



Small Business Administration

**SBA Information Technology Infrastructure
Segment Architecture**

Strategic Roadmap

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Revision Sheet

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IT Infrastructure Segment Architecture - Roadmap

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1 Executive Summary

The Small Business Administration (SBA) is creating an IT Infrastructure Segment Architecture as part of its long term planning process. The IT Infrastructure is managed by the Office of the Chief Information Officer (OCIO) and includes the following components:

- End User Systems and Support (EUSS);
- Mainframe and Server Services and Support (MSSS);
- Telecommunications Services and Support (TSS); and
- Enterprise Application Support Services (EASS) – as it relates to Service Oriented Architecture (SOA).

The segment architecture development for IT Infrastructure has followed a defined process, aligned with the Federal Segment Architecture Methodology (FSAM). First, the current state was analyzed across all levels of the architecture (performance, business, service, technology), with an emphasis on identifying performance gaps and compliance with federal mandates. Then, the IT Infrastructure target state architecture was defined, based on performance improvement opportunities identified in the current state, reuse and collaboration opportunities, and the principles of the SBA enterprise architecture and the IT Infrastructure Optimization Line of Business (ITILOB).

The target state for the SBA Infrastructure envisions an efficient and effective infrastructure that fully supports the Agency's business operations. It will drive down costs and promote reuse and collaboration internally and with external partners. The target state includes a modernized network with proactive bandwidth management, a "next generation" data center with full security, environmental and capacity requirements, complete remote disaster recovery (DR) capabilities, formal and standardized infrastructure management processes, a focus on reuse and collaboration through SOA, and full compliance with federal cross-agency IT initiatives.

The IT Infrastructure Roadmap describes the IT Infrastructure transition strategy to achieve the target state architecture. It identifies the recommended initiatives needed to fulfill the segment vision and the order in which they should be executed. The high-priority business improvement opportunities were grouped into logical initiatives, in alignment with the Agency's Consolidated Five Year Optimization Plan (the "Five-Year Optimization Plan"), each of which may list one or more projects.

The following initiatives have been identified as crucial to the IT Infrastructure's modernization efforts:

- Initiative 1 – Network Analysis and Modernization
- Initiative 2 – Archive and Retrieval System for Email
- Initiative 3 – Federal Desktop Core Configuration (FDCC)
- Initiative 4 – Expanded Processes
- Initiative 5 – Trusted Internet Connection (TIC)
- Initiative 6 – Remote DR Infrastructure
- Initiative 7 – Homeland Security Presidential Directive 12 (HSPD- 12) Infrastructure
- Initiative 8 – Internet Protocol version 6 (IPv6) Transition
- Initiative 9 – Service Oriented Architecture (SOA) Preparation and Planning
- Initiative 10 – Green IT



This document also includes a sequencing plan and business justification for these initiatives.

2 Scope of the Document

This document proposes nine initiatives and a high-level sequencing plan to fill the performance gaps exposed during the current and target state segment architecture analysis. This strategic roadmap for the SBA Infrastructure moves the current (as-is) architecture to the target (to-be) architecture by identifying improvements at the performance, business, service component, and technical architecture layers. The current state and target state architectures are described in separate documents.

3 Current State and Target State Gap Analysis

The enterprise architecture analysis that led to the target state architecture described business capabilities needed by the IT Infrastructure, the performance metrics to track the accomplishment of those capabilities, the services required to manage operations and automate business processes. The target state outlined the technologies that will optimize the SBA's IT the infrastructure, enabling it to continue to support the Agency's high-performance business applications, data, and communications.

SBA will address the gaps between the IT Infrastructure target state architecture and the current state architecture with the architectural recommendations described below. The initiatives described later in this document form the transition plan.

3.1 Performance Gaps

The mission, vision, and goals of the OCIO, responsible for the IT Infrastructure, are unchanged in the target state. The performance architecture has two main gaps:

- Identification and collection of performance metrics themselves
- Ability of the infrastructure to meet the targets for certain performance metrics.

The metrics that measure inputs, outputs, and outcomes and the process for collecting and monitoring them must be more clearly defined. Data to support the metrics is not easily available, nor are metrics definitions clearly defined. Additionally, existing metrics are not gathered for all areas of infrastructure operations. As OCIO adopts standard IT Infrastructure Library (ITIL) processes (see Section 4.4 and Section 4.2.1 in the Target State), it must adopt associated performance metrics in order for the performance metrics to be complete, as described in Section 4.1.4 of the Target State.

Based on examination of the SBA Consolidated Five Year Optimization Plan (for the ITILOB), the Gartner Data Analysis Reports for the ITILOB, the SBA submission in the Gartner ITILOB Data Collection Forms, and the Exhibit 300 for Office Automation, Telecommunications, and Infrastructure (OAT/I), the current state infrastructure does not deliver the level of performance desired in certain areas. In the following areas, SBA failed to achieve the target/benchmark level of performance. The initiatives outlined later in this document seek to close these gaps:

- **EUSS**
 - Cost per Help Desk handle contact
 - Help Desk speed of answer
 - First call resolution
- **MSSS**
 - UNIX cost per server
- **TSS**
 - WAN cost per device
 - LAN cost per port
 - Internet access cost
 - Long distance cost
 - Cellular cost
 - Local phone cost

In general, SBA's costs for desktops, laptops, mobile devices and peripherals are similar to other small organizations. Costs related to the Help Desk were not aligned with those from smaller organizations, although the data that supported the metric, and the means to gather the data, may not reflect actual operations and is being reevaluated.

3.2 Functional Gaps (Business and Services)

The business functions of the IT Infrastructure segment do not change in the target state and there is no gap at the Business Reference Model (BRM) line of business or sub-function level. However, based on analysis of industry infrastructure best practices based on the Information Technology Infrastructure Library (ITIL), at the process level, there are a number of operational processes that will be added or improved to align with ITIL standards. Standard ITIL processes and process names must be adopted throughout OCIO and existing work must be categorized according to these industry-standard terms.

Processes to be added include the list below. These processes focus on service management to enable SOA and on performance/metric management:

- Service Catalog Management
- Service Lifecycle/Portfolio Management
- Metric Management
- SOA Governance

Several other processes will be standardized and formalized per ITIL, where training is already underway. The target state service component architecture includes 13 new service components across six service types.

The OCIO is planning the development of a mature SOA to support an EASS sub-segment. A robust SOA program will provide reuse opportunities and cost savings for the mission-oriented lines of business (LOBs). Four of the new service components enable the transition to an SOA-based delivery approach.

SBA currently does not have an infrastructure or platform in place to support an SOA-based delivery approach. There are no application and data integration components in production that currently promote reuse and sharing. Initiatives in this roadmap will close that gap.

There is no service catalog and there is minimal reuse as well as a lack of formal documentation of reuse instances, all of which the target state addresses.

3.3 Technical Gaps

At the technical level, there are several gaps between the current state and target state. The target state was architected to address improvement opportunities presented by ITILOB guidance, other government-wide infrastructure initiatives, and to address findings of OIG reports. Also, as the ITILOB matures, SBA will endeavor to adopt the guidance or use federal shared service solutions as they are developed:

- **Network** –The network generally does not have performance issues, although costs are higher than small agency benchmarks that SBA plans to meet in the target state. The GAO Report GAO-08-759 finds that SBA is properly preparing for the transition to the Network contract for telecommunications services, which should drive down telecom costs.

- **Data Center** – While the current headquarters data center meets most of SBA’s current needs, there is a need for a robust, “next generation” data center as described in the target state that meets full capacity, security, and environmental requirements.
- **Disaster Recovery** – Necessary redundancy is missing for some key applications and the SBA Security Framework notes that per NIST SP-53, proper contingency planning policies must exist, but that SBA needs to establish processes to recover the data center from a disruption or failure. The target state describes a comprehensive, remote disaster recovery infrastructure that provides the needed redundancy and complies with NIST guidance.
- **TIC** – SBA must reduce its Internet connections per TIC guidance.
- **IPv6** – SBA has met all the milestones and deadlines required by the IPv6 federal initiative. While SBA has installed hardware and successfully conducted limited testing, IPv6 is not yet fully enabled, as envisioned in the target state.
- **HSPD-12** – SBA does not currently use the PIV cards for logical access to systems for SBA employees and contractors, but will do so in the target state. The SBA Office of the Inspector General Report 09-01 from September 2008 found that SBA has not been certified or accredited as an organization capable of developing and operating an HSPD-12 compliant card issuance system; did not ensure that the development contractors were GSA-approved; and did not perform a security review of the identity management system (IDMS) to ensure that the privacy data it maintains is adequately protected. SBA has already begun addressing these weaknesses, and the HSPD-12 program at SBA, and as described in this Roadmap, will close these gaps.
- **FDCC** – SBA currently meets about 80% of the FDCC elements and will strive for near 100%.

4 Business Change Initiatives

The initiatives described below implement the recommendations made in the target state that will improve the performance of SBA's IT infrastructure. A mapping of these initiatives to those in the Five Year Optimization Plan is in Appendix B: Strategic Alignment. The segment architecture initiatives are intended to align with those required by the ITILOB.

4.1 Initiative #1: Network Analysis and Modernization

4.1.1 Description

The network infrastructure serves as a foundation of the infrastructure and supports other major planned initiatives, such as HSPD-12, IPv6, and remote DR infrastructure. This initiative is comprised of three projects:

1. Network Analysis

The network analysis will provide SBA with the basis for:

- Understanding shortages and surpluses in bandwidth capacity,
- Developing a grid technology, and;
- Moving toward an integrated IP-based voice, data, and video network.

The outcome of the initiative will help SBA to balance its network loads, identify the opportunities for potential upgrades, and update its network topology design.

This will become an on-going process once the baseline of the current network capacity, topology, and technology is established. The demand forecasting process will provide a feedback mechanism to the network analysis and modernization initiative to address the needs.

2. Transition to Networkx

Networkx is a new government wide contract administered by the General Services Administration (GSA) that replaces FTS2001 for telecom services. All federal agencies will transition to Networkx by 2010. This project focuses on the procurement of telecom service contracts in order to realize cost savings for the Agency. Replacing the telecom service providers will not cause major impacts to the existing network infrastructure, including its topology, operations, or security measures.

3. Transition to the Next Generation Data Center

The current state headquarters (HQ) data center hosts network operations, business applications, and IT systems for OCIO's customers. It has limited capacity and will need improvements to meet more stringent standards. A specialized vendor or federal shared service will provide hosting services for SBA's next generation data center, for both the internal and external IT systems. A next generation data center will also enable full security and green IT initiatives, reducing SBA's carbon footprint. The HQ facility and the Denver Network Operations Center (DNOC) will only provide network functionality after the transition.

Due to its higher level of service requirements and availability demands, the Office of Disaster Assistance's (ODA's) Disaster Credit Management System (DCMS) is hosted by a specialized vendor, SAVVIS, at a facility in Herndon, Virginia, and SBA's Loan Management Accounting System (LMAS) will also be hosted by SAVVIS at the same facility. The next generation data center could potentially be outsourced to the same facility (dependent on a full competitive, procurement process). With the implementation of LMAS, the Joint Administrative Accounting Management System (JAAMS) will be migrated to the same SAVVIS facility and integrated with LMAS. The Corio data center that hosts JAAMS will be retired after the migration. The Unisys

data center in Eagan, Minnesota that hosts the legacy mainframe systems will be replaced by LMAS and retired. ODA's email and messaging functionality will be consolidated with the OCIO's where ODA's Exchange and Trio servers will be transitioned into the next generation data center.

4.1.2 Benefits

- Improved network availability.
- Optimized network performance.
- Improved IT system availability.
- Improved hosting capacity.
- Cost optimization by balancing the shortages and surpluses in network infrastructure.
- Cost savings from integrated IP-based voice, data, and video network.
- Cost savings from leverage a government wide contract (Networx).
- Cost avoidance from improved availability and reliability of IT systems.

4.1.3 Dependencies and Assumptions

4.1.3.1 Dependencies

- The Network Analysis project has no dependency on any other project, although work has started on this effort in 2008.
- The Transition to Networx project has no dependencies on any other project but should be coordinated with the Network Analysis to included uncovered requirements in any procurement process.
- The Transition to the Next Generation Data Center project has no dependencies on any other project, but will probably be scheduled after 2011, due to the budgeting cycle.

4.1.3.2 Assumptions

- A demand forecasting process is established.
- The HQ data center will continue to have the capacity limitation, making it unsuitable to serve as the next generation data center.
- Current SBA facilities, such as DNOC, do not have the capacity to serve as the next generation data center.
- The transition to Networx will not have impacts to the existing network infrastructure, including its topology, operations, or security measures.

4.1.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics outlined in Table 1.

TABLE 1: PERFORMANCE METRICS IMPACTED BY NETWORK ANALYSIS AND MODERNIZATION

#	Performance Metric
PAR-1	IT Systems Availability
SP-MSSS-1	Wintel cost per server
SP-MSSS-2	Wintel server availability
SP-MSSS-3	UNIX cost per server
SP-MSSS-4	UNIX server availability percentage
SP-MSSS-5	Linux cost per server
SP-MSSS-6	Linux server availability percentage
SP-TSS-1	Wide area data network cost per device
SP-TSS-2	Wide area data network availability
SP-TSS-5	Local area network cost per active port
SP-TSS-6	Local area network availability percentage
SP-TSS-7	Internet access cost per gigabyte
SP-TSS-8	Internet access network availability percentage
SP-TSS-9	Long distance telephony cost per minute
SP-TSS-10	Long distance telephony availability percentage
SP-TSS-11	Cellular calling cost per minute
SP-TSS-12	Local telephony cost per extension
SP-TSS-13	Local telephony availability percentage
SP-TSS-14	Video conference cost per minute
MB-04-04-05-08.1	Timeliness of Backups
MB-04-04-05-08.4	Load test for concurrent system users
MB-04-04-05-11.6	Carbon footprint
MB-04-04-04-08.1	Percent of HQ SBA employees served by Telecom
MB-04-04-04-	Percent of network infrastructure up to date

#	Performance Metric
08.2	

4.2 Initiative #2: Archival/Retrieval System for Email

4.2.1 Description

This initiative will implement an enterprise-wide email archiving solution for SBA headquarters and field offices, which will provide the structure to operationalize National Archives and Records Administration (NARA) retention rules and guidelines as well as reduce local storage requirements. In addition, this initiative will provide for more efficient operation of the SBA email and messaging infrastructure.

4.2.2 Benefits

- More efficient email and messaging operations.
- Reduce local storage requirements.
- Cost savings and avoidance from more efficient operations and reduced storage requirements.

4.2.3 Dependencies and Assumptions

4.2.3.1 Dependencies

- There are no known dependencies at this time.

4.2.3.2 Assumptions

- This initiative does not include ODA email and messaging operations prior to consolidation with OCIO messaging operations.
- Primary email operations will be at SBA headquarters with a backup in Denver where a storage area network (SAN) at headquarters and another in Denver are utilized.
- A daily snapshot will be taken from headquarters and replicated across SANs to Denver.

4.2.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics in Table 2.

TABLE 2: PERFORMANCE METRICS IMPACTED BY ARCHIVAL AND RETRIEVAL SYSTEM FOR EMAIL

#	Performance Metric
SP-EUSS-12	Total cost per user

4.3 Initiative #3: Federal Desktop Core Configuration (FDCC)

4.3.1 Description

In order for SBA to implement a standards-based configuration management for desktops/laptops and allow for improved compliance with FDCC, this initiative will put forth a common operating environment to standardize the configuration and processes to provision these IT resources and to provide the foundation to help enable a standardized security configuration that meets FDCC requirements. Furthermore, this initiative will also provide mobile staff with secure, browser-based virtual private network (VPN) access to internal SBA resources.

The recent implementation of the CA Unicenter Asset Portfolio Manager will serve as the configuration management repository for IT assets. To further improve and formalize service support operations and processes, such as configuration management, EUSS staff is undergoing training for ITIL processes. With the use of CA Unicenter and expanded configuration management processes, SBA will have better management of standardized desktop/laptop configuration and security settings.

4.3.2 Benefits

- More efficient and standardized configuration management processes.
- Improved service support levels.
- Improved information security.
- Cost savings in maintaining and provisioning of desktops and laptops.

4.3.3 Dependencies and Assumptions

4.3.3.1 Dependencies

- The improvement and standardization of configuration management processes may be dependent on Initiative #4 - Expanded Processes.
- From a network perspective, there may be dependencies with Initiative #1 - Network Analysis and Modernization for desktop/laptop connectivity and VPN access.
- There may be potential dependencies with Initiative #7 – HSPD-12 with the implementation of the logical access infrastructure for access control in regards to the part of standardization of security configurations.

4.3.3.2 Assumptions

- Current desktop/laptop images are compliant with close to 80% of the FDCC security settings.
- CA Unicenter can provide the repository capabilities and functionality to support the overall configuration management processes.

4.3.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics in Table 3.

TABLE 3: PERFORMANCE METRICS IMPACTED BY FDCC

#	Performance Metric
SP-EUSS-1	Cost per user
SP-EUSS-2	Cost per primary device
SP-EUSS-8	Cost per Help Desk handle contact
SP-EUSS-10	Help Desk first contact resolution percentage
SP-EUSS-11	Help Desk speed of answer percentage
SP-EUSS-12	Total cost per user

4.4 Initiative #4: Expanded Processes

4.4.1 Description

The OCIO is increasing its emphasis on formalized processes, based on recent ITILOB analysis and an increasing interest in using ITIL processes. Many of the service functions described in the ITIL processes are already being provided, although the day-to-day work has not been linked to a formal process. The OCIO's processes divide into service, delivery and technology management, as referenced in the Operational Business Architecture section of the target state segment architecture document.

Expanding current processes into a more formal framework will require several steps. First, ITIL training will be necessary for OCIO staff to understand how their work can be categorized under the processes. Currently, staff has started training, with the full complement of staff slated to be ITIL certified by the end of FY 2010. Additionally, tools will be deployed to automate the use of the processes. One example is the roll-out of CA Unicenter modules, which began in the last quarter of FY 2008. CA Unicenter will allow the Help Desk to monitor processes, performance, and outcome as well as identify bottlenecks or areas for improvement. This will bring about the enterprise change management outlined in initiative five in the Five Year Plan. Other process improvements may include service catalog management, review of standard operating procedures, or resource forecasting.

Increased scrutiny on processes will also yield an important benefit: increased ability to measure outcomes using metrics. Each process improvement or roll out will give the OCIO an opportunity to define success, develop metrics, and measure performance as well as develop a formal framework to select and measure meaningful outcomes.

4.4.2 Benefits

The formalization of processes will provide the OCIO with improved visibility into daily IT operations, which will generate substantial benefits including:

- Identification of reuse opportunities.
- Compliance with SBA and Federal policies.
- Foundation for strategic planning.
- Clear pathways to collaboration.

- Contributions to SOA efforts.
- Knowledge of gaps and overlaps in existing processes.
- Clear processes, goals, and outcomes for metric development.
- Formal processes can be measured and metrics can be developed to indicate improvements.
- Cost savings and avoidance from more efficient IT operational processes.

4.4.3 Dependencies and Assumptions

4.4.3.1 Dependencies

- This initiative depends on the OCIO gaining buy-in at every level for formalizing the work processes.

4.4.3.2 Assumptions

- Change management process formalization and implementation have already started.
- Business decisions drive process, so processes should be defined prior to technology decisions.
- The ITILOB set of metrics will be the basis for gathering metric data and the basis for the inclusion of additional metrics.

4.4.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics in Table 4.

TABLE 4: PERFORMANCE METRICS IMPACTED BY EXPANDED PROCESSES

#	Performance Metric
SP-EUSS-8	Cost per Help Desk handle contact
MB-04-04-05-11.8	Percentage of SLAs met
MB-04-04-05-11.9	Number of internal applications with customer service level agreements
MB-04-04-05-11.7	Percentage of standard (pre-approved/defined) changes
ISP-1	Percentage of reused services

4.5 Initiative #5: Trusted Internet Connection (TIC)

4.5.1 Description

The TIC initiative, outlined in a memo from OMB to agency leaders issued on November 2007, is intended to optimize agencies' individual network services into a common solution for the federal government. Specifically, the initiative calls for federal agencies to consolidate and reduce the number of internet points of presence across federal government to a target of 50.

SBA will implement the consolidation of telecommunications circuits and reduction of internet points of presence in conformance with the TIC mandate. According to the guidelines provided by OMB, the Agency will:

- Inventory and document all the gateway connections (complete).
- Assess architecture, policy, governance and enforcement plans as well as implementation results (complete).
- Define target inventory and architecture (complete).
- Implement required changes (in progress).

4.5.2 Benefits

- Improved network security.
- Optimized network delivery capabilities.
- Cost savings due to consolidated network circuits.
- Cost avoidance due to better network security and lower security threats.

4.5.3 Dependencies and Assumptions

4.5.3.1 Dependencies

- This initiative has no dependency on the other initiative but it will overlap and coordinate with Initiative #1 - Network Analysis and Modernization.

4.5.3.2 Assumptions

- Internet points of presence are clearly defined and used consistently in identifying the TIC connections.

4.5.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics in Table 5.

TABLE 5: PERFORMANCE METRICS IMPACTED BY TIC

#	Performance Metric
PAR-2	Unauthorized network or data breaches
SP-TSS-1	Wide area data network cost per device
SP-TSS-7	Internet access cost per gigabyte
SP-TSS-8	Internet access network availability percentage

4.6 Initiative #6: Remote Disaster Recovery (DR) Infrastructure

4.6.1 Concept Summary

4.6.1.1 Description

Except for the redundancy and hot backup arrangement for its messaging services, SBA does not have a remote DR infrastructure for other IT systems. Lack of a DR infrastructure is a great risk to SBA and its stakeholders, as it may leave the Agency without the capabilities to execute its mission in the event of a disaster or other service failure. The IT systems may not be available when a disaster event occurs and it is difficult to predict when the IT systems will be reconstituted after such an event.

This initiative is comprised of two projects:

1. Short-Term Remote DR Infrastructure

SBA will work with a vendor to provide “warm-standby” offsite backup for the top tier of SBA network services. The solution, although limited in scope, will provide DR protection for the major IT systems hosted at the HQ data center. This short-term solution will be phased out as the HQ data center transitions to the next generation data center.

2. Long-Term Remote DR Infrastructure

With the next generation data center established, SBA will work with the hosting vendor to design a long-term remote DR infrastructure and solution that could offer full offsite recovery capabilities for all of the SBA IT systems. This solution will be integrated with the SBA network and data center infrastructure.

4.6.2 Benefits

- Provide the capability to continue or recover IT infrastructure operations in a timely manner after a disaster.
- Provide the capability to define and establish recovery objectives for IT systems after a disaster.
- Ensure IT system availability in the event of disaster.
- Improve continuity of services to stakeholders in the event of disaster.
- Cost avoidance for disaster recovery activities.
- Cost avoidance for financial and productivity loss due to IT systems not being available.

4.6.3 Dependencies and Assumptions

4.6.3.1 Dependencies

- Short-term remote DR infrastructure has no dependency on any other initiative.
- Long-term remote DR infrastructure depends on the transition to the next generation data center project of initiative #1 - Network Analysis and Modernization.

4.6.3.2 Assumptions

- SBA has determined its short-term and long-term needs for the remote DR infrastructure.

- The long-term solution is integrated with the SBA network and data center infrastructure to provide timely and effective disaster recovery.

4.6.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics in Table 6.

TABLE 6: PERFORMANCE METRICS IMPACTED BY REMOTE DISASTER RECOVERY INFRASTRUCTURE

#	Performance Metric
PAR-1	IT Systems Availability
SP-EUSS-4	Restoration for mission critical, <=4 hrs
SP-EUSS-5	Restoration for high priority, <=8 hrs
SP-EUSS-6	Restoration for medium priority, <=next business day
SP-EUSS-7	Restoration for low priority, <=second business day
SP-MSSS-2	Wintel server availability
SP-MSSS-4	UNIX server availability percentage
SP-MSSS-6	Linux server availability percentage
MB-04-04-05-08.1	Timeliness of backups
MB-04-04-05-11.6	Carbon footprint

4.7 Initiative #7: Homeland Security Presidential Directive 12 (HSPD-12) Infrastructure

4.7.1 Description

SBA's HSPD-12 project, mandated by OMB, is part of a government-wide OMB mandate to develop a common identification standard for all federal employees, both staff and contractors. The OCIO developed a pilot program, which matured into a production environment, complete with approved certification and accreditation (C&A). The OCIO provides the infrastructure to support issuance of personal identification verification (PIV) cards, an identity badge with an embedded identity chip. The SBA network will be utilized for PIV management and issuance of PIV cards, particularly in the field offices.

The PIV cards will be used for logical access control and the HSPD-12 platform will be further leveraged to consolidate the use of security tokens or other IP security solutions. PIV cards could also be used for physical access control and a potential enterprise-wide identity vault. The PIV system could be leveraged to serve as the master data repository and standardize the process for identity management.

4.7.2 *Benefits*

- The maturation of the PIV network will allow SBA to manage the identities of staff and contractors and comply with OMB's HSPD-12 mandates.
- Use of PIV cards for physical and logical access will improve security and reduce the threat of breaches.

4.7.3 *Dependencies and Assumptions*

4.7.3.1 *Dependencies*

- The HSPD-12 initiative does not have any dependencies.

4.7.3.2 *Assumptions*

- Existing network capacity can accommodate traffic for PIV data.
- Initiative #1 - Network analysis and modernization will plan for HSPD-12 network bandwidth needs.
- PIV card allocation of IPv6 addressing has been reserved for strategic integration with IPv6 initiatives.

4.7.4 *Cross Reference with Performance Metrics*

This initiative targets the achievement of the following performance metrics in Table 7.

TABLE 7: PERFORMANCE METRICS IMPACTED BY HSPD-12

#	Performance Metric
PAR-2	Unauthorized network or data breaches
XSP-3	Percentage of SBA OCIO staff (employees and contractors) with PIV credentials

4.8 **Initiative #8: IPv6 Transition**

4.8.1 *Description*

The SBA, like all federal agencies, must comply with OMB's mandates to transition to IPv6. The OCIO has begun this effort, but the actual implementation of IPv6 will be a very long-term project, as connectivity will be constrained due to the willingness of customers and partners (including banks and lending institutions) to accommodate the transition.

Currently, the OCIO has replaced all routers and switches with IPv6-compliant hardware, although the next five years will focus on building out the hardware for IPv6, and creating an IT environment that utilizes both IPv4 and IPv6.

4.8.2 *Benefits*

- The use of IPv6 will improve SBA’s interaction with its customers as IPv6 will expand the Agency’s internet capabilities without compromising security or quality.
- Planning for the transition will yield more efficient implementation.

4.8.3 *Dependencies and Assumptions*

4.8.3.1 *Dependencies*

- The implementation of IPv6 depends on the widespread adoption of the protocol.
- The IPv6 transition does not depend on any other initiatives, although it may be affected by network improvements.

4.8.3.2 *Assumptions*

- All customers and partners will eventually transition to IPv6.

4.8.4 *Cross Reference with Performance Metrics*

This initiative targets the achievement of the following performance metrics in Table 8.

TABLE 8: PERFORMANCE METRICS IMPACTED BY IPV6

#	Performance Metric
MB-04-04-04-08.2	Percent of network infrastructure up to date

4.9 Initiative #9: Service Oriented Architecture (SOA) Preparation and Planning

4.9.1 *Description*

In order to promote better reuse of service components and achieve business flexibility, SBA could utilize an SOA-based delivery approach to technology solutions. Within SBA, applications and data are running on various platforms and siloed within each line of business and program. There are currently no application and data integration components in place that may promote reuse and sharing within a line of business or even across lines of business. ODA leverages components for integration and messaging, but currently may not be mature and integrate well for sharing of services and information. SBA has developed a limited set of web services that are used on an ad-hoc basis to integrate with external parties. Further analysis and decomposition of business services will have to be conducted to identify commonalities for reuse.

Proper planning and collaborative relationships between OCIO and the business segments will have to be achieved in order to deliver an SOA capability that is driven by business needs and requirements. Within the planning and strategy stages, the vision and direction of SOA will have to be determined. In addition, proper funding mechanisms for SOA-related projects as well as pilot projects will have to be identified.

Adherence to formal processes for SOA Governance and Service Lifecycle/Portfolio Management will be needed to support the planning and execution throughout the lifecycle of SBA’s SOA delivery capability. There will have to be stronger alignment between the OCIO and business segments as well as a new definition of roles, responsibilities, and processes for

service development. Common infrastructure services will have to be identified and decomposed by the OCIO first. Analysis and deployment of these infrastructure services will provide the technical foundation for an SOA delivery capability and lead to better delivery of business services.

After improved maturity and familiarity with an SOA approach, a foundational, infrastructure platform of SOA-related components can be architected and deployed for providing and consuming services. Further analysis, decomposition, and deployment of business services that support key business processes can then be implemented. As SBA's SOA matures, additional services will be identified for reuse or transitioned to an SOA delivery approach. Furthermore, the SOA infrastructure platform can be evolved to better support business segments and become more agile. With SBA's maturation within each stage of SOA, there will have to be cognizance that SOA is not an out of the box technology that can be deployed to solve problems, but that it is a business driven, architectural approach that involves people, processes, and technologies in order to achieve business flexibility and cost savings through the reuse of services.

4.9.2 Benefits

- Improved business flexibility.
- Better alignment and relationships between the business segments and OCIO.
- Modular and streamlined approach to delivering technology solutions.
- Cost savings and avoidance with the reuse of common services.

4.9.3 Dependencies and Assumptions

4.9.3.1 Dependencies

- Adherence to SOA Governance and Service Lifecycle/Portfolio Management processes will be dependent on the overall initiative of Expanded Processes.

4.9.3.2 Assumptions

- Web services are currently developed for integration with external partners.
- Use of webMethods components at ODA are currently in the infant stages.

4.9.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics in Table 9

TABLE 9: PERFORMANCE METRICS IMPACTED BY SOA PREPARATION AND PLANNING

#	Performance Metric
ISP-1	Percentage of reused services
ISP-2	Number of services documented in the service catalog/registry
ISP-3	Number of applications/systems gone through an SOA health check

4.10 Initiative #10: Green IT

4.10.1 Description

SBA's commitment to more energy-efficient and environmentally sound infrastructure operations will be realized with this initiative. ITILOB guidance suggests that agencies should reduce energy and water consumption, acquire renewable energy, encourage sustainable practices in buildings, and purchase environmentally-approved electronic equipment. SBA will adopt these practices in a targeted and intentional manner throughout the OCIO.

4.10.2 Benefits

- More energy efficient IT operations.
- Reduced electricity consumption.

4.10.3 Dependencies and Assumptions

4.10.3.1 Dependencies

- There are no known dependencies at this time.

4.10.3.2 Assumptions

- This initiative does not consider the budgetary implications of Green IT as financial consideration may outweigh environmental, particularly in the short term.
- Existing Green IT efforts will continue.

4.10.4 Cross Reference with Performance Metrics

This initiative targets the achievement of the following performance metrics in Table 10.

TABLE 10: PERFORMANCE METRICS IMPACTED BY GREEN IT

#	Performance Metric
MB-04-04-05-11.5	Power usage effectiveness (PUE)
MB-04-04-05-11.6	Carbon footprint

5 Sequencing Plan

A systematic approach was applied to sequencing the final list of initiatives into a realistic plan based on benefits, value, priorities, dependencies, execution constraints, and risk-adjusted pace of execution. The sequence is a strategic plan that will deliver business benefit over time and based upon:

- **Business imperatives**, such as declared business milestones, requirements of the ITILOB and other cross-agency initiatives, the Agency strategic plan etc.
- **In-flight and planned activities**, such as IPv6, the network analysis, and FDCC.
- **Dependencies** between projects, such as process and technical dependencies.

The sequenced initiatives in Figure 1 include overall timelines and intermediate milestones as a particular initiative is executed over time. This sequencing plan can be used by the program offices in budgeting and planning their activities for the next five years.

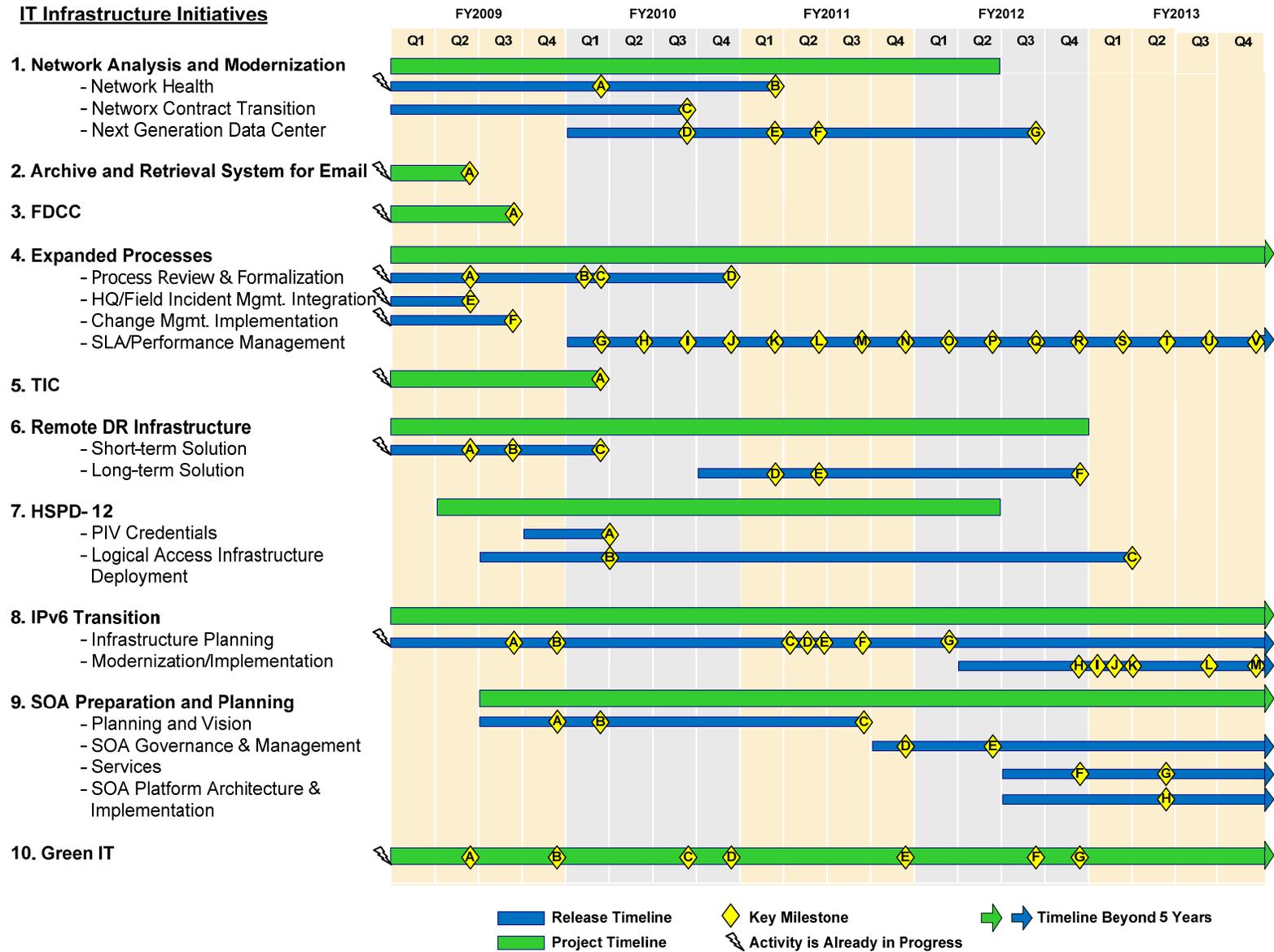
FIGURE 1: SEQUENCED INITIATIVES
IT Infrastructure Initiatives


Table 11 below outlines the milestone details of the sequencing plan as represented in the EA Segment Reporting (EASR) template for the IT Infrastructure segment architecture, which will be submitted quarterly to OMB. The milestones are current as of December 19th, 2008. For the latest milestone information, please refer to the actual IT Infrastructure EASR reporting template.

TABLE 11: SEQUENCING PLAN MILESTONES

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependencies on Milestone X	Dependencies/ Constraints
1-A	OATI / Network Analysis & Modernization / LAN/WAN	Network Health - Network health assessment and process formalization for on-going network health assessment & transition complete	Dec-09			
1-B	OATI / Network Analysis & Modernization / LAN/WAN	Network Health - Identified network health improvements/upgrades implemented	Dec-10		1-A	Network health assessment has to be conducted .
1-C	OATI / Network Analysis & Modernization / LAN/WAN	Network - Transition to Network complete	Jun-10			
1-D	OATI / Network Analysis & Modernization / LAN/WAN	Next Generation Data Center - Business case analysis complete	Jun-10			
1-E	OATI / Network Analysis & Modernization / LAN/WAN	Next Generation Data Center - Technical architecture complete	Dec-10		1-D	Business has to be analyzed and justified.
1-F	OATI / Network Analysis & Modernization / LAN/WAN	Next Generation Data Center - Transition planning complete	Mar-11		1-E	Technical architecture and design has to be completed .

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependent on Milestone X	Dependencies/ Constraints
1-G	OATI / Network Analysis & Modernization / LAN/WAN	Next Generation Data Center - Transition to next generation data center complete	Jun-12		1-F	Transition planning and details have to be completed .
2-A	OATI / Archive and Retrieval System for Email	System deployed	Mar-09			
3-A	OATI / Federal Desktop Core Configuration	100% compliant	Jun-09			
4-A	OATI / Expanded Processes	Process Review & Formalization - 50% of Directors/Managers ITIL certified	Mar-09			
4-B	OATI / Expanded Processes	Process Review & Formalization - 100% of Directors/Managers ITIL certified	Dec-09		4-A	Sequential progression of training.
4-C	OATI / Expanded Processes	Process Review & Formalization - 65% of ITIL processes adopted	Dec-09		4-B	Staff has to be trained and certified.
4-D	OATI / Expanded Processes	Process Review & Formalization - 100% of ITIL processes adopted	Sep-10		4-C	Initial ITIL processes have to be adopted.
4-E	OATI / Expanded Processes / CA Unicenter Service Desk	HQ/Field Office Incident Management Integration - Integrated	Mar-09			
4-F	OATI / Expanded Processes / CA Unicenter Service Desk	Change Management Implementation - Implemented	Jun-09			
4-G	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Dec-09			

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependent on Milestone X	Dependencies/ Constraints
4-H	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Mar-10		4-D	Processes for formal metric management have to be adopted.
4-I	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Jun-10		4-H	Scheduled monitoring and review of performance.
4-J	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Sep-10		4-I	Scheduled monitoring and review of performance.
4-K	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Dec-10		4-J	Scheduled monitoring and review of performance.
4-L	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Mar-11		4-K	Scheduled monitoring and review of performance.
4-M	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Jun-11		4-L	Scheduled monitoring and review of performance.
4-N	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Sep-11		4-M	Scheduled monitoring and review of performance.

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependent on Milestone X	Dependencies/ Constraints
						ce.
4-O	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Dec-11		4-N	Scheduled monitoring and review of performance.
4-P	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Mar-12		4-O	Scheduled monitoring and review of performance.
4-Q	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Jun-12		4-P	Scheduled monitoring and review of performance.
4-R	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Sep-12		4-Q	Scheduled monitoring and review of performance.
4-S	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Dec-12		4-R	Scheduled monitoring and review of performance.
4-T	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Mar-13		4-S	Scheduled monitoring and review of performance.
4-U	OATI / Expanded Processes	SLA/Performance Management - Quarterly review complete	Jun-13		4-T	Scheduled monitoring and review of

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependencies on Milestone X	Dependencies/ Constraints
						performance.
4-V	OATI / Expanded Processes	SLA/Performance Management - Compliance achieved	Sep-13		4-U	Scheduled monitoring and review of performance.
5-A	OATI / TIC	Compliant	Dec-09			
6-A	OATI / Remote DR Infrastructure	Short-term Solution - Business case analysis complete	Mar-09			
6-B	OATI / Remote DR Infrastructure	Short-term Solution - Technical architecture complete	Jun-09		6-A	Business case analysis and justification have to be complete.
6-C	OATI / Remote DR Infrastructure	Short-term Solution - Short-term solution implemented	Dec-09		6-B	Short-term Solution technical architecture has to be complete.
6-D	OATI / Remote DR Infrastructure	Long-term Solution - Business impact and case analysis complete	Dec-10		6-C	
6-E	OATI / Remote DR Infrastructure	Long-term Solution - Technical architecture complete	Mar-11		1-E, 6-D	Technical architecture for the next generation data center has to be complete. Business case analysis

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependant on Milestone X	Dependencies/ Constraints
						and justification has to be complete.
6-F	OATI / Remote DR Infrastructure	Long-term Solution - Long-term solution implemented	Sep-12		6-E, 1-G	Technical architecture and design for the long-term solution has to be complete. Transition to next generation data center has to be complete.
7-A	OATI / HSPD-12	PIV Credentials - Windows logon with PIV complete	Dec-09			
7-B	OATI / HSPD-12	Logical Access Infrastructure Deployment - 1st phase of integration with high impact systems complete	Dec-09			
7-C	OATI/HSPD-12	Logical Access Infrastructure Deployment - Complete	Dec-12		7-B	1 st phase of integration has to be complete
8-A	OATI / IPv6	Transition plan published	Jun-09			
8-B	OATI / IPv6	Business case	Sep-			

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependent on Milestone X	Dependencies/ Constraints
		submitted	09			
8-C	OATI / IPv6	IPv6 circuit modernization plan complete	Mar-11		8-A	Transition plan has to be complete.
8-D	OATI / IPv6	IPv6 infrastructure implementation plan complete	Mar-11		8-A	Transition plan has to be complete.
8-E	OATI / IPv6	IPv6 security device implementation plan complete	Mar-11		8-A	Transition plan has to be complete.
8-F	OATI / IPv6	Workstation and desktop application modernization planning complete	Jun-11		8-A	Transition plan has to be complete.
8-G	OATI / IPv6	Projects funded	Dec-11		8-B	Business case has to be submitted and progressed through the CPIC and budgeting process.
8-H	OATI / IPv6	Enterprise dual stack equipment implemented	Sep-12		8-D	Infrastructure plan has to be complete.
8-I	OATI / IPv6	IPv6 circuit modernization complete	Dec-12		8-C	Circuit modernization plan has to be complete
8-J	OATI / IPv6	IPv6 infrastructure implemented	Dec-12		8-I	Circuits have to be in place.

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependent on Milestone X	Dependencies/ Constraints
8-K	OATI / IPv6	IPv6 security devices implemented	Dec-12		8-J	Infrastructure has to be implemented.
8-L	OATI / IPv6	Server and desktop application modernization complete	Jun-13		8-K	Corresponding IPv6 infrastructure, security, and devices have to be implemented.
8-M	OATI / IPv6	ODA enterprise dual stack equipment implemented	Sep-13		8-K	HQ infrastructure has to be implemented.
9-A	SOA Preparation & Planning	Business case submitted	Sep-09			
9-B	SOA Preparation & Planning	Planning and vision complete	Dec-09		9-A	Business case has to be submitted.
9-C	SOA Preparation & Planning	Projects funded	Jun-11		9-A	Business case has to be approved and progressed through the CPIC and budget processes.
9-D	SOA Preparation & Planning	SOA governance, service lifecycle, and service catalog processes adopted and operational	Sep-11		4-D, 9-C	The SOA governance, service lifecycle, and

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependent on Milestone X	Dependencies/ Constraints
						service catalog processes have to be formalized. Projects have to be funded.
9-E	SOA Preparation & Planning	SOA development processes and roles adopted	Mar-12			Processes have to be in place.
9-F	SOA Preparation & Planning	Identification and decomposition of common infrastructure services along with standards completed and updated in the service catalog/portfolio	Sep-12		9-E	Sequential progression .
9-G	SOA Preparation & Planning	Analysis of business processes and services complete and updated in the service catalog/portfolio	Mar-13		9-F	Common infrastructure services can be shared first.
9-H	SOA Preparation & Planning	Technical and reference architecture for the foundational SOA platform completed	Mar-13		9-G	Business services have to be identified and decomposed.
10-A	OATI / Green IT	Green IT policies and procedures introduced	Mar-09			
10-B	OATI / Green IT	Enterprise power management software deployed	Sep-09		10-A	Sequential progression .

Milestone ID	IT Investment/ System/ Program/ etc...	Segment Milestone	Target Completion Date	Actual Completion Date	Dependencies on Milestone X	Dependencies/ Constraints
10-C	OATI / Green IT	Server support technicians telework started	Jun-10		10-A	Policies and procedures have to be put in place.
10-D	OATI / Green IT	25% of users are educated on IT computer greening efforts	Sep-10		10-A	Policies and procedures have to be put in place.
10-E	OATI / Green IT	60% of users are educated on IT computer greening efforts	Sep-11		10-D	Sequential progression.
10-F	OATI / Green IT	Number of physical servers is reduced	Sep-12			
10-G	OATI / Green IT	100% of users are educated on IT computer greening efforts	Sep-12		10-E	Sequential progression.

6 Business Justification

A large number of improvement opportunities were collected during the current state analysis. Stakeholders rated each opportunity on its business value and implementation difficulty. The implementation difficulty-to-business need matrix, based on the federal Value Measuring Methodology, provides a structured analysis of the initiatives based upon implementation difficulty, business need, and associated risk, which then helps determine and assess the prioritization of each initiative.

Opportunities were organized into the initiatives and the implementation difficulty and business need values were averaged from the grouped opportunities to reflect the values for each initiative represented in Table 12 below. For implementation difficulty, values range from 1-Easy to 10-Difficult and for business need, the values range from 1-Unimportant to 10-Important. Please see APPENDIX C: Opportunities Alignment for the mapping of each opportunity to an initiative.

The implementation difficulty and business need values for each initiative were also weighted with a risk analysis rating to provide a risk adjusted view. Risk probability and impact values (Low to High) were used for assessment in this adjusted view.

Opportunities that ranked lower in importance were not included in the roadmap analysis. The sequencing plan used business priority as a key input, together with current status of initiatives and requirements of federal mandates.

Table 12 provides information on the implementation difficulty-to-business need matrix.

TABLE 12: IMPLEMENTATION DIFFICULTY-TO-BUSINESS NEED MATRIX

Initiative		Base Scores		Aggregated Risk Analysis			Risk Adjusted Score	
				High	Med	Low		
				0.75	0.50	0.25		
				Risk Probability	Risk Impact			
Business Need	Implementation Difficulty	Implementation Difficulty	Business Need					
ID	Initiative	Implementation Difficulty	Business Need	Risk Probability	Business Need	Implementation Difficulty	Implementation Difficulty	Business Need
Init #1	Network Analysis and Modernization	6	7	Med	Med	Med	7.5	5.3
Init #2	Archival/Retrieval System for Email	5	7	Low	Low	Low	5.3	6.6
Init #3	FDCC	7	8	Low	Low	Med	7.9	7.5
Init #4	Expanded Processes	6	8	Med	Low	Med	7.5	7.0
Init #5	TIC	6	7	Low	Low	Med	6.8	6.6
Init #6	Remote DR Infrastructure	7	9	Med	Low	Med	8.8	7.9
Init #7	HSPD-12	7	7	Med	Med	Med	8.8	5.3
Init #8	IPv6 Transition	7	6	Med	Low	Med	8.8	5.3
Init #9	SOA Preparation and Planning	8	7	Med	Low	Med	10.0	6.1
Init #10	Green IT	5	7	Low	Low	Low	5.3	6.6

7 Risk Management

No business transition strategy or major IT implementation is without risk. The table below summarizes the risks evident at this point, together with strategies for mitigating those risks. As new risks appear, each must be tracked and resolved, as the OCIO moves through the infrastructure roadmap toward the target state.

TABLE 13: RISKS AND MITIGATIONS

Risks	Mitigation
Budget and Resources	
<ul style="list-style-type: none"> • Assigning value to infrastructure expenditures can be difficult, as they often lead to improved performance for other systems, but not directly to the OCIO. • Outsourcing may require additional contract-management skills that existing technical staff do not have. • SBA may not have the skill sets in-house required to execute on all these initiatives. • As infrastructure footprint shrinks, watts usage per square foot may increase. 	<ul style="list-style-type: none"> • Use reuse or improved customer service as a value measurement, rather than financial considerations alone. • Adopt an Agency-wide perspective on costing that assigns value to OCIO efforts. • Train appropriate staff to manage outsourced projects and contract agreements. • Provide additional training in conjunctions with using contractors with necessary expertise. • Calculate usage based on total building square footage, rather just OCIO usage.
Technology	
<ul style="list-style-type: none"> • SOA will require an additional layer of planning for updating or developing systems. • Changes to the network could cause unexpected capacity or availability issues. • ITILOB is still maturing, and new recommendations will come out over the period covered by this roadmap. • Any data center move is technically challenging, especially to maintain continuity of operations during the transition. 	<ul style="list-style-type: none"> • Develop a service catalog for developers to use. • Establish process and require participation for evaluating the affect of the network changes. • Evaluate each new recommendation. Adopt a bias towards federal shared solutions. • Detailed planning, which may include phased cutover.
Compliance/Policy/Governance	
<ul style="list-style-type: none"> • SBA staff may resist formal processes. • Compliance with OMB mandates may be compromised if milestones pass without action. • Requirements may change with the new administration. 	<ul style="list-style-type: none"> • Establish Office-wide value of participating in process requirements. • Include process participation in staff performance goals, particularly ITIL training.



8 Reuse Summary

The IT infrastructure segment is an enterprise service segment; therefore, it is primarily a provider, not a consumer, of services. As a result, there are a limited number of systems and services that the IT Infrastructure itself reuses. SBA's IT infrastructure will continue to mature along with the ITILOB, and as the ITILOB develops common infrastructure services in the Federal Transition Framework (FTF) catalog and implements federal shared service solutions, the SBA will take advantage of reusing those services. As SBA develops the detailed solution architecture for its next generation data center (see Section 4.1), it will examine any federal shared services available at that time and also the data center services currently used by the Disaster Credit Management System (DCMS)/Disaster Assistance segment and planned to be used by the LMAS/financial management segment.

8.1.1 Reused Data

Because of the nature of infrastructure, and in alignment with the guidance in the FTF ITILOB catalog, the reuse of data exchange packets and data entities is not applicable to this segment.

8.1.2 Reused Information Systems

The IT Infrastructure target state reuses or consolidates the following information systems:

TABLE 14: REUSED INFORMATION SYSTEMS

Information System	System Description	System Owner
Microsoft Exchange, Blackberry Server	Provides email and messaging capabilities across SBA	OCIO

8.1.3 Reused System Services

The IT Infrastructure target state reuses or consolidates the following system services:

TABLE 15: REUSED SYSTEM SERVICES

System Service Name	System Service Description	System Name	Provider Organization
Email	Support the transmission of memos and messages over a network	Microsoft Exchange Server, Blackberry Server	OCIO

8.1.4 Shared System Services Provided

SOA related components have been identified in the table below. Since the IT infrastructure segment is primarily a provider, these services have the potential to be reused by other segments.

TABLE 16: SHARED SYSTEM SERVICES PROVIDED

System Service Name	System Service Description
Legacy Integration	Support the communication between newer generation hardware/software applications and the previous, major generation of hardware/software applications
Enterprise Application Integration	Support the redesign of disparate information systems into one system that uses a common set of data structures and rules
Data Integration	Support the organization of data from separate data sources into a single source using middleware or application integration as well as the modification of system data models to capture new information within a single system
Software Development	Support the creation of both graphical and process application or system software

8.1.5 SmartBuy

SBA uses SmartBUY agreements for provisioning its virus management software, which is part of IT Infrastructure services.

9 Appendix A: Acronyms

The following is a list of acronyms used in this document

TABLE 17: LIST OF ACRONYMS

Acronyms	Expansion
BRM	Business Reference Model
DCMS	Disaster Credit Management System
DR	Disaster Recovery
EASS	Enterprise Application Support Services
EUSS	End User Systems and Support
FDCC	Federal Desktop Core Configuration
FEA	Federal Enterprise Architecture
FTF	Federal Transition Framework
HSPD-12	Homeland Security Presidential Directive 12
ITILOB	IT Infrastructure Optimization Line of Business
JAAMS	Joint Accounting Administrative Management System
LOB	Line of Business
IPv6	Internet Protocol Version 6
LTO	Long Term Objective
MSSS	Mainframe and Server Services and Support
OCIO	Office of the Chief Information Officer
ODA	Office of Disaster Assistance
OIG	Office of Inspector General
OMB	Office of Management and Budget
PES	Productivity Enhancement Staff
PMO	Program Management Office
SBA	Small Business Administration
SOA	Service Oriented Architecture

Acronyms	Expansion
SOC	Security Operations Center
TIC	Trusted Internet Connection
TRB	Technical Review Board
TRM	Technical Reference Model
TSS	Telecom Systems and Support
UDDI	Universal Description Discovery and Integration

10 Appendix B: Strategic Alignment

Strategic alignment of the roadmap and its initiatives with SBA goals and objectives from the SBA agency-wide IT Strategic Plan are critical the Agency's success. Table 18 below maps each initiative from the roadmap to the relevant SBA goal and objective as well as IT infrastructure performance metrics. Table 19 then maps the initiatives to any relevant cross-agency initiatives.

All IT Infrastructure initiatives map to strategic goal 4: "Ensure management and organizational excellence to increase responsiveness to customers, streamline processes, and improve compliance and controls."

TABLE 18: STRATEGIC ALIGNMENT OF INITIATIVES

Initiative	Agency Strategic Objective(s)	Performance Metrics
1 – Network Analysis and Modernization	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • PAR-1 - IT Systems Availability • SP-MSSS-1 - Wintel cost per server • SP-MSSS-2 - Wintel server availability • SP-MSSS-3 - UNIX cost per server • SP-MSSS-4 - UNIX server availability percentage • SP-MSSS-5 - Linux cost per server • SP-MSSS-6 - Linux server availability percentage • SP-TSS-1 - Wide area data network cost per device • SP-TSS-2 - Wide area data network availability • SP-TSS-3 - Metropolitan area network cost per gigabyte • SP-TSS-4 - Metropolitan area network availability • SP-TSS-5 - Local area network cost per active port • SP-TSS-6 - Local area network availability percentage • SP-TSS-7 - Internet access cost per gigabyte • SP-TSS-8 - Internet access network availability percentage

Initiative	Agency Strategic Objective(s)	Performance Metrics
		<ul style="list-style-type: none"> • SP-TSS-9 - Long distance telephony cost per minute • SP-TSS-10 - Long distance telephony availability percentage • SP-TSS-11 - Cellular calling cost per minute • SP-TSS-12 - Local telephony cost per extension • SP-TSS-13 - Local telephony availability percentage • SP-TSS-14 - Video conference cost per minute • MB-04-04-05-08.1 - Timeliness of Backups • MB-04-04-05-08.4 - Load test for concurrent system users • MB-04-04-05-11.6 - Carbon footprint • MB-04-04-04-08.1 - Percent of HQ SBA employees served by Telecom • MB-04-04-04-08.2 - Percent of network infrastructure up to date
2 – Archive and Retrieval of Email	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • SP-EUSS-12 - Total cost per user
3 – Federal Common Operating Environment (FDCC)	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • SP-EUSS-1 - Cost per user • SP-EUSS-2 - Cost per primary device • SP-EUSS-8 - Cost/Help Desk Handle contact • SP-EUSS-10 - Help Desk First Contact Resolution Percentage • SP-EUSS-11 - Help Desk speed of answer percentage • SP-EUSS-12 - Total cost per user

Initiative	Agency Strategic Objective(s)	Performance Metrics
4 – Expanded Processes	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations. 4.3 Provide financial and performance management services to support efficient and effective program delivery	<ul style="list-style-type: none"> • SP-EUSS-8 - Cost/Help Desk Handle contact • MB-04-04-05-11.8 - Percentage of SLAs met • MB-04-04-05-11.9 - Number of internal applications with customer service level agreements • MB-04-04-05-11.7 - Percentage of standard (pre-approved/defined) changes • ISP-1 - Percentage of reused services
5 – Trusted Internet Connection (TIC)	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • PAR-2 - Unauthorized Network or Data Breaches • SP-TSS-1 - Wide area data network cost per device • SP-TSS-7 - Internet access cost per gigabyte • SP-TSS-8 - Internet access network availability percentage
6 – Disaster Recovery (DR)	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • PAR-1 - IT Systems Availability • SP-EUSS-4 - Restoration for mission critical, <= 4 hrs • SP-EUSS-5 - Restoration for high priority, <= 8 hrs • SP-EUSS-6 - Restoration for medium priority, <= next business day • SP-EUSS-7 - Restoration for low priority, <= second business day • SP-MSSS-2 - Wintel server availability • SP-MSSS-4 - UNIX server availability percentage • SP-MSSS-6 - Linux server availability percentage • MB-04-04-05-08.1 - Timeliness of Backups

Initiative	Agency Strategic Objective(s)	Performance Metrics
		<ul style="list-style-type: none"> • MB-04-04-05-11.6 - Carbon footprint
7 – Homeland Security Presidential Directive 12 (HSPD-12)	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • PAR-2 - Unauthorized network or data breaches • XSP-3 - Percentage of SBA OCIO staff (employees and contractors) with PIV credentials
8 – Internet Protocol version 6 (IPv6) Transition	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • MB-04-04-04-08.2 - Percent of network infrastructure up to date
9 – Service Oriented Architecture (SOA) Preparation and Planning	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • ISP-1 - Percentage of reused services • ISP-2 - Number of services documented in the service catalog/registry • ISP-3 - Number of applications/systems gone through an SOA health check
10 - Green IT	4.2 Provide a safe and secure information system environment to support business decisions and Agency operations	<ul style="list-style-type: none"> • MB-04-04-05-11.5 – Power usage effectiveness (PUE) • MB-04-04-05-11.6 – Carbon footprint

Table 19 below maps initiatives from the roadmap to the relevant cross-agency initiatives.

TABLE 19: INITIATIVES MAPPED TO IT STRATEGIC PLAN AND CROSS-AGENCY INITIATIVES

Initiative	Cross-Agency Initiative
1 – Network Analysis and Modernization	ITILOB Networx
3 –Federal Desktop Core Configuration	ITILOB Federal Desktop Core Configuration
5 – Trusted Internet Connection	ITILOB Trusted Internet Connection
7 – HSPD- 12	HSPD-12
8 – IPv6 Transition	ITILOB IPv6

TABLE 20: SEGMENT ARCHITECTURE ROADMAP INITIATIVES MAPPED TO FIVE YEAR OPTIMIZATION PLAN INITIATIVES

Segment Architecture Roadmap Initiative	Five Year Optimization Plan Initiative
1 – Network Analysis and Modernization	Network Analysis and Modernization Networx
2 – Email Archive and Retrieval	Email Archive and Retrieval
3 –Federal Desktop Core Configuration	Common Operating Environment
4 – Expanded Processes	Enterprise Change Management Integrate Field and HQ Incident Management
5 – Trusted Internet Connection	Trusted Internet Connection
6 – Disaster Recovery	Remote Disaster Recovery
7 – HSPD- 12	HSPD-12
8 – IPv6 Transition	IPv6
9 – SOA Preparation and Planning	N/A

10 – Green IT

Environmental Initiatives and
Compliance

11 APPENDIX C: Opportunities Alignment

From the target state architecture, opportunities for improvement were identified along with an average score of business need and implementation difficulty based on stakeholder response. Each opportunity was mapped to a roadmap initiative to ensure traceability to the target state architecture. The analysis conducted in Section 6 is based on values outlined in Table 21 below.

TABLE 21: OPPORTUNITIES TO INITIATIVES MAPPING

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
1	Remote DR Infrastructure	Customer Satisfaction	The ability to have a solid remote DR infrastructure for HQ	Remote DR for HQ	8.75	7.38
2	Remote DR Infrastructure	Customer Satisfaction	The ability to provide DR infrastructure and capabilities for messaging at ODA	DR Infrastructure for ODA Messaging	9.38	6.13
3	Remote DR Infrastructure	Customer Satisfaction	The ability to integrate the DR/remote backup recovery planning efforts with the next generation data center infrastructure planning	Integration of DR Planning	8.38	7.38
4	Remote DR Infrastructure	Customer Satisfaction	The ability to allow the information system to be recovered and reconstituted to the system's original state after a system disruption or failure at HQ	Reconstitution at HQ	9.75	7.50
5	Network Analysis and	Customer Satisfaction	The ability to have access to a true data center at HQ	True Data Center at HQ	6.43	6.86

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
	Modernization					
6	Green IT	Green IT	The ability to host multiple applications in one physical server to save space and cost	Virtualization	6.75	4.86
7	Green IT	Green IT	The ability to optimize the size and configuration of servers	Optimization of Server Config	6.38	5.14
8	Green IT	Green IT	The ability to transition to cloud computing (at least a "federal cloud") if/when it becomes available in the future	Cloud Computing	5.13	6.29
9	Green IT	Green IT	The ability to better monitor and measure data center energy utilization	Monitor & Measure Energy Utilization	5.63	5.57
10	Green IT	Green IT	The ability to proactively manage power usage in the overall IT infrastructure	Proactively Manage Power Usage	4.71	5.00
11	Archival/Retrieval System for Email	Operational Efficiency	The ability to archive and retrieve emails	Archive & Retrieve Emails	8.88	5.38
12	Network Analysis and Modernization	Operational Efficiency	The ability to leverage Network and government-wide capabilities to save cost	Leverage Network	7.25	5.38

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
13	Expanded Processes	Operational Efficiency	The ability to provide agency-wide communication and training to have help desk calls routed properly	Training to Properly Route Help Desk Calls	7.00	5.25
14	Network Analysis and Modernization	Operational Efficiency	The ability to provide contingency for mainframe systems before LMAS is ready	Mainframe Contingency Before LMAS	8.29	6.86
15	Network Analysis and Modernization	Operational Efficiency	The ability to consolidate the current state processing for data centers	Data Center Consolidation	7.00	6.25
16	Network Analysis and Modernization	Operational Efficiency	The ability to transition the telephone service to VoIP	Transition to VoIP	5.63	5.50
17	Network Analysis and Modernization	Operational Efficiency	The ability to provide streaming video to the entire agency simultaneously	Simulcast of Streaming Video	6.88	5.63
18	Network Analysis and Modernization	Operational Efficiency	The ability to adapt to constantly evolving wireless devices and standards	Constant Wireless Evolution	8.00	5.75
19	Network Analysis and Modernization	Operational Efficiency	The ability to provide wireless network access (as needed) throughout the agency, regardless of location	Wireless Network Access	7.38	5.50
20	Expanded Processes	Operational Efficiency	The ability to better plan for implementation of ITIL service management	ITIL Planning	7.25	5.13

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
			processes.			
21	Expanded Processes	Operational Efficiency	The ability to have proactive storage capacity monitoring and forecasting	Storage Capacity Monitoring & Forecasting	8.00	5.50
22	Expanded Processes	Operational Efficiency	The ability to have proactive environmental requirement monitoring and forecasting	Environmental Requirement Monitoring & Forecasting	5.50	5.38
23	Expanded Processes	Operational Efficiency	The ability to have proactive network bandwidth monitoring and forecasting	Network Bandwidth Monitoring & Forecasting	7.50	5.25
24	IPV6 Upgrade	Operational Efficiency	The ability to plan for a broader scope IPv6 assessment to address issues such as software compatibility, network security, and IPv4/IPv6 dual stack network infrastructure design	Plan for Broader IPv6 Scope	6.13	6.75
25	Network Analysis and Modernization	Operational Efficiency	The ability to provide a network health analysis and identify areas for upgrades or re-design	Network Health Analysis	6.88	5.63
26	Expanded Processes	Operational Efficiency	The ability to enhance or initiate governance procedures to oversee ITIL	ITIL Governance	7.25	4.63

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
			service management services			
27	Expanded Processes	Operational Efficiency	The ability to ensure formal operational processes (e.g., incident management) are being followed	Enforce Formal Operational Processes	8.38	4.88
28	Expanded Processes	Operational Efficiency	The ability to define and formalize help desk processes	Define & Formalize Help Desk Processes	8.38	4.75
29	Expanded Processes	Operational Efficiency	The ability to include ODA infrastructure teams in HQ decision-making	Include ODA in HQ Infrastructure Decision Making	8.13	4.38
30	Expanded Processes	Operational Efficiency	The ability to utilize the expertise of a tech-focused procurement group, either within the government or private industry	Tech-focused Procurement Group	8.25	3.63
31	FDCC	Operational Efficiency	The ability to have 100% compliance with FDCC	100% Compliance w/ FDCC	7.63	6.75
32	Network Analysis and Modernization	Operational Efficiency	The ability to rationalize ODA Trio and Exchange servers	Rationalize ODA Messaging Servers	5.50	4.38
33	Network Analysis and Modernization	Operational Efficiency	The ability to leverage tools (e.g., Cognos, Primavera, etc.) between OCIO and ODA	Share Tools Between OCIO & ODA	7.00	3.75

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
34	HSPD-12	Operational Efficiency	The ability to coordinate HSPD-12/PIV cards with the HCM systems	Integration of HSPD-12 w/ HCM Systems	7.71	6.71
35	Expanded Processes	Operational Efficiency	The ability to consolidate incidents reporting through one help desk portal	Incident Report Consolidation	7.25	5.38
36	SOA Prep/Planning	Operational Efficiency	The ability to identify and reuse shared infrastructure services	Shared Infrastructure Services	7.00	6.25
37	SOA Prep/Planning	Operational Efficiency	The ability to implement processes, tools, and governance for a technology SOA delivery capability	SOA Delivery Capability	6.57	5.86
38	Expanded Processes	Performance Measurement & Monitoring	The ability to define and measure performance metrics for MSSS	MSSS Metrics	7.88	5.00
39	Expanded Processes	Performance Measurement & Monitoring	The ability to define and measure performance metrics for EUSS	EUSS Metrics	8.00	5.25
40	Expanded Processes	Performance Measurement & Monitoring	The ability to define and measure performance metrics for TSS	TSS Metrics	8.13	5.00

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
41	Expanded Processes	Performance Measurement & Monitoring	The ability to define and measure performance metrics for Security	Security Metrics	8.50	5.88
42	Expanded Processes	Performance Measurement & Monitoring	The ability to define and measure performance metrics for SOA	SOA Metrics	7.14	6.00
43	Expanded Processes	Performance Measurement & Monitoring	The ability to provide overall metric capturing and monitoring	Overall Metric Capturing & Reporting	8.25	6.63
44	HSPD-12	Security & Privacy	The ability to communicate HSPD-12 requirements, processes, and lead time for processes to SBA staff and executives to ensure that HSPD-12 processes are not compromised	HSPD-12 Planning & Governance	7.88	4.88
45	Network Analysis and Modernization	Security & Privacy	The ability to provide centralize logging and auditing as well as application and database intrusion detection	Centralized Security Monitoring	7.63	6.13
46	TIC	Security & Privacy	The ability to coordinate TIC with IP based security	TIC Security	6.63	6.88

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
			restrictions			
47	Network Analysis and Modernization	Security & Privacy	The ability to provide remote/wireless access to the SBA network with full security	Wireless Network Access w/ Full Security	7.25	6.50
48	Expanded Processes	Security & Privacy	The ability to improve incident response capabilities	Improved Incident Response	8.25	6.00
49	Expanded Processes	Security & Privacy	The ability to monitor software usage restrictions and user installed software	Monitor Usage & Software	9.13	4.75
50	Expanded Processes	Security & Privacy	The ability to compile audit records from multiple components throughout the system into a system-wide, time-correlated audit trail	Centralized System Auditing	7.75	5.88
51	TIC	Security & Privacy	The ability to follow the TIC guideline to identify internet connections that should be removed, modify the network topology, and plan for contingency to address the identified connections to be removed	Follow TIC Guidance	7.38	5.75
52	Expanded Processes	Security & Privacy	The ability to ensure that security compliance and measures are included in outsourcing contracts	Include Security w/ Outsourcing Contracts	9.38	5.38

#	Initiative	Category	Opportunity	Title	Business Need Average	Implementation Difficulty Average
53	Expanded Processes	Security & Privacy	The ability to ensure applications meet security measures and standards	Application Security Measures & Standards	9.13	5.88
54	Expanded Processes	Security & Privacy	The ability to comply with all NIST security guidelines	NIST Security Compliance	7.50	6.75
55	HSPD-12	Security & Privacy	The ability to leverage the HSPD-12 platform to standardize the IT security framework	Leverage HSPD-12 to Standardize Security	7.25	7.13
56	HSPD-12	Security & Privacy	The ability to leverage HSPD-12 platform to streamline physical and logical access control processes	Leverage HSPD-12 to Streamline Access Control	7.25	6.88
57	HSPD-12	Security & Privacy	The ability to leverage the HSPD-12 platform to streamline the network authentication process	Leverage HSPD-12 to Streamline Network Auth	7.75	6.88
58	HSPD-12	Security & Privacy	The ability to leverage the HSPD-12 platform for simplified authentication and access control to SBA enterprise applications	Leverage HSPD-12 to Simplify App Auth & Control	7.13	7.00
59	SOA Prep/Planning	Security & Privacy	The ability to integrate security and policies throughout the SOA planning and implementation processes.	SOA Security	7.88	7.00

7 Risk Management

No business transition strategy or major IT implementation is without risk. The table below summarizes the risks evident at this point, together with strategies for mitigating those risks. As new risks appear, each must be tracked and resolved, as the OCIO moves through the infrastructure roadmap toward the target state.

TABLE 13: RISKS AND MITIGATIONS

Risks	Mitigation
Budget and Resources	
<ul style="list-style-type: none"> * Assigning value to infrastructure expenditures can be difficult, as they often lead to improved performance for other systems, but not directly to the OCIO. * Outsourcing may require additional contract-management skills that existing technical staff do not have. * SBA may not have the skill sets in-house required to execute on all these initiatives. * As infrastructure footprint shrinks, watts usage per square foot may increase. 	<ul style="list-style-type: none"> * Use reuse or improved customer service as a value measurement, rather than financial considerations alone. * Adopt an Agency-wide perspective on costing that assigns value to OCIO efforts. * Train appropriate staff to manage outsourced projects and contract agreements. * Provide additional training in conjunctions with using contractors with necessary expertise. * Calculate usage based on total building square footage, rather just OCIO usage.
Technology	
<ul style="list-style-type: none"> * SOA will require an additional layer of planning for updating or developing systems. * Changes to the network could cause unexpected capacity or availability issues. * ITILOB is still maturing, and new recommendations will come out over the period covered by this roadmap. * Any data center move is technically challenging, especially to maintain continuity of operations during the transition. 	<ul style="list-style-type: none"> * Develop a service catalog for developers to use. * Establish process and require participation for evaluating the affect of the network changes. * Evaluate each new recommendation. Adopt a bias towards federal shared solutions. * Detailed planning, which may include phased cutover.
Compliance/Policy/Governance	
<ul style="list-style-type: none"> * SBA staff may resist formal processes. * Compliance with OMB mandates may be compromised if milestones pass without action. * Requirements may change with the new administration. 	<ul style="list-style-type: none"> * Establish Office-wide value of participating in process requirements. * Include process participation in staff performance goals, particularly ITIL training.