

U.S. Environmental Protection Agency

DATA CENTER CONSOLIDATION PLAN



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1 Introduction

Since 2007, EPA has led a series of successful initiatives embracing data center consolidation, industry best management practices and virtualization across its data centers. Over the past three years, EPA consolidated small data centers and server rooms in various locations across the country with plans to gain more efficiencies. Virtualization is already used extensively to support database hosting, and EPA is expanding virtualization to support Web and application servers. The Agency completed a phased virtualization program across its primary data center that included optimizing the efficient use of floor space and turning off air handlers. And EPA is hosting more than 200 individual Agency business applications in an innovative, shared hosting environment offering many of the features of private cloud services.

EPA is a physically decentralized organization with 25 major facilities, including EPA Headquarters (DC Metro Area), EPA Research Triangle Park (RTP) research center, 10 EPA regional offices and 13 major research centers. The remaining facilities are smaller field offices and continuity of operations (COOP) sites. Seventy-eight data centers and server rooms¹ are located in 66 buildings across 48 cities in 31 states and territories. EPA's primary data center is the EPA National Computer Center (NCC) located in RTP, North Carolina.

EPA's enterprise application hosting is highly centralized: 19 of 21 EPA Capital Planning and Investment Control (CPIC) major applications and 66 of 82 non-major applications are hosted in a highly virtualized, shared services context at the NCC. Because EPA enterprise applications are already consolidated to a single data center, EPA's consolidation plan focuses on achieving efficiencies via virtualization within EPA's four primary data centers and the smaller server rooms that service local productivity and business support services for EPA Headquarters, regional offices and research laboratories.

E-mail is the only enterprise application currently hosted on distributed servers. EPA's regional offices, research centers, labs and field offices host local infrastructure services (Tier I and Tier II data centers), such as file and print services, specialized lab and research support, local program implementation, emergency response (ER) and COOP. Most data centers and server rooms provide localized computing services or specific scientific computing services (e.g., laboratories), making further consolidation challenging. The distributed nature of EPA's offices and the costs associated with long distance, high-speed network connectivity require EPA to balance data center consolidation with network cost and reliability factors.

2 Agency Goals for Data Center Consolidation

EPA's current initiatives seek to achieve the following goals:

- Designate four primary data centers for enterprise applications.
- Establish private cloud services for enterprise application hosting within the four primary data centers.
- Consolidate Agency e-mail hosting to the four primary data centers in Washington, DC; Denver, CO; Chicago, IL; and Research Triangle Park, NC.
- Establish enterprise public cloud services for EPA applications using approved cloud providers under General Services Administration (GSA) contracts.
- Consolidate servers from 78 campus level server rooms to 53 rooms by 2015. EPA's major campuses will have a medium-sized server room and other locations will have at least one small server room.
- Standardize and maximize server virtualization across EPA data centers to reduce the number of physical servers by approximately 50 percent and achieve a target of 1,000 physical servers by 2015.
- Align server replacement with consolidation activities.
- Establish service level agreements, operating level agreements and performance standards to deliver server room and data center services reliably.
- Refine standards for backup and disaster recovery (DR) capabilities supporting continuity of operations and emergency response capabilities.
- Incorporate green IT approaches across Agency data centers and server rooms to maximize data center and server room energy efficiency.

3 Implementing Shared Services/Multi-tenancy

EPA actively works to collaborate internally and across other Agencies to share services and resources. EPA's NCC provides hosting and/or DR for three federal applications.

- eRulemaking (www.regulations.gov) supports online rulemaking for nearly 300 federal agencies.
- BFEM: The U.S. Treasury's Budget Formulation and Execution Manager (BFEM) provides shared application services for government-wide tools to track the budget formulation process for use in planning and analyzing the budget.
- OMB MAX System Disaster Recovery: EPA's NCC serves as the backup and DR site for the MAX Information System, which supports OMB's federal management and budget processes.

Additionally, EPA's financial and human resources management systems will be migrated to Federal Line of Business (LoB) providers.

- Financial Line of Business: EPA participates in the eGovernment initiative for the Financial Systems Line of Business and is in the process of migrating EPA's Integrated Financial Management System to a commercial LoB provider.

- Human Resources Line of Business: EPA participates in the eGovernment initiative for the Human Resources Line of Business. EPA's payroll systems were migrated to a Federal LoB provider in 2006. EPA is currently in the planning phase for the remaining EPA HR systems.

EPA currently implements a broad range of internal shared services and infrastructure to support secure IT operations across EPA server rooms, data centers and facilities nationwide.

- EPA's Wide Area Network (WAN) and internet connection services are managed centrally through commercial cloud services under GSA's Networx contract. All EPA server rooms and data centers leverage these services.
- EPA's network and security operations leverage a broad range of shared services across all agency server rooms and data centers.
- EPA's Trusted Internet Connection (TIC) services leverage GSA Networx commercial cloud services for Managed Trusted Internet Protection Services (MTIPS). All EPA server rooms and data centers connect to the internet through this shared resource.
- EPA's Computer Security Incident Response Capability (CISRC) services provide a centralized service for cyber security incident reporting, management and coordination across agency components and with the United States Computer Emergency Readiness Team (US-CERT) and other federal entities.
- EPA's enterprise configuration management services provide shared agency-wide service for server patching and configuration management across all EPA server rooms and data centers.
- EPA's enterprise vulnerability management infrastructure provides shared network-based discovery, server vulnerability identification and remediation tracking.
- EPA enterprise log management services provide a shared platform for log collection and analysis across all server rooms and data centers.
- EPA's enterprise resource monitoring services provide a common platform for information technology (IT) resource monitoring.
- EPA's enterprise service desk will use cloud services to enable more effective call center/help desk incident and problem management activities while taking advantage of basic economies of scale. The cloud model is expected to consolidate 12 existing agency IT help desks.
- EPA's enterprise identity and access management services provide shared identity, authentication and access control across all of the Agency's general purpose networks and a shared framework for authentication and access control.
- EPA's enterprise remote access services provide remote access for EPA server rooms, data centers and applications. EPA will transition these services to a commercial managed service under GSA's Networx contract in FY 2012.

- EPA's enterprise e-mail and collaboration are key platforms for consolidation and cloud migration. In FY 2012 EPA will consolidate e-mail hosting to its four primary data centers, migrate internet mail gateways to cloud services under GSA Networx, and launch enterprise services for Web conferencing and collaboration. EPA has also designated e-mail and collaboration for migration to cloud services beginning FY 2014.
- EPA's enterprise content management platforms provide a shared solution for agency-wide electronic records management. In FY 2012, EPA will implement a shared service for managing electronic records discovery.
- EPA's enterprise video conferencing services provide a shared video and teleconferencing service agency-wide.
- EPA's enterprise Voice over Internet Protocol (VOIP) project is migrating agency campuses to VOIP services and will consolidate VOIP hosting infrastructure in EPA's four primary data centers.

As EPA achieves consolidation of servers and server rooms across the Agency, the primary constraint on further consolidation will remain the need to have at least one server/telecommunications room at each physical location. Many EPA facilities are located in GSA-provided properties with multiple federal tenants. A key facilitator to further server room consolidation in these locations is the establishment of a GSA services framework to provide common server room resources within shared federal buildings and a standard access control and security framework to support the secure hosting of multiple federal agencies within common facility-wide server/telecom rooms.

4 Agency Approach, Rationale and Timeline

The basis of EPA's data center consolidation plan is its Computer Room, Server and Storage Management (CRSSM) initiatives. These initiatives focus EPA's near-term efforts on network augmentation, server virtualization and server room consolidation at local campuses, establishment of a private cloud infrastructure at four primary data centers, consolidation of e-mail hosting at these data centers, and establishment of enterprise commercial cloud services using GSA-provided cloud services.

EPA's mid-term efforts will establish centralized resources for COOP, DR and enterprise backup in the four primary data centers. With full implementation of these initiatives, EPA expects to realize several efficiencies:

- Minimize data center energy consumption.
- Minimize long-term growth in IT operations costs.
- Maximize server and storage utilization.
- Maximize standardization and agility.
- Reduce long-term growth of IT infrastructure costs.

EPA is pursuing the following activities to maximize efficiencies across the Agency's widely distributed geographic locations.

- A. Network Optimization:** EPA's network optimization was a fundamental prerequisite for server consolidation, as bandwidth is a critical risk factor for server migration. EPA's network optimization initiative leveraged the GSA Networkx contract to move EPA's Wide Area Network (WAN) and Trusted Internet Connection (TIC) services to commercial cloud services. EPA completed the initial transition in March 2010 and continues to expand the use of cloud services provided under this contract.
- B. Standardization and Enterprise Procurement:** EPA established standards and enterprise procurement for e-mail, virus protection, vulnerability management, directory services, asset management and patch management. In 2010, EPA established server and software standards for x86/64 virtualization platforms and established an enterprise platform for infrastructure monitoring. By 2013, EPA will evaluate and procure enterprise solutions for backup and disaster recovery, desktop virtualization and collaboration. These efforts will consolidate redundant software products to drive enterprise efficiencies in procurement, deployment and application administration.
- C. Local Optimization:** In 2009, EPA began migrating x86/64 servers to virtualized platforms. These virtualization efforts are paired with infrastructure refresh efforts so that they can be financed within existing operating budgets and maximize return on investment. Virtualization infrastructure is accounted for in the target reductions for the Windows, Linux and UNIX servers. EPA has achieved substantial gains in virtualization. Nine percent of physical servers are virtual machine hosts and 32 percent of EPA servers are virtual machines. By 2015, the Agency plans to increase virtual hosts to 30 percent of physical machines with 60 percent of EPA servers operating as virtual machines.
- D. E-mail Optimization:** EPA's e-mail optimization will consolidate e-mail from over 180 Lotus Notes servers distributed across 45 locations to a private cloud infrastructure across its four primary data centers. This initiative modernizes, standardizes and improves EPA's e-mail service; achieves substantial reductions in servers, storage and energy consumption; and facilitates migration to external cloud services beginning in 2014. In 2012, EPA will migrate its e-mail internet gateway services to AT&T's cloud services under GSA's Networkx contract.
- E. Enterprise COOP and DR:** The goal of enterprise COOP and DR is to provide for the COOP and DR services using shared services that are hosted in the four primary data centers. COOP and DR services are currently provided using site-specific solutions. Enterprise COOP and DR services must provide remotely accessible data and applications to support continued operations and emergency response to EPA regions or field offices. The initial provisioning of enterprise COOP and DR at the four primary data centers by 2013 is a key component of EPA's data center optimization and server reduction strategy.

The table below provides the current schedule for server room consolidation through 2015.

EPA Data Center Consolidation Plan

| No. | Agency Component | Data Center | Location | Action to be taken | Action Taken during Calendar Year |
|-----|------------------|--|-------------------|---------------------------------|-----------------------------------|
| 1 | EPA OECA NETI | R08-LKCO-NETI 117 Campus Server/Telcom Room | Lakewood, CO | Servers moved or Decommissioned | 2011 |
| 2 | EPA Region 03 | R03-WHWV-Chapline St 409 Campus Server/Telcom Room | Wheeling, WV | Servers moved or Decommissioned | 2011 |
| 3 | EPA Region 05 | R05-WLOH Campus Server/Telcom Room | West Lake, OH | Servers moved or Decommissioned | 2012 |
| 4 | EPA RTP CAMPUS | RTP-RTPNC-N147 Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 5 | EPA RTP CAMPUS | RTP-RTPNC-C160 Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 6 | EPA RTP CAMPUS | RTP-RTPNC-C131 Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 7 | EPA Region 10 | R10-ANAK-Anchorage Fed Building Campus Server/Telcom Room | Anchorage, AK | Servers moved or Decommissioned | 2012 |
| 8 | EPA Region 10 | R10-BOID-ID Ops Offc Campus Server/Telcom Room | Boise, ID | Servers moved or Decommissioned | 2012 |
| 9 | EPA RTP CAMPUS | RTP-RTPNC-E455 Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 10 | EPA RTP CAMPUS | RTP-RTPNC-E477B Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 11 | EPA RTP CAMPUS | RTP-RTPNC-E460A Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 12 | EPA RTP CAMPUS | RTP-RTPNC-E460 Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 13 | EPA RTP CAMPUS | RTP-RTPNC-C240 Campus Server/Telcom Room | RTP, NC | Servers moved or Decommissioned | 2012 |
| 14 | EPA Region 05 | R05-WIIL-COOP Suite A Campus Server/Telcom Room | Willowbrook, IL | Servers moved or Decommissioned | 2013 |
| 15 | EPA Region 05 | R05-CHIL-GLNPO R1722 Campus Server/Telcom Room | Chicago, IL | Servers moved or Decommissioned | 2013 |
| 16 | EPA CINCI CAMPUS | CINCI-Norwood Campus Server/Telcom Room | Cincinnati, OH | Servers moved or Decommissioned | 2013 |
| 17 | EPA HQ | HQ-Ariel Rios-6033 Campus Server/Telcom Room | Washington, DC | Servers moved or Decommissioned | 2013 |
| 18 | EPA OECA NEIC | R08-LKCO-NEIC 1B-235 Campus Server/Telcom Room | Lakewood, CO | Servers moved or Decommissioned | 2013 |
| 19 | EPA HQ | HQ-EAST B149 Campus Server/Telcom Room | Washington, DC | Servers moved or Decommissioned | 2013 |
| 20 | EPA Region 08 | R08-GOCO-Lab A 118 Campus Server/Telcom Room | Golden, CO | Servers moved or Decommissioned | 2013 |
| 21 | EPA Region 10 | R10-LCWA-Lacey W 1C02 Campus Server/Telcom Room | Lacey, WA | Servers moved or Decommissioned | 2013 |
| 22 | EPA Region 08 | R08-HLMO-R8MO 359 Campus Server/Telcom Room | Helena, MT | Servers moved or Decommissioned | 2014 |
| 23 | EPA RTP CAMPUS | RTP-RTPNC-RTF 1125 Campus Server/Telcom Room | Durham, NC | Servers moved or Decommissioned | 2015 |
| 24 | EPA RTP CAMPUS | RTP-RTPNC-RTF 1109 Campus Server/Telcom Room | Durham, NC | Servers moved or Decommissioned | 2015 |
| 25 | EPA Region 09 | R09-SFCA-Hawthorne RM 403 S Campus Server/Telcom Room | San Francisco, CA | Servers moved or Decommissioned | 2015 |

5 Agency Governance Framework for Data Center Consolidation

EPA's existing IT governance framework ensures that its CRSSM initiatives have appropriate management commitment, performance and project management.

The CRSSM initiatives supporting data center consolidation initiatives are led by a cross-Agency team of IT operations managers from EPA's national program offices, regions

and research laboratories. The team leads the planning, implementation and project management for these initiatives and is chartered by and reports to the EPA's Quality Technology Subcommittee (QTS).

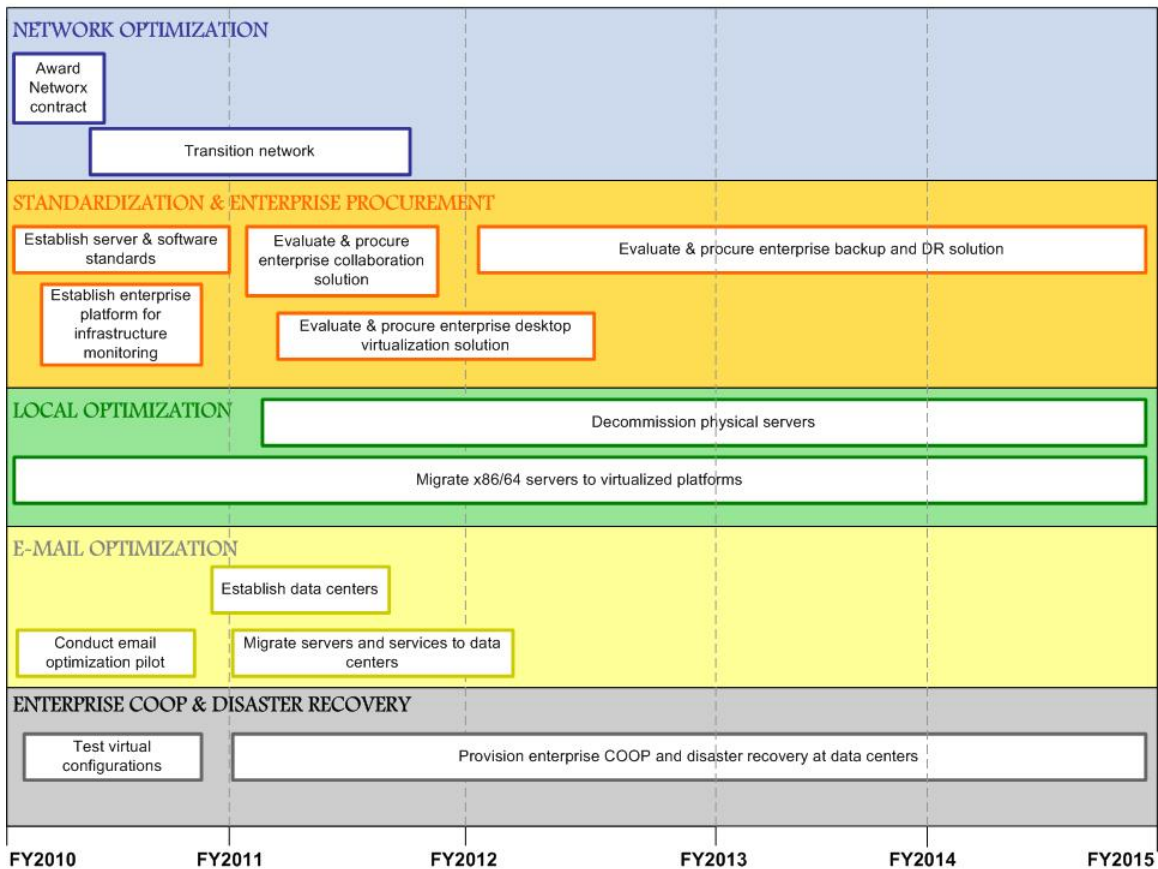
The QTS is a subcommittee of EPA's Quality and Information Council (QIC). The QIC provides assistance to the Assistant Administrator for Environmental Information and Chief Information Officer (CIO) in the development and implementation of the Agency's quality, information and technology goals and policies. The CIO is the Agency-level sponsor and champion for the project.

The QTS is led by EPA's Chief Technology Officer (CTO), includes senior IT officials from across EPA and is charged with addressing enterprise-wide issues regarding mission need, IT infrastructure solutions, long-term technology planning and systems integration. The QTS ensures senior management commitment to the initiatives and provides overall program management across Agency components.

The key performance measure for consolidation is the number of physical servers, virtual hosts and virtual operating systems managed within each data center or server room. The IT operations managers responsible for each data center or server room identify project managers, establish annual targets and report progress quarterly. Performance will be measured and reviewed by the CRSSM Team and reported to the QTS.

The following diagram lays out the timeline for EPA's Data Center Consolidation Plan.

DATA CENTER CONSOLIDATION PLAN TIMELINE



5.1 Cost-benefit Analysis

In 2008, EPA worked with Gartner, Inc. to conduct an analysis to benchmark the effectiveness and efficiency of EPA’s CRSSM services against two different peer sets: a decentralized peer set and a centralized peer set. The decentralized peer set was comprised of distributed organizations that operate their server and storage environments as EPA does today. The centralized peer set was comprised of organizations that have achieved standardization in procedures, service levels and policies. This analysis showed that the total cost of EPA’s CRSSM services was approximately \$0.5M less than the decentralized peers and \$4.5M more than the centralized organizations.

EPA’s goal is to become more like its centralized peers, while leveraging a hybrid approach due to the geographically distributed nature of the agency and the localized nature of EPA business services. EPA’s approach is designed to obtain the service delivery and performance benefits of virtualization and consolidation in a manner that leverages existing labor resources and capital resources.² This approach is based upon expert industry advice and a constrained IT budget. EPA’s cost benefit analysis showed that without implementation of the CRSSM Initiatives, EPA’s CRSSM costs would grow by \$2.2M annually. Savings are attributed to cost avoidance due to improved operations efficiency.

EPA anticipates the following:

- Reduced capital costs for physical server hardware will be largely offset by increased license costs to support secure operation of virtualization platforms.
- No building operational cost reductions due to room decommissioning. All EPA data centers and server rooms are housed within mixed use facilities and cannot be discarded, and most will continue to provide local telecommunications and building access support services.
- Actual cost savings due to reduced energy consumption are minimized by the large concentration of servers in RTP, NC.
- Labor costs will remain constant as long as EPA effectively manages standardization and project execution.

5.2 Risk Management and Mitigation

In developing the CRSSM Initiatives, EPA consulted a range of IT consolidation practitioners and experts from government and industry to identify proven practices, pitfalls and lessons learned. In addition, the CRSSM Team is currently reviewing the lessons learned identified in the General Accounting Office (GAO) report on data center consolidation (GAO-11-565).

The table below lists the data center consolidation practitioners and technology experts the CRSSM Team consulted.

EPA Data Center Consolidation Plan

| Practitioners & Technology Experts | Topic |
|---|---|
| Centers for Disease Control | Lessons learned CDC consolidation |
| Coast Guard | Lessons learned Coast Guard consolidation |
| Department of Labor, Mine Safety & Health | Files service consolidation effort |
| Marine Corps | Lessons learned from IT consolidation |
| Nelson Consulting | Cost modeling |
| State of Oregon | Data center consolidation |
| Dell | Data center consolidation, virtualization, green technology |
| Oracle | Oracle's consolidation effort and best practices |
| Burton Group | IT solutions and implementation best practices |
| Cisco | Data center consolidation, virtualization and |
| Citrix | Virtualization |
| Computer Associates | ITIL |
| DataSynapse | Application standardization and virtualization |
| EMC | Data center efficiency strategies |
| Gartner Consulting | Baseline/Benchmark Analysis |
| IBM | Lotus Notes consolidation |
| Microsoft | Data center consolidation, virtualization, green solutions |
| Qwest | Data Center Operations |
| Rackspace | Data center efficiency & service models |
| Third Sky | ITIL |
| VMware | Server virtualization |

The information gathered from these consultations identified key risks and lessons learned and informed EPA's overall approach to data center consolidation. EPA's risk mitigation planning evaluated the sequencing and timing of the CRSSM initiatives based on a range of risk factors and dependencies. Initiatives with the lowest impact and network dependency are pursued first to facilitate the change and demonstrate early successes. The table below depicts the results of this assessment.

| Initiative | Manageability/ Difficulty of Transition | Impact to Customer | Technical Complexity | Impact to Organizations & Service Delivery | Infrastructure Investment | WAN Dependent |
|--|---|-----------------------|-------------------------|---|------------------------------|------------------|
| Standardization & Enterprise Procurement | Low | Low | Low | Low | Low | Low |
| Local Optimization | Low | Low | Low | Medium | Low | Low |
| Email | Low | High | Low | Low | Medium | High |
| File (COOP/DR) | Medium | High | Medium | Low | Medium | High |
| Hosting (COOP/DR) | High | High | High | High | High | High |

The IT operations managers responsible for each data center or server room identify project managers, establish annual targets and report progress quarterly. Performance will be measured and reviewed by the CRSSM Team and reported to the QTS. During the quarterly review process IT operations managers will identify any new risks and required mitigation actions.

5.3 Acquisition Management

EPA conducted an analysis of all Agency-owned software and identified software licenses that demonstrate high potential for cost avoidance and/or reduction. To determine the software licenses that have a high potential for cost reduction, EPA considered the following factors—financial significance within CRSSM services scope, degree of use by organizations and opportunity to optimize purchasing methodology. Based on the analysis, EPA identified the following initial targets for enterprise license procurement.

Enterprise Applications (non-desktop): EPA maintains various software products supporting antivirus, collaboration, patch management, directory services and various commercial application platforms. EPA has established standards and enterprise procurement for e-mail, virus protection, vulnerability management, directory services, patch management and geographic information systems (GIS) application platforms and data services. In the near term EPA will evaluate and procure enterprise solutions for backup and disaster recovery, desktop virtualization and collaboration. These efforts will consolidate or eliminate redundant software products to drive enterprise efficiencies with procurement, deployment and application administration.

Server and Storage Platforms and Supporting Management Tool Sets: Over 90 percent of EPA servers are currently purchased through Agency blanket purchase agreements (BPA). While these BPAs have led to a high degree of standardization in server and storage platforms, further efficiencies may be gained. In 2010 EPA established server and software standards for x86/64 virtualization platforms and established an enterprise platform for infrastructure monitoring. Future efforts will focus on establishing volume-based procurements that drive increased standardization and improve discounts.

In addition to Agency-wide acquisition vehicles, EPA will leverage government-wide acquisition vehicles, including GSA Networx, GSA SmartBuy, GSA Schedule 70 and NASA's SEWP.

5.4 Communications Strategy

EPA has developed a communications plan for its data center consolidation initiative. The communications plan outlines an approach for communicating and working with key stakeholder groups (e.g., EPA management, unions, employees and vendors) to ensure understanding, buy-in and support for the project. The plan provides the context, framework and guidance for the implementation of all communications and outreach activities among the implementation team's stakeholders and customers. It lays out the key and core messages, an analysis of the team's key audiences, communication approaches and vehicles, and an implementation plan and timeline to ensure all communications are timely and strategic. The plan is considered a living document that is

updated on a periodic basis to ensure communications effectively address audiences' needs and support the successful implementation of the data center consolidation initiative.

The foundation of EPA's CRSSM communications strategy has been continual communications, both top-down and bottom-up, throughout the process. The CRSSM Team, with representation from across EPA field offices and programs, meets bi-monthly for project meetings to develop strategic plans and has bi-weekly conference calls to track specific project status and progress. The CRSSM Team briefs and consults EPA's QTS quarterly. Staff-level training and coordination meetings are held regularly to inform and train staff regarding planned technology changes and to gather feedback. Planned changes that may impact the work environment are briefed and coordinated with EPA's employee unions. Last, CRSSM initiative plans and training documents are published on an easily accessible internal website. Diverse and persistent communications are fundamental to the success of the initiative.

6 Progress

6.1 FDCCI Consolidation Progress

EPA continues to progress in plan execution with some minor delays due to technology and resource constraints.

- A. **Network Optimization:** EPA completed the initial network transition in March 2010 and continues to expand the use of cloud services provided under the GSA Network contract. In 2012 EPA will migrate its e-mail gateways and remote access services to this commercial cloud service.
- B. **Standardization and Enterprise Procurement:** In 2010, EPA established server and software standards for x86/64 virtualization platforms and established an enterprise platform for infrastructure monitoring. In 2011, EPA completed enterprise procurements for the following technologies: Server Hosted Virtual Desktop, Enterprise Web Conferencing (cloud), Enterprise Service, Enterprise Identity and Access Management, Enterprise Remote Access, Enterprise Electronic Records Discovery and Enterprise VOIP services.
- C. **Local Optimization:** EPA has achieved substantial gains in virtualization. Nine percent of physical servers are virtual machine hosts and 32 percent of EPA servers are virtual machines. EPA added over 360 virtual machines in 2011, increasing the total virtual machine count to over 900. Servers will be eliminated from two server rooms in 2012. EPA established racking and network infrastructure to accommodate RTP campus consolidation efforts, which is scheduled for 2012.
- D. **E-mail Optimization:** EPA established the required private cloud infrastructure in the four primary data centers and has begun the migration and transition of users to the consolidated infrastructure. This project is expected to be complete in 2012 if resources remain constant across the fiscal year transition.

- E. Enterprise COOP and DR:** EPA migrated two EPA offices' COOP/DR hosting services to one of the four primary data centers. EPA completed the initial requirements definition and design alternatives for an additional EPA organization.

6.2 Cost Savings

EPA completion of the network optimization initiative reduced EPA's monthly WAN costs by over 50 percent from \$179 to \$83 per megabit. These cost savings enabled a doubling of EPA WAN capacity to support server consolidation efforts within EPA's existing operating budget. WAN capacity is a critical path dependency for consolidation.

EPA re-competed labor contracts responsible for approximately 44 percent of server operations. The new contracting model provides for increased competition through a multi-award contract with annually renewable tasks. These reduced labor costs enable EPA to accommodate approximately \$1.5M in annual server consolidation costs within EPA's existing operating budgets.

¹ For the purpose of the Federal Data Center Consolidation Initiative (DCCI) any room that is devoted to data processing servers (i.e., server closets (typically < 200 sq. ft.) and server rooms (typically < 500 sq.ft.) within a conventional building) is considered a data center, just like larger floor spaces or entire buildings dedicated to housing servers, storage devices and network equipment. This definition excludes any facilities that are exclusively devoted to communications and network equipment (e.g., telephone exchanges, telecom rooms/closets). This definition of data center, emphasizing the presence of any data processing servers, reflects the main focus of DCCI, which is the optimization of server, rack space and floor space utilization in terms of data processing. (See Report to Congress on Server and Data Center Energy Efficiency, Public Law 109-431, U.S. Environmental Protection Agency ENERGY STAR Program, August 2, 2007)

² Gartner Research Q&A: Six Misconceptions About Server Virtualization, 29 July 2010, ID:G00201551