workload management
- Storage management

Configuration and Release Management—Northrop Grumman will provide enterprise systems administration. Releases of hardware and software will be tracked. Version and release control will be followed to protect quality and integrity of the environment.

Job Scheduling—Job scheduling will be performed using automated job scheduling software and automation tools installed and supported by Northrop Grumman. Northrop Grumman will work with VITA to automate job schedules. Guidelines will be developed in accordance with release management processes to define the requirements for jobs to be considered production schedule ready. This will include batch, online, and electronic data interchange format (EDIF) processes. Job execution profiles and failure trends will be analyzed to reduce subsequent failures, and improve run times and application integrity.

Database Administration and Middleware Support—Northrop Grumman will adhere strictly to VITA's defined policies when executing authorization requests, schema, definition, and object changes, and installs, moves, add, changes (IMACs). Northrop Grumman will perform ongoing database space monitoring, message broker monitoring and load balancing, and storage management where required. Northrop Grumman will manage business continuity database backups for both disaster and local recovery.

Media Operations Support—Northrop Grumman will use tape management products for managing the tape resources dedicated to the mainframes and the server tape environment. Northrop Grumman will document and maintain tape management procedures in an operational procedures manual.