

11.3.8 Details on the Mainframe & Server Services Proposed Solution

11.3.8.1 Mainframe Services

The Commonwealth Partners' approach to VITA's mainframe environment combines sound project management and the newest technologies for a logical, planned transition of VITA's processes and people to an IBM service delivery model. Our vision is to leverage the processes that are currently supporting the infrastructure and enhance them with IBM best practices and processes.

We recognize the skill level and quality of the staff currently running the VITA operation and they represent a tremendous amount of institutional knowledge, which we expect to take advantage of for this program. Our transition effort anticipates a majority of the current staff becoming part of the Commonwealth Partners service delivery team. The critical success factor of the transition is to ensure that the effort is as transparent as possible to the End-User community.

Current day-to-day operations will not significantly change in the first 30-60 days. Experienced Commonwealth Partners team members will investigate, analyze, document, and recommend various actions to enhance service delivery. We will jointly review the recommendations with VITA, and Commonwealth Partners will implement the resulting changes to the VITA environment.

Our solution design efforts have focused on addressing the Statement of Work requirements while providing the lowest possible total cost of ownership to the Commonwealth. Based on our understanding of base case data and existing Commonwealth supplier agreements, we compared and contrasted our national supplier agreements and the Commonwealth's negotiated agreements. We found that the Commonwealth has successfully sourced hardware and software at significant discounts, particularly from a number of Independent Software Vendors and Unisys. Our recommendation is to take advantage of the most competitive costs, whether negotiated by the Commonwealth or IBM. In that spirit, we are proposing the following approach to VITA and IBM ownership of assets:

- **Commonwealth Retained Software.** Based on Due Diligence, we have concluded that the Commonwealth discounts offer distinctive cost advantages for a sub-set of software vendors. We propose that the Commonwealth retains financial responsibility for software licenses except for IBM (including Candle) and Computer Associates branded software products. IBM can optionally offer additional services as the Commonwealth's paying agent through Change Management Procedures.
- **Commonwealth Retained Hardware.** VITA retains ownership of the in-scope mainframe hardware at the beginning of this agreement. IBM will take ownership of the equipment at refresh time of all hardware assets except those associated with the Unisys mainframe. The refresh is planned to coincide with the migration to the new Data Center. Optional pricing option is offered that allows IBM to take ownership of the hardware assets at the beginning of the contract.
- **Vendor Hardware and Software.** This is a list of products that we will provide as part of our provision of in-scope services.

To achieve a desirable level of standardization and cost efficiency, we have targeted a small number of BMC software products that we intend to migrate to IBM products that deliver similar function. By standardizing we realize savings through software license and labor efficiencies. This migration of software products will be completed by the end of calendar year 2006.

The Commonwealth Partners are responsible on the first day of the relationship for the performance of the mainframe environment. We will measure and report the performance metrics for the various systems/procedural components currently being measured. To the extent there are tools and procedures currently being used, and in place, on the first day, the Commonwealth Partners will perform to the

demonstrated service. If no tools or procedures are in place during this phase, the Commonwealth Partners will investigate and bring appropriate tools to VITA's attention and jointly agree on the implementation of such tools or procedures. Once implemented and demonstrated, the Commonwealth Partners will perform to or exceed the agreed-upon Service Level.

The IBM MVS system will be upgraded from the z900 model 1C6 to a z990-303 model. The z990 series is IBM's most recent mainframe family of servers. IBM will coordinate implementation activities for the Commonwealth provided Unisys C7802 replacement machine to provide the technology and capacity required in supporting the baselines found in Section 10 of this document. The MVS data storage will be consolidated onto IBM DASD at the new Data Center. The Unisys storage will continue to reside on EMC drives. The tape solution and the network will migrate to the new Data Center as well.

Our overall view of this workload migration from the current data center to the new one is based on minimizing both the cost and the risk of the activity. We have worked to minimize bubble equipment and more risk-laden activities. The migration effort will include cut-over testing, acceptance, and sign-off checkout procedures.

The migration to the new Data Center is tentatively scheduled for Labor Day weekend of 2007. We will work with VITA to minimize planned outages to accommodate the workload migration and cutover from the Richmond Plaza Building to the new data center in **Redacted**. Detailed plans for the migrations will be developed and impact to critical Commonwealth business processing will be minimized with consideration given to balancing business impact and cost.

System changes introduced into the environment will be handled in accordance with the Procedures Manual and will be as transparent to the End-User community as possible.

Disaster Recovery

The Commonwealth Partners have assembled a low-risk approach to continue the Disaster Recovery (DR) coverage currently in place. IBM will assign a Disaster Recovery Coordinator to schedule recovery test exercises annually during the term of the Agreement. Following each test exercise, an action report will be developed, lessons learned evaluated and action plans will be developed in preparation for the next scheduled exercise.

We propose that the Commonwealth retain its relationship and contractual agreements with SunGard for the period from the Service Commencement Date through migration to the new Data Center. If SunGard is unwilling or unable to extend coverage IBM will assist the Commonwealth in securing tape subscription services from IBM's Business Continuity Recovery Services organization.

IBM evaluated the costs associated with building a backup center dedicated to the Commonwealth processing. In the interest of proposing the most cost effective solution, we propose IBM Business Continuity and Recovery Services (BCRS) to satisfy the requirement for the backup center. The recovery services will accommodate the hardware, software and connectivity needed to operate the Commonwealth's environment for purposes of business recovery testing and, if necessary, recovery.

After the termination of SunGard services, IBM will provide tape subscription services. IBM has managed disaster recovery services through more than 10,000 worldwide client contracts – many with distributed configurations and mainframe environments similar to those in the Commonwealth. Our proposal offers the optimum combination of Commonwealth Partners expertise, technical capabilities, best practices and cost effectiveness for Disaster Recovery in reducing risk to the continuity of the Commonwealth's business operations.

In the event that the Commonwealth experiences an outage emergency, the Commonwealth would declare a disaster by calling the toll-free number IBM provides. IBM will begin to prepare the recovery site

without delay. The Commonwealth will have immediate access to the recovery site. IBM will use commercially reasonable efforts to provide the recovery site infrastructure for the environment as soon as the Commonwealth is ready to use it and will provide it no later than twenty-four (24) hours after the disaster declaration.

Prior to migration to the new Data Center, IBM will perform a Business Impact Analysis (BIA) to better understand the Commonwealth's disaster recovery requirements. The results of the BIA will quantify the business risk/cost analysis associated with the business functions to be recovered, recovery time and recovery point objectives and may result in changes to the Disaster Recovery Plans and procedures.

We will continue with the 72-hour restoration target time for the mainframe environment. We will work with the Commonwealth to understand the impact of implementing BIA recommendations through Change Management Procedures.

We used the BIA Categories provided in Appendix 1, Schedule 3.3, Section 4.3.2 to guide our preliminary design of the midrange disaster recovery solution. A primary result of the BIA study will be to properly categorize applications to the coverage level required. A rate card approach may be taken to provide costs of coverage by BIA category.

The rate card may have multiple cost components:

- Cost of the processor required on the floor (if the recovery objective is aggressive) and the cost for environmental and support
- Labor to include the incremental cost of the Disaster Recovery Coordinator, the time and travel costs for systems support of one test per year, and the labor to keep the operating and systems support software up to date
- Incremental cost of additional bandwidth required
- Cost of the GB stored at the recovery site

Our expected design point for rate card development will be that all covered systems include one disaster recovery test per year. Additional disaster recovery tests, within each BIA recovery category may be accommodated at additional charge.

11.3.8.2 Distributed Server Computing

Server Solution and Management

The Commonwealth Partners' full-scope approach to distributed server computing includes management of the Commonwealth's distributed server environment. Our plan includes physically consolidating the majority of distributed servers into a centralized Data Center. Commonwealth Partners will continue to manage server operations at the existing server locations through a combination of remote and on-site services. Figure 11.3.8.2-1 illustrates the services included in our total server solution for the Commonwealth.

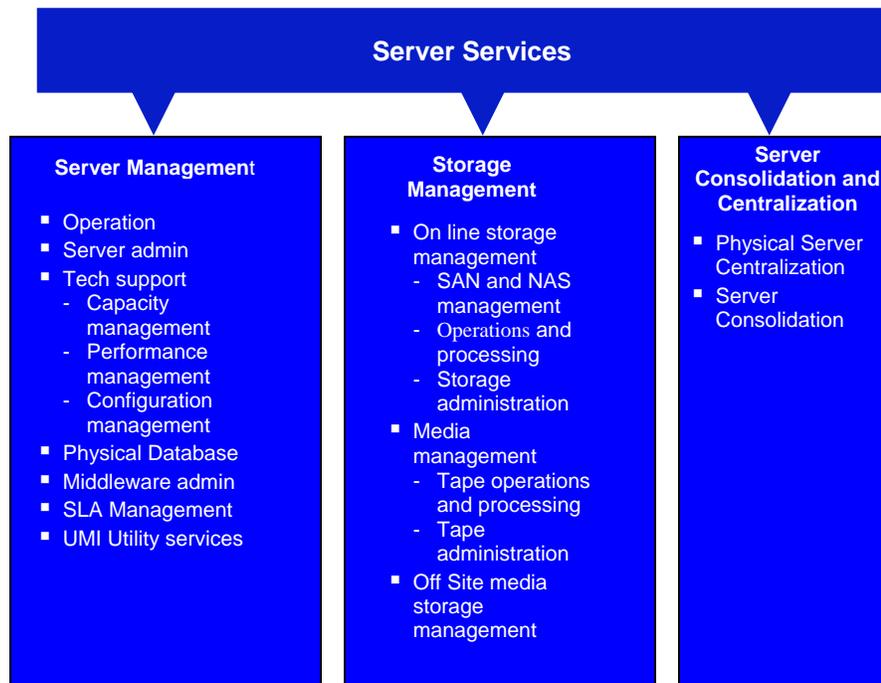


Figure 11.3.8.2-1 - IBM/Partners' Server Solution Overview

The Commonwealth Partners' managed support is designed to provide proactive monitoring of servers, day-to-day system administration, and fast problem resolution. Operations staff in **Redacted** will provide this server monitoring and management for servers statewide. These functions include:

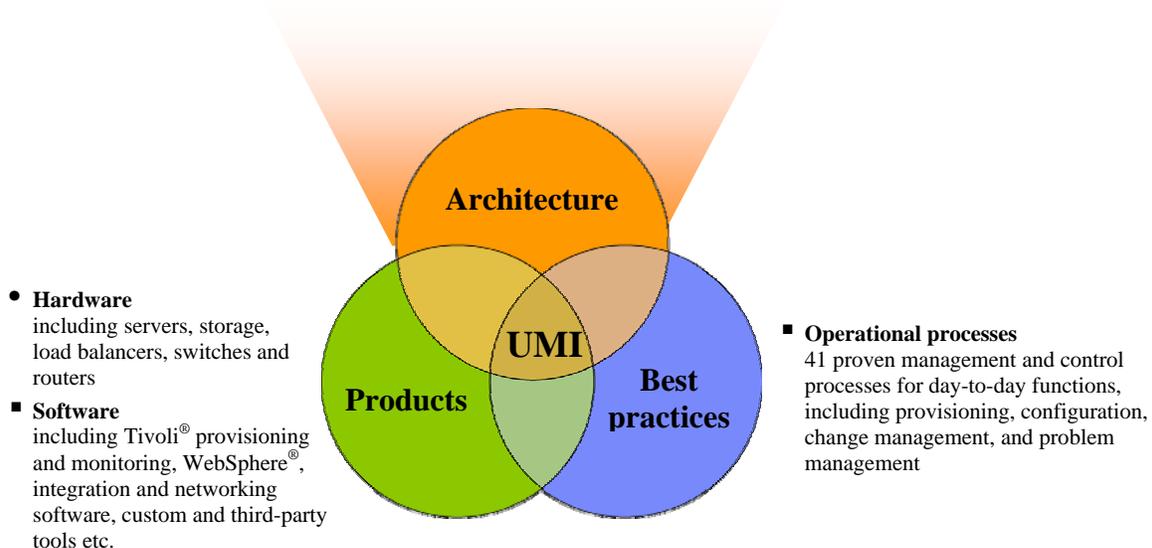
- Performing production control and scheduling
- Providing batch job administration
- Monitoring scheduler related incidents, and developing and recommending changes to the scheduler database
- Defining rules to send automated alerts on critical application jobs to Commonwealth key individuals via pager
- Performing systems software component restart ;contacting the appropriate system software support groups for systems software problem resolution as required
- Sending automated alerts on system critical events to the Commonwealth Partners delivery team and Project Office

Site services such as media handling and physical problem determination will be provided in each location by individuals supporting both server and Desktop Computing requirements.

Technical Support

Commonwealth Partners proposes implementing IBM's Universal Management Infrastructure (UMI) to create an integrated technical support toolset. We will capture the data that is generated by the UMI agents on the infrastructure devices and direct it to Tivoli Enterprise Console (TEC).

A key feature of UMI is that it supports multi-platform server environments that are characteristic of today's data centers, including HP-UX, IBM AIX, Linux, Microsoft Windows and Sun Solaris. UMI is an integration of IBM products (hardware and software), architecture and best practices, consolidated into a range of solutions to help build and manage a utility-based IT environment.



How will UMI benefit the Commonwealth?

UMI Function	Benefit to Commonwealth
Configuration of provisioned resources—Allows IT administrators to define new resources and remove, reconfigure and manage existing resources	Gives the Commonwealth the flexibility to dynamically change the computing environment based on changes in user demands.
Operating system and application patches and upgrades—Allows IT Administrators to solve problems and perform maintenance through quick and easy deployment of required patches (software corrections)	Rapidly deploy patches to the environment via software auto provisioning
State full configuration management – maintains a database of server and application configurations for each server managed by UMI	Rebuild or provision servers rapidly. In addition, if a server needs to be rebuilt because of a failure, the configuration data is restored via UMI and the server is rebuilt to the last working configuration.
Auto Provision – the ability to provision resources on demand.	Provides the ability to define certain thresholds in the environment. When a threshold is reached, UMI can auto provision additional resources.

IBM's provisioning software, called Tivoli Intelligent Orchestrator, enables groups of servers to automatically add computing power to jobs that need it or subtract it when demand dies down. In addition to the UMI tools and practices, the technical support toolset includes Virtual System Administrator (VSA) as well as the full suite of IBM Systems Management Controls disciplines to provide monitoring and

alerting, performance and capacity planning, and console operations. During Transition, IBM will deploy a consistent Enterprise System Management Infrastructure. IBM will leverage the Tivoli Infrastructure, e-Enterprise Infrastructure Management (EIM), and Enterprise System Management (e-ESM) to provide a complete Enterprise Infrastructure, which is detailed in the following graphic (Figure 11.3.8.2-2).

Enterprise Systems Management Architecture

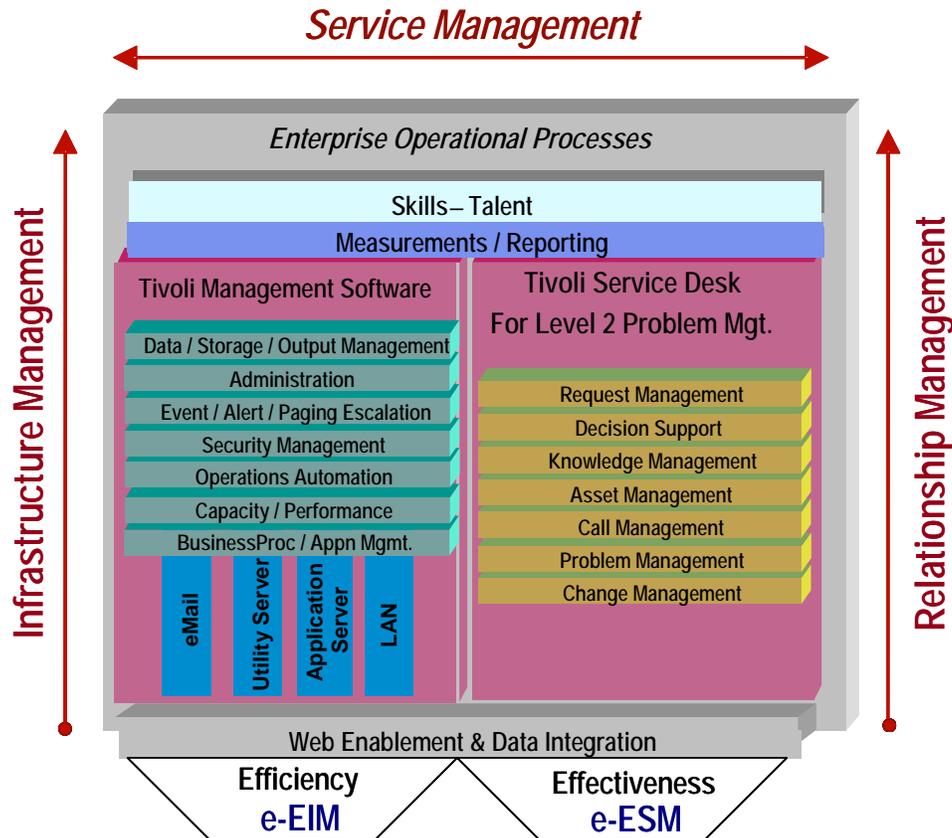


Figure 11.3.8.2-2 - IBM’s Enterprise Systems Management Architecture provides a single console interface across platforms, enabling consistent, end-to-end event management.

Commonwealth Partners will implement our Virtual System Administrator (VSA), also a component of UMI. This is a new addition to IBM’s suite of tools and was developed to streamline and automate systems administration tasks such as: patch management, script management/software distribution, anti-virus management, log management, health checking, systematic attack prevention, capacity monitoring, reporting, and tracking. The tool is tightly coupled with processes for timely response and management of these tasks.

Technical support will:

- Install new operating system releases
- Install vendor-provided fixes to system software

- Work with the applications community to determine when it is appropriate to upgrade non-OS system software
- Manage operating system and system software configurations
- Modify configuration files
- Document system configurations
- Control access to system configuration files
- Define capacity related alerts
- Collect, track, and perform trending analysis of capacity statistics
- Perform strategic planning of system capacity
- Proactively balance resources and workloads
- Analyze changes to determine capacity impacts:
 - Define and maintain performance alerts
 - Define performance report formats
 - Balance and tune IT resources and workloads
 - Analyze change requests from a support performance perspective, as requested
 - Collect performance statistics
 - Respond to alerts
- Manage the resolution of performance issues

The e-EIM infrastructure allows for a global monitoring solution with a central command center hub using the Tivoli framework. The entire global infrastructure can be centrally managed and will share common-rule databases, database implementations, management tools, and remote control. System Management and availability events from multiple sources will be integrated into a global hub SuperTEC (Tivoli Enterprise Console). The e-ESM infrastructure provides a single framework that integrates Problem Management, Change Management, and Asset Management into a common repository.

Commonwealth Partners will implement Server Resource Manager (SRM). SRM serves as a standalone 'Data Mart', specializing in performance and capacity planning reporting and metrics for Server and LPAR (logical partitioned) processing assets. Data is centralized from various platform-specific data sources and housed in a central repository.

Storage

The Commonwealth Partners will support the Commonwealth's SAN environment. During the first three (3) years of the contract, through technology refresh, IBM will standardize on IBM storage technology for SAN and NAS storage.

Storage management support includes the following:

- Identifying and maintaining the appropriate threshold levels to reduce potential space constraints

- Communicating disk space availability, space-related problems, and areas of potential problems
- Data movement
- Creating and maintaining plans for system and user catalogs and for incremental and full-volume backup and recovery
- Recommending efficient block sizes, migration criteria, and other parameters that affect DASD usage and capacity
- Online Storage Management
- External Storage Media Management
- Off-Site Media Storage Management
- Change Management Support
- Backup and Recovery Services

Transition and Transformation

Figure 11.3.8.2-3 is a high level schedules of transition of the Commonwealth servers to the new data center. It also includes hardware refresh projects target timeframes. The Commonwealth Partners plan to start server consolidation and hardware refresh in Month 7. The project will run for 2.5 years, at which time the majority of the Commonwealth’s servers will be refreshed and centralized in the new data center.

Server Computing Timelines

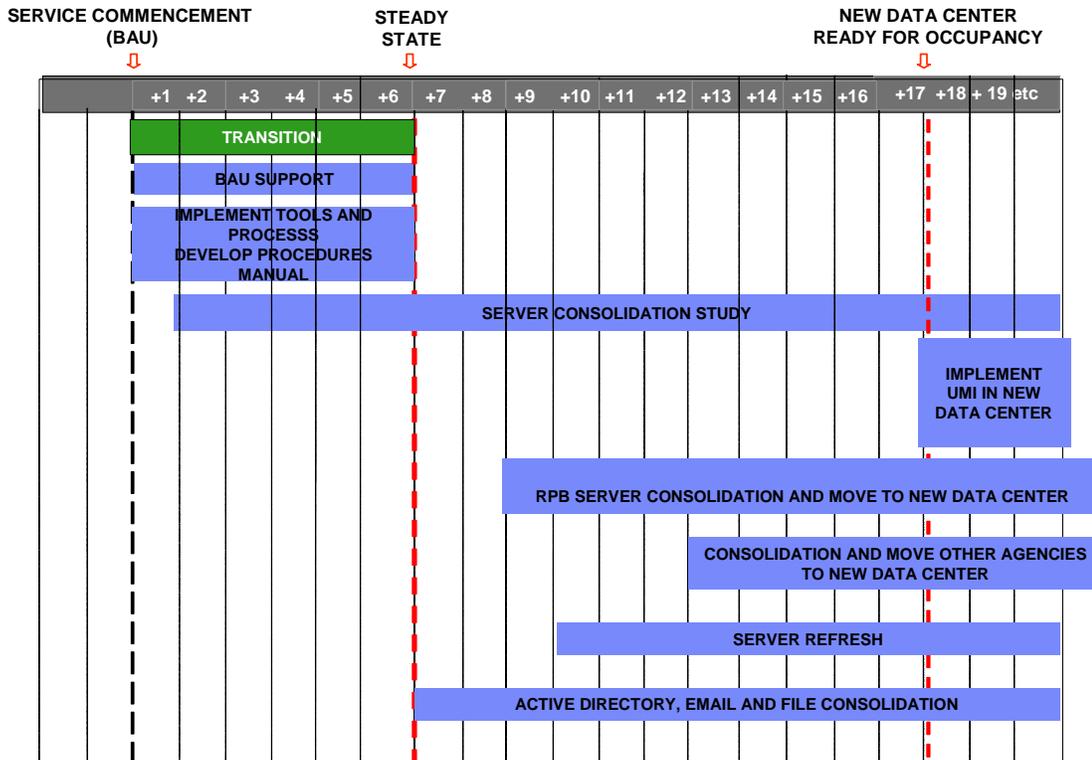


Figure 11.3.8.2-3 - Server Computing Transformation Timelines

The Consolidation and centralization approach is outlined below.

Consolidation and solution approach

The server solution approach for the Commonwealth took into consideration the Due Diligence findings:

- Servers are highly distributed across many locations
- Multiple hardware platforms
- Multiple process and procedures.
- Duplication of infrastructure servers across agencies (i.e. Backup recover, Domain, Tools).
- High number of file/print and infrastructure servers



- No centralized tools across all agencies
- Multiple email products across agencies

The Commonwealth Partners reviewed the current Commonwealth server environment and observed a high level of duplication across agencies. During Due Diligence, the Commonwealth Partners determined that redistributing them into four logical groups would produce very specific benefits, as shown in the tables below:

1. File/Print Servers – File Storage Servers and Print Servers

Observation	Solution	Result	Benefit
<ul style="list-style-type: none"> • Each agency had provisioned file / Print servers to support their respective end users. There was no sharing of resources across agencies 	<ul style="list-style-type: none"> • Consolidated all file servers into main data center where all agencies can leverage the same server clusters and SAN infrastructure 	<ul style="list-style-type: none"> • Reduces the overall operating costs for file operations 	<ul style="list-style-type: none"> • Reduced the number of file/print from 670 servers to approximately 200 servers. • Provides more flexibility when managing file resources

2. Infrastructure Servers – Back-up recover, tools, DNS, Domain Services

Observation	Solution	Result	Benefit
<ul style="list-style-type: none"> • Each agency had provisioned infrastructure servers to support their respective agency. • There was no sharing of resources across agencies 	<ul style="list-style-type: none"> • Consolidate the majority of infrastructure server so they can be leveraged across agencies 	<ul style="list-style-type: none"> • Gives the Commonwealth a higher ROI on infrastructure services 	<ul style="list-style-type: none"> • Reduces the overall operating costs for file operations • Gives the Commonwealth more flexibility when managing infrastructure • Standardization of infrastructure components that reduce management complexity



3. Email Servers

Observation	Solution	Result	Benefit
<ul style="list-style-type: none"> Each agency had provisioned email services to support their respective end users There was no sharing of resources across agencies 	<ul style="list-style-type: none"> Consolidated all email servers in the new data center. Migrate all users to a like email platform 	<ul style="list-style-type: none"> Reduces the number of email servers from 228 to approximately 100. 	<ul style="list-style-type: none"> Reduces the overall operating costs for email operations. Enables VITA to offer an email utility server to their customers Reduce complexity through standardization

4. Web, Application and Database Servers

Observation	Solution	Result	Benefit
<ul style="list-style-type: none"> Highly distributed server environment There was no sharing of resources across agencies Low utilization of server hardware When a new application is required a physical server is stood up to support it 	<ul style="list-style-type: none"> Perform a physical Server consolidation and image elimination Drive server utilization up on hardware through server virtualization Provision LPARs when additional server images are needed 	<ul style="list-style-type: none"> Gives the Commonwealth a higher ROI on server hardware Decrease deployment time for new server resources due to LPAR technology. Provides greater flexibility in management computing resources across the commonwealth 	<ul style="list-style-type: none"> Reduces the overall operating costs for file operations. Reduces hardware cost though virtualization of the server hardware Standardization of server components that reduce management complexity which lower total costs.

Through our technology refresh, servers are replaced with hardware that supports logical partitioning and virtualization. This minimizes the hardware footprint while maximizing utilization. Our experience shows that in environments similar to the Commonwealth, UNIX servers, overall, have a monthly 24-hour average utilization of about 10%-15%; while Intel based servers have utilization on the order of 5%-10%.

The Commonwealth Partners' server consolidation approach enables us to significantly increase the application density per server. With logical partitioning, we are able to move applications into their own virtual server environment where they share physical resources with other partitions. This increases the overall utilization of the physical server allowing us to recapture the unused capacity. The Commonwealth Partners are using this approach during the consolidation of servers as we transition the Commonwealth into the new Data Center.