

**Office of the Chief Information Officer  
Operational Information Technology Plan**

*FY 2004 – FY2005*



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*Chapter 1  
Infrastructure and Office Automation  
Initiatives*



# CHAPTER 1

## INFRASTRUCTURE AND OFFICE AUTOMATION INITIATIVES OPERATIONAL INFORMATION TECHNOLOGY PLAN

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## 1.0 Overview

Agency and business area strategic visions, goals, and objectives indicate the direction necessary to successfully perform the USPTO mission. Using the framework of governing strategies and program objectives as guidance, strategic information technology projects are the high-level operational action plans that provide more specific details about how information technology will be used to implement this direction.

Each business area has ongoing and planned efforts to develop new AISs and enhance existing AISs to improve mission performance. To maximize investments in infrastructure technology, USPTO has established an Enterprise Architecture that provides enterprise-wide services. These services are provided by shared resource organizations in the following areas:

- **Enterprise Architecture**: Provides a “blueprint” to define, develop, implement and maintain the USPTO’s current (baseline) and desired (target) architecture, as well as transformation-sequence plan for the management of the USPTO information technology investments.
- **Enterprise Application Integration Middleware**: Establish, maintain, and support enterprise-wide architecture infrastructure;
- **Network Perimeter and Infrastructure**: Provide an enterprise-wide network and infrastructure that is secure and reliable; and
- **OCIO Program Support Services**: Provide program assistance to maintain the strategic focus on IT management and offer the highest level of IT products and services through quality assurance.

The resulting IT product and service infrastructure supports the entire USPTO. This chapter provides a detailed description of all ongoing and planned information technology infrastructure projects.

## 1.1 Enterprise Architecture

An Enterprise Architecture is a strategic information master plan (or blueprint) that defines the mission, the information necessary to perform the mission, the technologies necessary to perform the mission, and the transitional processes for implementing new technologies in response to the changing mission needs. The Enterprise Architecture includes the baseline architecture, the target architecture, and the transformation-sequencing plan that migrates the current (baseline) architecture to the target enterprise architecture. The USPTO Enterprise Architecture, integrating with USPTO *21<sup>st</sup> Century Strategic Plan* and OCIO *Strategic Plan*, provides linkages to the USPTO information



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technology capital planning and investment control (CPIC) process, the OMB Exhibit 300 budget justification and reporting requirements for major IT investments, as well as the management of capital assets. The USPTO Enterprise Architecture supports the OCIO information technology strategic goals, ensuring that USPTO's information technology is aligned with the Federal Enterprise Architecture for electronic government (e-Gov) initiatives, components reused and infrastructure interoperability. These provide information sharing internally within the USPTO and externally across federal agencies, as well as with the USPTO international business partners.

The USPTO Enterprise Architecture comprises five integral sub-architectures: Business Architecture, Data Architecture, Application Architecture, Technology Architecture, Information Technology Security Architecture. The USPTO has officially established the Enterprise Architecture Program Management Office to manage, monitor, and control the development, use, and maintenance of the USPTO enterprise architecture. Each of the sub-architectures is aligned within the USPTO Enterprise Architecture Program Management Office to assume its specific portions of responsibilities for business, data, application, technology, and information technology security. The Center for Excellence is delineated as a proving ground for Enterprise Architecture compliant solutions and services that support the broad range of information technology disciplines, and concepts that are to be developed within the USPTO.

#### 1.1.1 Infrastructure Architecture Support

##### a. Description

Support for Infrastructure Architecture provides architecture services to all AIS projects. Along with their importance in the capital planning and investment management area, the enterprise architecture provides a snapshot in time of the USPTO's business and technology assets. The enterprise architecture is the blueprint to build upon the roadmap to systems and business migration, and the management tool that guides information technology investment decisions.

Under OMB Circular A-130, *Management of Federal Information Resources*, all agencies are required to document and provide their Enterprise Architecture to OMB as significant changes are incorporated. Under the President's FY 2005 Budget Preparation process outlined in the revised Circular A-11, agencies must align their budget justifications and map their major IT capital investments to Federal Enterprise Architecture reference models: e.g., Business Reference Model (BRM), Performance Reference Model (PRM), Service Component Reference Mode (SRM), and Technical Reference Model (TRM).

The USPTO has established Intranet web-based Enterprise Architecture Team Room Web pages. The Team Room Web pages serve as a central repository for USPTO enterprise architecture work products, and the OMB compliant enterprise architecture



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reference models, such as BRM, SRM, and TRM. The Team Room Web pages provide an area where users can find, share, download, and evaluate the enterprise architecture artifacts or working products. The seven volumes of work products are used as basis for the development, use and management of the baseline and target enterprise architecture. They describe the goals, objectives and overall progress of USPTO Enterprise Architecture. Each volume focuses on a specific sub-architecture (business, data, applications, technology, information technology security) of oversight and governance strategies.

The USPTO Enterprise Architecture TRM provides a foundation to describe the standards, technologies, specifications or products that collectively support the delivery, exchange, and construction of the USPTO automated information systems, the component-reused applications and the core technologies that support the transition towards interoperable electronic-government (e-Gov) solutions. The USPTO Enterprise Architecture Technical Reference Model version 7.0 is developed based on the framework published by the OMB's Federal Enterprise Architecture Program Management Office (FEA-PMO).

The TRM and its associated standards and products profiles, along with e-Business patterns are integral components of the USPTO enterprise architecture. The TRM provides layers and interrelated set of models that allow for organizing, planning, and building an integrated set of information and information technology architectures.

The purpose of the TRM is to guide the USPTO information technology investments, and to provide a set of consistent agency-wide standards and products. These standards and products will also serve as a guide for project managers, system development managers, and acquisition project staff for: (1) acquiring IT products and services; (2) developing and maintaining AISs; and (3) designing the information technology infrastructure.

The USPTO TRM was initiated in August 1994. Since its first publication in October 1995, the TRM has been an instrumental tool to gradually migrate the USPTO information technology infrastructure towards a standards-based open systems environment. The availability of the Internet and the enterprise-wide adoption of the TRM within the USPTO have resulted in the need to restructure and enhanced the existing TRM. The restructured TRM will provide more flexibility as well as potential enhancements to adopt and insert into the Model many new or emerged technologies, standards and products as they matured.

The USPTO mission and business functions provide the fundamentals for the establishment of the TRM, thus the restructured TRM implicitly maps not only the goals of the USPTO with that of the Department of Commerce (DOC) but also identifies the critical strategic compass that provides the linkage of the USPTO strategic goals with that of the OCIO.



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#### **b. Commitments and Benefits**

The development and maintenance of the TRM are enterprise architecture functions that support the USPTO major business areas as well as information technology infrastructure projects. The TRM enables the USPTO to maintain current business production, improve, and enhance current business and IT infrastructure, migrate automated information systems to operate on an evolving infrastructure, and enhance and improve the tailored LCM. The standardization of patterns for business topologies will promote the architectural reuse and enhance USPTO IT architecture framework.

The TRM serves as the focus to direct the acquisition, design, development, and maintenance of the USPTO's AISs and IT infrastructure within the bounds of USPTO designated standard products. The security and authenticity of electronic information will be enhanced through application of the standards; the acceptance of electronic records as valid legal documents based on standards, which are recognized by the legal establishment, will offer protection in the electronic workplace era that exceeds that of today's paper workplace. The TRM supports the USPTO strategic IT goals to:

- Promote architectural reuse through standardization of patterns for business topologies and runtime pattern process;
- Respond quickly to changing business requirements by leveraging a managed IT infrastructure;
- Maintain production-processing capability in response to increasing workload demands;
- Promote vendor independence through the use of standards-based products and interchangeable components;
- Improve development efficiency across the USPTO business areas through a common open systems environment and resource sharing; and
- Improve interoperability across USPTO applications and mission areas through common infrastructure components and services.

The enterprise architecture process is a long-term, continuous effort. Once developed, the enterprise architecture is a "living" entity with many parts, whether in the form of a document, database, repository or Web page. To remain current and have optimal value, this "living architecture" needs continual care and maintenance. USPTO commits every effort to ensure its Enterprise Architecture reflects the impact of ongoing changes in business function and technology on the enterprise, and in turn, supports capital planning and investment management in keeping up with those changes. Each component of the



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Enterprise Architecture – baseline architecture, target architecture, sequencing plan, and all the products that constitute them – are maintained and kept accurate and current.

### 1.1.2 Technology Assessment and Insertion Program

#### a. Description

There are two types of the Technology Assessment and Insertion Programs. First, the Strategic/Tactical Enterprise Architecture Assessments are needed to position USPTO with an enterprise-oriented, integrated, and coordinated approach to implement key critical emerging and enabling technologies. This Program includes coordinating/setting strategic direction through the Technical Working Model vehicle and Technical Working Group structure as necessary to meet IT planning objectives. Second, the support for functional assessments is needed to implement the major enabling technologies as required to meet USPTO business objectives. The functional assessments include such projects and activities as knowledge management/e-learning, intelligent searching, customer self-service/Customer Relationship Management, workflow/document management, and web portal for Electronic Commerce (e-Commerce) and Electronic Government (e-Gov) developments.

#### b. Commitments and Benefits

The Strategic/Tactical Enterprise Architecture Assessments represents an advance engineering effort and technology forecasting that helps in defining a large-scale, enterprise-level architecture. This level of effort will enable the USPTO to be in the forefront of the technology curve in a cost-effective, integrated fashion as required. The OCIO's primary goal of achieving/maintaining an open systems environment with all of its associated benefits, costs, and reliability will be realized. Neglecting strategic, enterprise-level, architecture engineering will critically impair major functions such as security, Electronic Commerce (E-Commerce), scalability/performance, and industry driven trends such as web services.

Conducting functional assessments will enable the USPTO to implement the strategies in the form of an "up-to-date" infrastructure. The USPTO will develop the foundation to support specific projects that are requested and required by the business areas. The emerging and enabling technologies are directed toward patent and trademark business applications during this assessment.

The USPTO Architecture Review Board (ARB) reviews and examines the variety of business and technical issues that are required in the future-oriented USPTO Enterprise Architecture. The ARB will form the technical working groups, as needed, to select, evaluate, and recommend, based on business need, or for inserting new or emerging technologies. The ARB is a cross-functional board that provides resources to foster



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broad involvement in the ongoing development and governance of the USPTO Enterprise Architecture.

### 1.2 Enterprise Application Integration Middleware

This portfolio provides the infrastructure and development tools for the Center of Excellence for Technical Services and Solutions. The Center for Excellence provides a testing ground for enterprise architecture compliant solutions and services that support the broad range of information science disciplines (e.g., business, data, application, and technology engineering). The Center manages and leads the USPTO Integrated Development Environment (IDE) and research and development laboratory facilities. The development tools and infrastructure are used in the following purposes:

- Enterprise Architecture Compliance best practices proving ground;
- Enterprise Application Integration (internal) best practices;
- Business-to-Business Integration (external) best practices;
- AIS development best practices;
- Layered reuse best practices (e.g., patterns, integration, objects);
- Applying pattern frameworks to the development lifecycle;
- Information security best practices (e.g., technical vulnerability assessment tools and methods); and
- Research and development clearinghouse.

#### 1.2.1 Emerging Technology Center

##### a. Description

The Emerging Technology Center (ETC) operates the Center of Excellence infrastructure (e.g., IDE) and an advanced presentation center. This Center provides tools, procedures, and engineering support to system developers in support of the evaluation of leading-edge technology, development and test of prototypes, and test and evaluation of pilot systems before introduction into the infrastructure. The ETC supports current and new projects into the future, including IDE, Image File Wrapper (IFW), Trademark Information System/Madrid (TIS/Madrid), and other new development efforts.

##### b. Commitments and Benefits

The ETC provides a controlled environment to develop and test business critical AISs for functionality, performance, and disaster recovery. All projects that use the development environment benefit from the products and services provided by the ETC to ensure that development infrastructure can be successfully integrated with existing business systems.



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### 1.2.2 Enterprise Application Integration Solution

#### a. Description

In FY 2002, the USPTO initiated the Enterprise Application Integration (EAI) hub in support of its E-Gov strategy. The EAI provides infrastructure framework for various AISs to share information and services across heterogeneous environments. The EAI entails integrating applications and enterprise data sources so that they can easily share business processes and data with minimum changes to the existing applications. The infrastructure is the underlying hardware and software framework that links systems together via a common, standard hub. In addition, the IDE represents a project from the Executive for Architecture, Engineering, and Technical Services (E-AETS) and Center of Excellence to establish a common environment to support AIS development, leveraging Java 2 Enterprise Edition (J2EE) solutions, and available COTS products. The intent is to provide infrastructure of consolidated servers and development tools that will be highly scalable, readily available, and promotes reuse of an EA environment for all new software development efforts as well as the migration from COOL: Gen to a J2EE architecture. Using the IBM WebSphere family of products, the IDE provides an infrastructure to promote integration and testing of platform-independent J2EE solutions, conforming to the USPTO Enterprise Concept Architecture and driving the CIO's vision for an enterprise-wide approach for IT development at USPTO. The IDE includes two environments: the System Integration Testing (SIT) Environment for system integration, and the Functional Qualification Testing (FQT) Environment for FQT that is conducted by Configuration Management (CM).

#### b. Commitments and Benefits

The EAI lays the groundwork for the OCIO to implement the OMB's business approach to IT development and management by providing a consolidated production environment that conforms to the USPTO Enterprise Concept Architecture, emerging Federal standards, and industry-standard practices. The infrastructure is highly scalable, readily available, and emphasizes the reuse of EA compliant artifacts for all new AISs. As a result, individual AISs do not have to a) purchase the server hardware; (2) purchase software licenses; (3) set up and configure servers; and (4) hire system administrators to manage the middle-tier server. These steps produce considerable savings in money and time. In general, the System Development Managers can concentrate on the business domain logic and application specific issues and focus on the users' requirements and demands. Since the production system is very similar to the FQT environment and the deployment in FQT and production environment is almost identical, deployment becomes an easy task. The EAI has additional benefits as listed:

- Provides a common set of standards that can be used by all stakeholders (including business users, developers, architects, etc) to capture the business or operational process, define the EA and identify the support systems;



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- The UML enables system relationships to be more easily represented, communicated, and understood;
- Facilitates communication and uncovers errors more easily than other approaches;
- Introduces a level of predictability to enterprise development with traceability;
- Generates considerable savings on software development and maintenance expenses. Industry statistics suggest that the median relative cost for reuse is 20% of the effort for new development if reuse is applied appropriately;
- Provides faster completion of software development efforts resulting in rapid deployment of new or updated USPTO applications;
- Opens the USPTO's opportunities to reuse the assets from industry and provide the opportunity to share assets among various Federal Government agencies, e.g., OMB;
- Enables the development teams to quick start their application development process through industry standards, proven reusable and extensible templates, and enhanced tool automation; and
- Adopt industry standards as defined by the Reusable Asset Specification (RAS).

A consolidated environment will also make it possible to provide full-time expert support in the WebSphere family of products, which will increase the quality of production supports for the middleware servers. This capability will enable the OCIO to implement the OMB's FEA framework to support E-Gov projects, and at the same time, comply with its own vision of how the USPTO EA needs to be implemented to support its patent and trademark business process. The IBM WebSphere family of products was selected to support the OCIO's development, execution, and operation of web browser and client based applications, as it provides the most comprehensive set of functions that will allow USPTO to achieve its goals. The WebSphere is composed of several independent components that integrate together to provide an overall net-centric capability. The business value of the WebSphere family of products is necessary for the following reasons:

- Required for supporting various Federal E-Gov initiatives;
- Improves and enhances the current business model with E-Commerce, and adds new capabilities to achieving the future electronic workplace;
- Provides a maintainable, extensible, manageable solution that encourages and facilitates reuse and reduces development time by leveraging the architecture;
- Provides value by adopting existing legacy applications and standardizing the architecture; and
- Allows the OCIO to maintain, operate, and support the USPTO technical environment so that the end-user needs are met in the most cost-effective manner.

### 1.2.3 Enterprise Portal Service

#### a. Description



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The USPTO migration to the Enterprise Concept Architecture will give employees and, in some cases, customers web-based access to USPTO AISs through Enterprise Portal Services (EPS). The OCIO has developed a target Enterprise Concept Architecture that is component based and web-enabled. This enables USPTO to replace its intranet web site with one that provides personalization and expanded access to AISs. From the user perspective, the user gains a content presentation and user interaction through the portal, dedicated areas for specific application access, aggregated presentations, single sign-on, and one management point for access. Portals reduce complexity for centralized user and content management.

#### **b. Commitments and Benefits**

The EPS provides a portal based applications in a consistent manner across the enterprise, thereby, giving the maximum availability of computer services to the USPTO user community. In addition, the key functions and value for the USPTO are as follows:

- Foster reuse of system components across the enterprise;
- Implement the Active Directory to provide a single customized and personalized access point into information;
- Organize and deliver structured and unstructured data, syndicated content, and application data in a highly-effective and efficient means;
- Adhere to OMB Enterprise Architecture guidelines;
- Enhance and simplify the enterprise architecture and reduce development schedules; and
- Provide maximum availability of computer services to USPTO users.

#### **1.2.4 Software Developer Infrastructure Desktop Deployment Support and Testing**

##### **a. Description**

This project provides support for building deployment packages to all user desktops. The deployment packages include installation of executable applications and wrappers in addition to ghost images for use by the Desktop Services Division. The Software Developer Infrastructure (SDI) also includes tests and approval of COTS.

##### **b. Commitments and Benefits**

The use of deployment packages has several features that are necessary part of software development as follows:

- Enables the capability for mass release of new software;



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- Provides controlled release of limited-license software as requested;
- Enables testing and approval of new COTS software for compatibility with baselines;
- Deploy software changes rapidly to user desktops and avoid individual, manual efforts that are costly and time consuming;
- Fosters less on-site visits, minimal interruption, faster service, and greater user satisfaction with remote installs;
- Allow for faster deployments of new hardware (ghost images easier to install and less prone to error) through automated install procedures;
- Ensure no downtime or lost productivity for users by testing COTS against baseline;
- Produces finished products that are of higher quality, resulting in greater chances of a successful first push;
- Provides a direct line of communications with customers for better support and service;
- Improves overall external coordination of efforts with System Development Managers and customers; and
- Reduces lag time in deployments.

### 1.2.5 Software Developer Infrastructure

#### a. Description

The following projects define the SDI project:

- **Microsoft Consulting**: Contractor support services from Microsoft are necessary for on-going efforts to ensure that various applications continue to operate at optimum levels. Software upgrades and patches delivered under Microsoft Developer Network (MSDN) subscription often require on-site Microsoft support to implement and configure. Additional technical support services (for advanced problem resolution) are used and needed;
- **Automated Developer Environment – Development/Acquisition**: This project is required to give the OCIO the capability to investigate and evaluate new IT technologies, technologies and products to determine their feasibility and potential applicability to USPTO's infrastructure and architecture, to keep up with the increasing demands on its resources. Software development and acquisition efforts apply several different approaches that include pilot projects, working demonstrations, competitive process of elimination, and adequacy of vendor support. This project is part of an overall strategy of product evaluations and market assessments that include participation at industry conferences and symposia. The results of these evaluations are provided at the conclusion of each effort, along with recommendations;



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- **Automated Developer Environment – Enhancements/Upgrades**: This effort is consistent with the need to ensure that USPTO uses the latest IT techniques, technologies, and trends to keep up with the increasing demands on its resources (faster queries, increased throughput, greater security). Software enhancement and upgrade efforts apply several different approaches, including but not limited to, pilot projects, working demonstrations, competitive process of elimination, and vendor support. In addition, this activity is integral to the overall strategy of product evaluations and market assessments that include participation at industry conferences and symposia and the use of external industry expertise. The results of these evaluations, with alternatives, are provided at the end of each effort, along with the recommended approach. Current applications using COOL: Gen 5.1 can continue using this technology and upgrade to AG version 6.5 if the business case justifies the upgrade, while other applications may migrate to a Java / J2EE architecture. All systems will have to first upgrade to AG version 6.5 in the short-term. Other efforts include a Reusable Assets Strategy and establishing a components library;
- **Automated Developer Environment – Maintenance/Operations**: This project includes maintenance and continued support of OCIO-wide development infrastructure operations, such as the COOL: Gen encyclopedia, and the interfaces between the projects' application code and the environment normally managed by the SDI group. Assistance is also provided in resolving suspected problems with these interfaces. The development environment maintained by SDI consists of the COOL: Gen toolset (client-side as well as server-side utilities) and associated encyclopedia containing modes developed for multiple projects that reside on various development and production servers, and the IBM family of products that include WebSphere, QuickPlace, SameTime, and Rational Studio Enterprise for UML and ClearCase development. Support is provided in maintaining this environment in multiple ways: (1) daily performance tuning; (2) maintenance during core hours; (3) off-hours support as necessary; (4) periodic upgrades; and (5) interfacing with Database Administrators (DBAs), SDMs, and project development staff;
- **Components – Development/Acquisition**: This effort ensures that software reuse practices can be incorporated into as many in-house applications as possible through the use of software components that are either purchased commercially or developed in-house. The purpose is to reduce development time and risk, and promote consistency while ensuring that USPTO employs the latest IT techniques, technologies and trends to keep pace with increasing demands on its resources;



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- **Enterprise Software Licenses/Maintenance**: This project provides funding for annual maintenance/subscription fees to ensure that USPTO continues to receive technical support and the latest upgrades from the vendors;
- **System Developer Tool Support (Technology Working Groups - TWGs, Tools, Developer Direct Assistance)**: The System Developer Tool Support focuses on continuous assessment of industry trends and market direction, participations in technical discussions (internal and external to USPTO), evaluation of products (including Section 508 accessibility), and recommendations on technical issues that SDI believes to be in the best interest of ensuring that USPTO's business needs are met. This effort includes assistance to developers in implementing new software or in adopting new technologies; and
- **Software Developer Tools – Acquisition**: This project enables the USPTO to continuously investigate new technologies and techniques for relevance and potential implementation to assist application developers in their development efforts.

#### b. Commitments and Benefits

The services that are provided by the Software Developer Infrastructure enable several capabilities for USPTO as follows:

- Reduced turnaround time in resolving problems;
- Improved response time to customers;
- Impart knowledge directly from Microsoft to USPTO developers;
- Enable continuity of operations during regular and off-hours;
- Enhanced overall support to the development infrastructure and environment;
- Provide general development and maintenance assistance to specific projects as needed;
- Allows USPTO to remain current with technologies of its Federal and Industry counterparts;
- Prevents technology obsolescence;
- Keeps employees interested and involved (higher morale and lower turnover);
- Increased performance and delivery of service;
- Ensures architectures that scale properly with growth;
- Allows for software to be readily replaced, upgrade, or maintained;
- Purchased components can be customized to USPTO's specific needs;
- Reduces overall development and maintenance costs among projects;
- Improved turnaround time in diagnosing problems and implementing software fixes;
- Enables adoption of latest industry standards;



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- Provides access to updated device drivers for new hardware, new operating systems, etc.;
- Ensures that balanced, rational, and technically sound decisions are made;
- Allows feasibility and viability assessments of products for potential use at USPTO;
- Increases customer base due to greater accessibility for disabled individuals (American Disabilities Act);
- Increases pool of potential candidates for employment (American Disabilities Act); and
- Allows USPTO to remain current with technologies used by its Federal and Industry counterparts.

### 1.2.6 Software Developer Infrastructure – Shortfall Project

#### a. Description

The OCIO is required to implement the OMB's FEA framework to support e-Government projects and implement the USPTO EA to support its business areas, especially patent and trademark business areas. The SDI Shortfall Project supports the USPTO AA that consists of several key architectural components that partition the functionality of the AA into manageable subsets. For each subset, the AA identifies appropriate COTS products to complement the AA. The key architectural components of the AA consist of the Edge server, HTTP server, WAS, WebSphere Portal, Lotus Quickplace, and SameTime. These technologies support the OCIO's development, execution, and operation of the USPTO Enterprise Architecture.

#### b. Commitments, Benefits, and Performance Measures

This activity improves the ability of the USPTO to make a commitment to its enterprise architecture through the following capabilities:

- Improves and enhances the current business model with electronic commerce, and adds new capabilities to achieving future electronic workplace;
- Ensures that USPTO complies with various Federal e-Gov projects;
- Provides a maintainable, extensible, manageable solution that encourages and fosters reuse and reduces development time by leveraging the architecture;
- Provides value by adopting existing legacy applications and standardizing the architecture; and



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- Allows the OCIO to maintain, operate, and support the USPTO technical environment such that the end-user requirements are satisfied in the most cost-effective manner.

### 1.3 Network and Infrastructure

USPTO provides enterprise-wide IT services in network and infrastructure. These services are provided by shared resources organizations that: evolve the information technology infrastructure, operate and maintain production systems and networks, manage and support desktop hardware/software and provide customer support, define data access, and archive data. The USPTO has also established a managed, comprehensive enterprise-wide IT security program. Plans, projects, and details associated with this enterprise-wide security initiative will be contained, tracked and maintained in a separate document that will not be released to the general public. The resulting IT product and service network and infrastructure support the entire USPTO.

#### 1.3.1 Network Perimeter

Today, open business environment involves providing easy access to the corporate network for variety of constituents, including contractors, partners, and customers. The Network Perimeter project establishes remote connection for interconnectivity with applications from external environments, and provides means to control traffic through a secure corporate network. The USPTO corporate network supports the necessary business functions by allowing transactions such as payroll processing, Human Resources (HR) data processing, telecommuting, and other activities to occur within a secure environment. There are six systems that support the Network Perimeter activity: (1) Office of Finance Disbursement Network (OFDnet); (2) Office of Human Resources Network (OHRnet); (3) Remote Access Support; (4) Trademark Trial and Appeal Board (TTAB) Work@Home; (5) Trademark Work-At-Home Capability (TW@H); and (6) Trilateral Network (Trinet).

##### 1.3.1.1 Office of Finance Disbursement Network

###### a. Description

The USPTO Office of Finance requires uninterrupted disbursement and payroll processing. To achieve this business function, a secure extranet is being implemented and improved with full redundancy and high availability for direct connection to the National Finance Center (NFC) and the U.S. Treasury. OFDnet provides the connection.

###### b. Commitments and Benefits

Enabling a secure and reliable payroll file transmission with NFC are fulfilling the commitment to customers and staff. There is also secure and reliable financial file



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transfers to U.S. Treasury. Both of these connections are performed through the extranet that has secure integration with the Momentum system. As a result, the benefits include an uninterrupted payroll and disbursement processing at USPTO. A direct and secure payroll and financial file transfer between USPTO and NFC/U.S. Treasury is made possible. The data flow ensures the privacy, integrity of payroll, and financial data in transit. This effort makes Time and Attendance data possible and makes payroll operations available.

#### **1.3.1.2 Office of Human Resources Network**

##### **a. Description**

The purpose of the Office of Human Resources Network (OHRnet) is to enhance its fail-over features, performance, and security to allow the Office of Human Resources (OHR) personnel to process, transmit, and receive personnel information from and to the NFC with minimal loss of time and to support other PTO systems (i.e., Time and Attendance transmission, Online SF50 printing, and Momentum) and networks (OFDnet and PTONet II). The purpose of this system is to offer a continued enhancement approach to ensure that necessary network and security improvements are implemented in a timely fashion and are supported by the OCIO throughout its useful life.

##### **b. Commitments and Benefits**

The OHRnet provides a secure and reliable bi-weekly Time and Attendance (T&A) data transmission to NFC through PTO extranet. The online SF-50 printing capability is secure and reliable as well. The communication between OHR systems and the NFC is conducted within a secure platform, just as the interconnection between OF Momentum and NFC. There is secure integration with the OFDnet, Web Time and Attendance System (TAAS), and secure interconnection with PTONet. In addition to meeting these customer commitments, the OHRnet benefits both customers and staff through (1) Direct time and attendance transmission to the NFC; (2) Direct SF-50 printing to the NFC; (3) Secure high-speed communication between USPTO OHR systems and the NFC; (4) Privacy and integrity of personnel and financial data in transit; and (5) Support for TAAS.

#### **1.3.1.3 Remote Access Support**

##### **a. Description**

Currently, the Patent Business Area requires support for contractor staff in three remote sites. The two remote sites in Pennsylvania are to only receive telephone support. The other remote site at Bailey's Crossroads in Virginia is to receive both telephone and full-time, on-site support to meet four-hour Service Level Agreement.



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#### **b. Commitments and Benefits**

The Remote Access Support project is meeting the commitments to the customers by providing on-site desktop and telephone support to the Patent Business Area contractors to resolve computer issues for 36 workstations in addition to the workstations at the Virginia site in Bailey's Crossroads. In addition, the benefits for both the customers and staff are to ensure that problem resolution and service request is completed in a timely manner within the Service Level Agreement. This effort also meets customers' requirement of on-site desktop support.

#### **1.3.1.4 Trademark Trial and Appeal Board Work@Home**

##### **a. Description**

The TTAB is an administrative tribunal empowered to determine the right to register, and the subsequent validity of a trademark. The TTAB adjudicates the rights of parties in specific types of proceedings such as oppositions, cancellations, interferences, concurrent use, appeals from refusals by the Office to register a mark and extensions of time to file a proceeding. In addition, the TTAB receives other related documents and phone inquiries resulting in a high volume of paper and data exchange.

The TTAB Information System (TTABIS) provides the ability to enter data, prepare correspondence, track cases, generate reports for management, and monitor proceedings in an effective, secure, and timely manner. TTAB proceeding information is also available over the Intranet and Internet. Customers can use the Internet to file proceedings via email or via fax and the electronic submissions will be integrated directly into the TTABIS workflow. There are currently 15 TTAB Work@Home users (in FY 2003) accessing TTABIS and PTONet e-mail from home using laptops. This project provides for converting the current laptops to XP, migrating the system to a Citrix server functionality and adding users as described.

##### **b. Commitments and Benefits**

The TTABIS supports the Trademark Business Area macro performance goal of enhancing trademark protection. The TTAB Work@Home project provides contractor support to maintain the TTABIS, supplies documentation so that the help desk can support the project, migrate users to the Citrix servers, and add more users. In addition to meeting the commitments to the customers, the benefits to be derived from this system are to (1) provide users with contractor support; (2) provide users with help desk support; (3) promote telecommuting in accordance with Congressional direction; and (4) align operational support with other telecommuting solutions.



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#### 1.3.1.5 Trademark Work-At-Home Capability

##### a. Description

The TW@H program began as a pilot in March of 1997. Each examining attorney in the original program worked at home three days per week and shared an office at the official work site with another work at home attorney. In November of 2001, a hoteling pilot was initiated in which Work-at-Home participants spent 90 per cent of their workweek at home and four hours per week at the official work site. Hoteling participants are not assigned a personal office, but they may reserve an office to use when they come in to the official work site. In FY 2004, this project accommodates the Trademark Office adding approximately 40 participants to the TW@H program.

In terms of system upgrade, the TW@H is followed by TW@H II that is an infrastructure enhancement to the TW@H production system. The TW@H II system allows Trademark attorneys to work at home and to remotely connect to PTONet resources. The primary connection method to PTONet is provided through Digital Subscriber Line (DSL) connection, Cable Internet, Integrated Services Digital Network (ISDN) connections, or a secure Virtual Private Network (VPN). The secondary connection method is through a dialup modem to the Mail@Home servers.

The major function of the upgraded TW@H system is to provide secure and reliable access to Trademark applications with an enhancement and update of the Citrix Metaframe server infrastructure. The upgrade is expected to include 20 new production servers and Windows 2K Terminal Server. Other capabilities consist of office applications through Office 2000, FAX capability through RightFax, and e-mail through MS Outlook. The Participants will also have access to other USPTO systems, including X-Search, Trademark Application Management (TRAM), Trademark Image Capture and Retrieval System (TICRS), Trademark Tradeups System (TRADEUPS), and TIS/Madrid (in the near future). Telephone service with voicemail should be available as well.

##### b. Commitments and Benefits

The TW@H program is meeting Congressional mandate by establishing a policy under which eligible employees of the agency may participate in telecommuting to the maximum extent possible without diminished performance. In terms of business results, the Work-At-Home participants have contributed to lower pendency numbers because they are more productive and spend more time examining trademark applications than examining attorney's in the office. The quality of work has been as good if not better than the general work force and their customer service has been excellent. Customer satisfaction has remained high; the Work-At-Home program is generally transparent to the customer.



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Employees are satisfied as well. Participants report a better ability to balance work and family issues because of the time saved commuting. They also enjoy personal cost savings for work related commuting expenses. Work-at-Home participants also have a higher retention rate than other employees. For each employee retained, the organization saves the expense of hiring and training a new employee.

In addition to meeting the commitments to the customer and the staff, the benefits of the Work-At-Home program are as follows:

- While the Trademark Work-at-Home program as initially conceived saved some office space by doubling employees, the hoteling program has proven the potential for enormous space savings resulting in large cost reductions related to the rental of office space;
- The TW@H allows for the reduction of leased space required by Trademarks in addition to meeting GSA requirements for telecommuting; and
- TW@H helps to reduce the number of cars on the road, which has a positive impact on the environment, and saves USPTO funding with regard to transportation subsidy.

#### 1.3.1.6 Trilateral Network

##### a. Description

TriNet is a VPN that was initially set up among the Trilateral Offices as directed by the Kyoto Action Plan of November 1997. A VPN is functionally a private network established over public networks by the use of end-to-end encryption technology to protect sensitive information. In the case of TriNet, the public network is currently a Frame Relay Service provided by an international telecommunications carrier under a contract arrangement that has been established through the European Patent Offices (EPO). Data sent over TriNet is encrypted/decrypted by encryption hardware devices at the network access points. USPTO selected and deployed the encryption and intrusion detection mechanism on TriNet and operates a NMS that monitors and controls the network. Since being established with 3 members, TriNet was extended to include World Property Intellectual Organization (WIPO) as of mid-1999 and at the Spring 2001 Trilateral Meeting, the Trilateral Offices (EPO, Japan Patent Office and USPTO) agreed to expand TriNet to the Canada and Korea IPOs (CIPO and KIPO) on a pilot basis. The Japan Patent Office (JPO) is sponsoring Korea and USPTO sponsors Canada. A combination of adding new offices, upgrading to emerging VPN technology and a life-cycle replacement strategy for the original TriNet equipment led to a decision in May 01 to begin replacing the current TriNet security devices with new ones that use IPsec technology and the US approved advanced encryption standard (AES).

The present international exchange of national and PCT data between USPTO and other Intellectual Property offices still relies on the physical transfer of documents on optical or



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magnetic tape media or as paper documents. The EPO, JPO, and WIPO have begun using TriNet for network exchange of sensitive electronic documents. The WIPO, USPTO, EPO, JPO and other major intellectual property offices are in the process of converting their respective workplace environments from paper-based to electronic. At the same time, the WIPO IMPACT and WIPO Network (WIPOnet) projects are underway to automate the Patent Cooperation Treaty (PCT) Receiving Offices at the WIPO International Bureau and other PCT Offices worldwide. The electronic exchange of national patent examination and PCT data, will replace the paper exchange of several tens of thousands of documents with the potential for substantial savings in document shipping, handling, storage, and retrieval. Electronic exchange will also eliminate situations where a recipient has to re-scan documents that have already been scanned by the sender for use in the sender's internal system but were printed out as paper because data file exchange is not implemented. The ability to exchange sensitive patent information via TriNet offers enhanced flexibility in terms of having information available when it is needed and reducing the transfer of unnecessary information.

The Trilateral Offices had been providing each other remote client access to their internal search systems via costly dial-up international ISDN services since 1996. This remote search terminal access is now provided more cost effectively by the TriNet. USPTO has EPO Epoque 2 client workstations, which are connected to the Epoque system at EPO via TriNet. USPTO has deployed Web Electronic Search Tool (WEST) software to the EPO and JPO, which they have installed on normal Windows workstations to access our WEST search server via TriNet. CIPO currently accesses the PTO WEST system via the Internet. CIPO WEST access will be implemented over the TriNet once TriNet expansion to CIPO is in operation. JPO updated their F-Term search system to use Internet protocols during 2001. USPTO and EPO are now using TriNet to connect F-Term workstations in their respective offices with the F-Term servers in Japan. TriNet is used for examiner access to foreign search systems because the search patterns/strategies of examiners during the prosecution of cases is considered to be sensitive.

TriNet, using currently available access control and security technology, will readily support online access and retrieval of priority documents, search and examination reports, access to the search databases and exchange of electronic patent application data. Two methods to access sensitive documents are under study: (1) Batch transfer by a Push Mechanism based on a request to a server from an organization in the office of second filing and (2) Controlled access Pull Mechanism for use by examiners in an office of second filing or at an International Search Authority (ISA) to retrieve sensitive documents from an Intellectual Property Digital Library.

The EPO and JPO are currently using a Push Mechanism for priority document exchange between them on a weekly basis. The USPTO System Architecture and Engineering staff has developed a proposal for a Pull Mechanism for accessing sensitive data such as unpublished application files for submission to the Trilateral Partners and WIPO. The Pull Mechanism makes use of digital certificate based authentication of parties and is



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connected with work on developing a Public Key Infrastructure among the Trilateral Offices and other organizations such as WIPO.

The Trilateral Offices and WIPO are beginning to use Digital Certificates associated with Public Key Infrastructure (PKI) technology to enable E-Commerce among themselves and with their external customers. USPTO is presently issuing digital certificates for its PKI services that are used by the ePAVE client of the online Electronic Filing System (EFS). In the same time period EPO has begun issuing Digital Certificates and Smart Cards for electronic filing with their online epoline system. The Offices have committed to work for interoperability among their PKI systems as use of this technology expands. In order to achieve interoperability it will be necessary to synchronize the PKI directory and Certificate Authority (CA) servers of the offices to exchange Digital Certificate related information.

TriNet offers a secure channel for support of PKI directory and CA synchronization. TriNet services can be expanded to support key components of the USPTO's 21<sup>st</sup> Century Strategic Plan in the areas of examiner collaboration and sharing of work products. TriNet service can safeguard the exchange of sensitive information between examiners and provide protection for work processes that are considered sensitive such as a U.S. examiner accessing unpublished case data in the electronic examination process at another office and access to allow sharing of search information before publication. As plans for collaboration and sharing of work products develop, means to ensure strong authentication of identities will be needed. TriNet offers a protected mechanism to interconnect the PKI systems of member offices allowing them to exchange data needed to enable interoperability of the PKI systems as part of a solution for providing strong authentication.

#### **b. Commitments and Benefits**

This project supports the USPTO Macro performance goals of: (1) expanding intellectual property rights systems abroad; (2) promoting awareness of, and providing effective access to, patent and trademark information; and (3) advancing the DOC and USPTO critical goal of exercising leadership in the development of a Global Intellectual Property Network. Operating the TriNet provides benefits to the USPTO and other intellectual property offices and their customers by way of:

- **Data Protection**: TriNet protects sensitive data exchange between offices and conceals the nature of sensitive transactions;
- **Efficient Processing**: Electronic transfer of Intellectual Property information will provide for direct online exchange among Trilateral and WIPO PCT office automation systems without having to exchange voluminous paper documents and eliminate the costs of redundant scanning operations. The ability to transfer data when it is ready, such as electronic patent applications, will reduce the time delay



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inherent in waiting to accumulate sufficient materials to exchange on a batch basis. The on-line exchange via the TriNet also provides up-to-date patent information to each partner office for examining purposes;

- **Improved Database Access**: TriNet has replaced expensive dial-up commercial connections between Offices for access of internal search systems. The security measures that are implemented for external access to databases through TriNet are superior to previous measures from dial-up access and provide improved security and resistance to inappropriate use. Instead of sending priority data where the bulk of it is never referenced, examiners will be able to access the specific documents they need when they need them (Pull Mechanism);
- **Standards for WIPO's WIPOnet project**: TriNet serves as a model vehicle to guide the development of technical standards to govern electronic communications among the International Bureau and WIPO member states;
- **Increase in Intellectual Property Protection**: By providing the Trilateral Offices and WIPO with timely access to the work products of the major offices, the quality of intellectual property protection in those systems will improve;
- **Remote Access**: TriNet supports remote access to internal search systems of partner offices and on-line exchange of electronic priority documents;
- **Secure Connections**: TriNet provides secure connections that can support sharing of work products by examiners, access to file inspection and dossiers/file wrappers, and interconnection of PKI servers in a cross-certified PKI environment;
- **Prevent Intrusions**: TriNet guards internal office systems from hacking or inappropriate use by external or internal users; and
- **Leadership Role**: TriNet affords USPTO a leadership role in establishing security policies and practices. This system also advances USPTO mission as a world-leader in the IPO community.

### 1.3.2 Core Network

To maximize its investment in infrastructure technology, USPTO has established the Core Network and Infrastructure System that provides enterprise-wide services. These services are provided by shared resource organizations and components that evolve the IT infrastructure, operate and maintain production systems, provide communication networks, manage and support desktop hardware/software and provide customer support, acquire IT products and services, ensure quality systems are deployed, and define, access,



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and archive data. The resulting IT product and service infrastructure supports the entire USPTO.

One primary objective of this investment is to operate and maintain the computer facilities, hardware, software, and telecommunications capabilities deployed in support of the USPTO business processes. The in-house staff will be augmented as necessary by contractors to provide the full range of services required across the various hardware and software platforms in use.

Another objective associated with this project is to improve the services provided so that customers have timely, reliable, innovative, and cost-effective access to USPTO IT when and where they need it. An additional objective is to reduce costs so that the increasing number of customer IT requirements may be met. The achievement of these objectives will enable the staff to better meet and exceed customer commitments and established service level agreements.

The Core Network and Infrastructure System also provide IT product assurance automation tools to support performing and managing testing, configuration management, and requirements management. Enterprise data management is also supported by providing components to support USPTO decision making and operations include an enterprise data model, standard data elements, an information repository, a data quality improvement and monitoring function, a data stewardship project, development and implementation of a common data dictionary for international patent use, management of Standard Generalized Markup Language (SGML)/eXensible Markup Language (XML) assets through the repository, and support for Unified Modeling Language (UML).

The PTO Network and Infrastructure System provide a broad range of capabilities. The entire suite aims to provide costs efficiencies by providing standard services and tools to the enterprise. One major capability provided is the PTONet, which is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Upgrades to this integrated network enable the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, and migrate systems to operate on an evolving infrastructure. Ongoing investments in the network component of this system are currently yielding the following benefits to the PTONet user:

- **Greater network capacity**: The network was upgraded in 2001 and 2002 to replace discontinued equipment and to provide additional bandwidth. This expanded bandwidth will be in direct support of the business requirements of a fully electronic workplace;



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- **Improved accessibility**: The redundant connectivity provided throughout the network by the Alternate Routed Buildings efforts will ensure that the network will continue to provide service despite construction-related traumatic failures;
- **Support enhanced business functionality**: The PTONet client computer connections were upgraded to switched 100 Mbps, which has laid the groundwork for enhanced business functionality; and
- **Industry standard interface**: A Gigabit Ethernet backbone brought PTONet into a leading position with industry-standard networking, making connections easier and more straightforward to engineer. In business terms, this means the USPTO shares a common network topology and technology with industry sectors' networks, making interconnection and access, when necessary, possible. The advantage to the business user is the greater availability of data.

### 1.3.2.1 Data Load and Maintenance

#### a. Description

The Data Load and Maintenance staff is responsible for all text and image data load processes and maintenance of both domestic and foreign patent and trademark data. The staff performs the data loading and maintenance of both text and image data for the following databases: Patent Weekly Issue Data Load, Patent Images on the Web (PIW), Pre-Grant Patent Application Weekly Issue Data Load, Application Images on the Web (AIW), Trademark Application Data Load, Trademark Registration Data Load, Global Patent First Page Information Data Load, Science Server, Elsevier Data Load, Foreign Image Data Load, Computer Search Support, CD-Rom Reference Library System (CRLS) Update, Pre-Exam "Pre-grant Publication" Support XML Tape Cutting Process, Electronic Filing System (EFS) "Pre-grant Publication" Tape Cutting Process, Query By Example (QBE) Keyword Database Weekly Update, Digital Linear Tape (DLT) Patent Grant Front-File Tape Creating Process, and DLT Pre-Grant Front-File Tape Creating Process.

The Data Maintenance Staff provides technical support for the loading and maintaining of all text and image data; provides data validation and error corrections to ensure quality and accuracy of all loaded image and other ongoing projects; ensures completeness of text and image data bases by conducting data analysis and creates statistical reports of patent and trademark image data flow. The Data Maintenance staff is also responsible for generating and maintaining all AIS backups to ensure the recovery of data during the time of a disaster.

In addition, the data load and maintenance personnel validate loaded (Pre-Grant Publication (PG-Pubs) Data and the scanning and cropping of trademark registrations.



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The data loading is performed on a weekly basis to the USPTO databases aforementioned, including the loading of non-patent literature.

A key component of the data load and maintenance is the requirement to automate the numerous loads assigned to the Data Maintenance Branch for processing. This project is to automate loading so that USPTO can successfully secure the new Carlyle site and make use of currently available technology (i.e. File Transfer Protocol – FTP) that will allow loading of the various database updates through automation rather than manual processing of a magnetic tape or CD. This aspect of data loading and maintenance is an integral aspect to the security posture of the new Carlyle Data Center.

#### **b. Commitments and Benefits**

Data Load and Maintenance is an IT infrastructure function that supports the Patent and Trademark business areas. Data Load and Maintenance enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored lifecycle management process. In addition to meeting these customer commitments, Data Load and Maintenance will provide benefits to customers and staff alike as follows:

- Improving the quality, accuracy, and completeness of both the text and image data bases;
- Extensive validation and error detection/correction of text and image data to ensure and maintain document quality assurance/validation standards, thereby providing the best available document for the users/customers;
- Create and maintain tape backups for all AIS data projects; and
- Adherence to all product and service conditions contained in pertinent Service Level Agreements (SLA), as coordinated with those offices within the USPTO that subscribe to the SLA program.

#### **1.3.2.2 Data Services – Boyers**

##### **a. Description**

The staff in the Boyers, Pennsylvania facility provides IT products and services that support all USPTO employees and business areas. This staff provides high volume tape dissemination to private sector customers, scans and prepares trademark registrations, archives all issued patents and trademarks, and maintains microfiche/microfilm files used by the USPTO.



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The operation and maintenance of the Boyers data center is critical to providing customers with timely, accurate, and up-to-date business information, including backup support for preparing the congressionally mandated weekly load of issued patents and trademarks. The Boyers facility provides a means for the USPTO businesses to share resources and services, enabling the support of an increasing number of customer requirements. The facility also provides a means for the USPTO to recover critical business information in the event of a disaster.

The Data Services staff is responsible for operating, monitoring, and problem reporting/resolution activities associated with site operations. The staff also is responsible for site system software support and facilities management. System software support includes installing, configuring, managing, and maintaining all system software and database management software. Facilities Management support includes preparing the site for the installation of new equipment, de-installing and accessing equipment that is no longer required, and managing and monitoring the data center environment and facility security.

The USPTO has begun the acquisition and implementation of a full inventory of document handling equipment for the Boyers facility. This equipment provides environmentally sound storage, in rotating bins, for all of the US Patent "A" set of patents (archived paper copies of all patents issued) and makes them retrievable through the use of a PC-based indexing system that will deliver the desired patent to the operator sitting at the built-in workstation on the device. It is estimated that USPTO will require 60 – 65 of these document-handling systems in order to store the approximately 6.5 million patents now archived. There are currently 59 of these devices resident in the Boyers facility. An additional 8 document handling systems will be acquired in FY 2002. Of these 8 devices, 5 will be used for the storage of archived (backfile) patents and 3 will be used to store newly issued patents. It is expected that additional devices be required in the FY 2003 and out-year procurement cycles, not only to service the newly issued patents, but also to complete the storage of archived patents. The number of devices required to fully service the storage of the archived patents has increased due to the increasing number of patents being issued each week.

#### **b. Commitments and Benefits**

Data Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Data Services enables the USPTO to maintain current business production and improve and enhance current business and IT infrastructure. In addition to meeting these customer commitments, Data Services will provide benefits to customers and staff alike by using the following technologies and management approaches:



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- The use of document handling robotics extends the shelf life of the patents significantly by placing these documents in sealed equipment thereby removing the documents from the effects of the outside environment;
- Further use of document handling robotics enables the faster retrieval of patents for copying and rescanning;
- Use of document handling robotics provides a much safer work environment by removing the current shelf storage system whereby an operator must climb a ladder to a height up to 13 feet to retrieve a box of patents and, eliminating the need to return the box to the shelf;
- Adherence to agreed-upon schedules for the preparation of magnetic media for the tape dissemination efforts; and
- Backup capability to prepare the Weekly Issue Patent Image database, and update of magnetic tapes in time for them to be loaded to the database maintained in Arlington, Virginia by the mandated time of 5:30 each Tuesday morning. This backup capability is activated whenever the contractor-provided weekly issue input tapes are either not available in time to complete the loading by Tuesday morning, or the tapes are in error in some way.

#### 1.3.2.3 Data Storage Online Magnetic

##### a. Description

This project provides prototype, pilot, and deployment of storage technologies for USPTO. The on line data storage includes developing procedures and deploying software for managing storage. EMC Control Center is being deployed in FY 2003, and will be operated and maintained thereafter. Technologies include Storage Area Networks (SAN), Network Attached Storage (NAS), Nearline storage, storage consolidation, storage management, and storage on demand.

##### b. Commitments and Benefits

This effort delivers to the customer and staff high availability storage and consolidated storage. Data stored on line also optimizes storage allocations and utilizations. This process enables effective management of storage through software systems and storage on demand. In addition to the meeting commitments to customers and staff, the benefits include high availability, scalable storage technologies to support the storage of all business critical information at USPTO. The data is also consolidated to optimize storage utilization.



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#### **1.3.2.4 Enterprise Server and Storage Consolidation**

##### **a. Description**

This project will optimize the utilization of any new or replacement servers and data storage to consolidate the number of servers & storage by leveraging current technology. This effort will enable USPTO to leverage its resources better as well as prepare USPTO for the move of Data Center to Carlyle & better prepare for Disaster Recovery.

##### **b. Commitments and Benefits**

This project meets commitment to customers and staff by providing Optimal server & storage utilization & scalability, "storage & processing" on demand based on more timely/actual needs, reduction of overall maintenance & support cost, and Facilitation of the setup/engineering of disaster recovery site. In addition, key benefits include (1) optimal use of resources; (2) ability to rapidly meet changing business needs; (3) reduction of overall costs; (4) better preparation for natural and system related disasters.

#### **1.3.2.5 File Transfer Protocol/Virtual Private Network**

##### **a. Description**

This project is an on-going effort to complete the eGov/ePatent requirements. The goal of this project is to continue the on-going design of the circuit network that can provide and warrant the bandwidth availability to accommodate bulk file transfer of grant and pre-grant products, IFW files and IFW application remote access among USPTO, RTIS Bailey's Crossroads VA, RTIS Horsham PA, USPTO Warehouse at Springfield VA. and the Boyers PA facility. . In addition, this project is to fully integrate into the IFW network environment by implementing a secure access network that electronically transfers large size patent application data, IFW data, Pre-Grant Publication products, and Patent Grant Publication products between these locations.

As the Art Units are IFW-enabled, PUBS becomes more reliant on access to IFW. It is critical that the current system access (PALM EXPO, Pre-Exam, EFS, ABSS, PACR, and Intranet) be maintained, but moved to the T3 for additional security and faster access speed, and for real-time access to IFW network. The Horsham, PA T-3 circuit will be used for the export of IFW files to RTIS-Horsham, receive deliverables from RTIS-Horsham, receive updates to PALM on IFW files that have completed initial data capture, final data capture, and pre-grant publication, and obtain real-time access to IFW and PALM EXPO, Pre-Exam, and Intranet files throughout different stages of the grant and pre-grant processes. The real-time access would facilitate the timeliness of the verification of data exports, query resolution, ability to work on PTO actions, and the update of IFW, PALM, and Pre-Exam data as well as provide another backup for the export module. The real-time access to IFW will prevent the PTO from having to



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implement manual workarounds.

Presently, IFW applications make up only 3.4% of all cases processed. By the end of the 120-day period of Interim Operating Authority, approximately 25% of all applications processed in post-allowance will be IFW applications. This means by the end of that period the PTO will not only have 25% of the issuing patents delayed by over three weeks (2,600 fewer issued patents), but the extra resources utilized in processing those applications will likewise cause the non-IFW applications to be delayed significantly past the current time interval of 61 days. The PTO could be looking at the total of non-issued patents being two to three times the estimated 2600 IFW applications.

#### **b. Commitments and Benefits**

This activity is meeting commitments to customers and staff alike by providing for the automatic, electronic delivery of IFW data, patent application data to the publication database contractor and receiving IFW data, Pre-Grant products and Patent Grant products. In addition, the benefits of the FTP/VPN are described below:

- USPTO will no longer rely on the aforementioned media and physical file wrappers for file transfers between the USPTO, RTIS Baileys, RTIS Horsham, Springfield warehouse, and Boyers;
- USPTO will be able to transfer the IFW data and patent application data the same day that allows RTIS more days to increase the volume of Pre-Grant Publications and Patent Grants, with minimal manual intervention from staff/contractors supporting IFW, Patent Application Capture and Review (PACR) System, Patent Application Location and Monitoring System (PALM), ABSS, and EFS;
- With the same day validation and feedback of patent application data, Pre-Grant and Patent Products, from RTIS, the USPTO will have the ability to transfer replacement data the same day that it is ready;
- USPTO will be able to validate the products with more lead-time before the publication dates. RTIS will have the ability to transfer replacement products the same day that they are ready;
- Daily use of couriers and vehicles between the USPTO, RTIS, and Boyers for delivery of physical file wrappers and media containing patent application data, Pre-Grant products, and Patent Grant products will be eliminated, improving daily electronic business transactions;
- Boyers will be able create dissemination tape masters and backups from the Pre-Grant and Patent Grant products downloaded from the Bonham server; and



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- The increase in lead-time for producing DLTs and CD-ROMs of Pre-Grant products and Patent products will improve delivery time to the product subscribers.
- Verification of Exports - access IFW and PALM EXPO, Pre-Exam and Intranet files to perform a completeness check of the applications and print out/download missing or corrupted images;
- Print applications and follow-on papers in the event that the export capability is unavailable;
- Resolve Queries - send and receive messages from PUBS (PUBSPrinterRush, PUBSPGPubQD, PUBSIDC, and PUBSFDC), correct data and soft scan printer rush queries/corrections into IFW, download corrections made by the PTO;
- Work on Actions - access IFW mailboxes (PUBSPrinterRush, PUBSPGPubQD, PUBSIDC, and PUBSFDC) to receive and send messages about application files for which PTO has requested actions be taken or request that the PTO takes certain actions on application files in the grant/publication cycle; and
- Update data using PALM EXPO and Pre-Exam on application files in the grant/pre-grant publication cycle.

If data transfer requirements and real-time access to IFW, PALM EXPO, Pre-Exam, and Intranet Systems is not provided/maintained, then PUBS faces significant delays in data transfer, data capture, and data reconciliation. The delays currently experienced have already had a direct impact on the grant issue and pre-grant publication files exported to RTIS. Grant files transferred to RTIS have declined from 3800 files to 3100 files per week. Pre-Grant files transferred to RTIS have declined from 4700 files to 4000 files. Using a conservative estimate, Grant files may decline to 2600 files per week and Pre-Grant files may decline to 3500 files per week.

The consequences of the delays PUBS is now facing with the manual work-around because of the present status of IFW is as follows:

Average time from issue fee payment to issue for all applications -	61 days
Average time from issue fee payment to issue for IFW applications -	85 days

### 1.3.2.6 Facilities Management

#### a. Description

The Facilities Management staff maintains the Arlington, Virginia data center, which provides IT products and services to all USPTO employees and business areas. The



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USPTO's application and database servers, data storage systems, and other IT infrastructure components housed in the data center require facilities with the appropriate structural, environmental, and security conditions.

Customers desire and require timely access to information and tools when these resources are needed. The specialized facilities management expertise required to ensure the secure, continuous operation of the infrastructure is critical to providing the required access as well as performing the USPTO business processes.

The Facilities Management staff prepares the data center for the installation of new equipment, which can include activities such as enhancing the structural foundation, and providing increased power, cooling, or other environmental conditions necessary to keep the equipment consistently in operation. The staff de-installs and excesses equipment that is no longer required, and provides technical expertise in the design and installation of new equipment and systems. The staff also manages and monitors the data center environment, which includes specialized facility security.

Recent enhancements include the installation of new data storage equipment, automated tape libraries, numerous application development servers, and a secure power feed to the center itself. The most significant enhancement to the facility has been the installation of a second, redundant electrical power support feed that will ensure uninterrupted electrical support in the event of power outages. The Facilities Management staff is involved in the maintenance of the data center facilities, ranging from security equipment maintenance to off-site storage for backup tapes.

#### **b. Commitments and Benefits**

Facilities Management is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Facilities Management enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, and migrate AISs to operate on an evolving infrastructure. In addition to meeting these customer commitments, Facilities Management will provide benefits to customers and staff alike as described below:

- Employing the in-house Facilities staff to install electrical support for all new equipment, thereby enabling the installation of equipment in the shortest time possible;
- Maintaining the appropriate environmental controls such that the installed equipment is subject to only heat and humidity as specified in the manufacturer's documentation as well as maintaining pertinent heat and humidity levels for human occupancy; and



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- Maintaining air quality through the use of air quality studies, thereby providing the best possible environment for the operations and networking staff.

### 1.3.2.7 Infrastructure Hardware Management

#### a. Description

Support is required to augment Government staff for managing the evolution of the USPTO IT infrastructure. Tasks include storage device management, storage management software evaluation and upgrade implementation, technology refresh evaluation of server products, and clustering/consolidation design. In addition, this activity will convert Boyers operations to DLT tape format using the Yellow Book II standard. IBM 3480/3490 is an obsolete tape media, and needs to be upgraded to higher density and better performance. Mainframe at Boyers will also be replaced.

#### b. Commitments and Benefits

The management of infrastructure hardware will establish standardized means for timely and reliable backup of critical data, thereby improving reliability and performance of backups and recovery procedures. Synchronized backup can be performed across multiple servers. Hot backup capability (back up run while business applications are still running) will also be available. In addition, the benefits of this project are as follows:

- Lower amount of potential data loss;
- Faster recovery and less down time of mainframe servers;
- Improved ability to control operations and maintenance costs (e.g. Lowering cost per Terabyte.);
- Provide/improve business continuance capabilities in the event of disasters;
- Lower operations and maintenance cost of tape backups;
- Support server recovery in the event of a server failure; and
- Support data restoration in the event of data corruption, hardware failure, or human error.

### 1.3.2.8 Network Management Systems

#### a. Description



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The USPTO requires a high performance, flexible, reliable network infrastructure to support a large number of mission-critical business and office automation applications. Network Management Systems (NMS) performs day-to-day operational management of the USPTO network (PTONet) infrastructure, which extends to more than 8,400 PTONet users and thousands of network devices located throughout multiple buildings on the Arlington, Virginia campus. In addition, Network Management manages and monitors connectivity to remote sites, including Trademark Work at Home systems, Public Search Room/Universal Workstation (UPWS), Automated Biotech Sequence Search System (ABSS), Mail@Home, FAX, and Patent Work@Home projects.

The NMS ensures that PTONet infrastructure is operating at optimum levels and restores PTONet to acceptable services when an outage occurs or when degraded performance levels are detected. This includes operation of the ATM core backbone, building infrastructure and closet devices. Network Management provides network and automated information server connectivity and operates wide area network (WAN) external connections to remote sites. Network Management operates and maintains the network to ensure that all desktop workstations, servers, and other computer devices communicate with each other in proper fashion.

Network Management Systems performs centralized monitoring of PTONet infrastructure and file servers using the Enterprise Management System. The Network Operations Center (NOC) provides 24 hour a day, 7 day a week monitoring of PTONet. Such monitoring allows network personnel to quickly trouble shoot problems and restore service. In many cases outages are prevented before they occur.

NMS performs preventative maintenance on all network infrastructures devices. PM ensures all configurations are correct and baselined, all hardware is operational, and that "hot-spare" hardware is ready to assume operations should the primary hardware fail. Preventive Maintenance activities have significantly increased the reliability of the network infrastructure.

NMS works with users, network engineers, and system developers to maintain an accurate picture of the network. Network Management coordinates the infusion of new technology into the PTONet operating environment. Network Management maintains accurate configuration records of all facets of PTONet. This increases up time dramatically. Keeping the system uniform throughout allows for easier troubleshooting. Examples of configuration management include maintaining network diagrams and ensuring all components are configured identically (baselined), and ensuring they are registered in the USPTO's inventory system

Network Management performs performance management of PTONet. This task allows network personnel to tell how well the network is operating. The network tracking is accomplished through the generation of activity reports on all system outages, real time performance analysis (current network performance), and trend analysis (network



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performance over longer periods of time). Network Management also performs capacity management of PTONet. As network connectivity requirements are introduced, Network Management ensures the additional network interfaces are available to connect both new users and new servers to PTONet.

In addition, Network Management performs many enhancements to PTONet. This includes support during the infusion of new technology into the PTONet operating environment, assessing new operational requirements, architecting the best solution for integration into the existing environment, and providing operational technical support to various USPTO business area, corporate, and infrastructure projects. Network Management also performs upgrades and enhancements to PTONet infrastructure. Coordination with Office of Systems Architecture and Engineering (OSAE) is performed when this occurs.

#### **b. Commitments and Benefits**

Network Management Systems is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Network Management enables the USPTO to maintain current business production and enhance current business and IT infrastructure and migrate AISs to operate on an evolving infrastructure.

Network Management Systems will provide benefits to customers and staff alike as follows:

- Adherence to all product and service conditions contained in pertinent Service Level Agreements, as coordinated with those offices within the USPTO that subscribe to the program;
- Extensive monitoring and error detection/correction of failed or failing components that might jeopardize system stability during production hours; and
- Performance of Detailed Standard Operating Procedures (SOPs) to optimize operational capability and system performance, and to maximize system availability.

#### **1.3.2.9 Operating System Support**

##### **a. Description**

The USPTO's use of mainframe computers, servers, data storage systems, workstations, and other IT requires specialized technical expertise to install, configure, manage, and maintain all operating system software on a 24 hour, 7 day basis to ensure the availability of needed applications to customers. Expertise is also required to install, configure,



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manage, and maintain all related system software required to operate the infrastructure components, as well as software development tools installed on the various computers.

The Operating System Support staff is responsible for providing technical expertise to system developers, troubleshooting and resolving operating system and related software problems, engineering and integrating operational procedures, establishing policies for all types of systems, writing complex system software utilities and operating system patches to enhance vendor-provided features, and evaluating the feasibility of new/upgraded operating systems. These services encompass the newer generations of infrastructure as well as the current legacy systems. The staff is also responsible to work with the System Performance Measurement Division in reviewing the performance data collected by that group to determine improvements to system quality, availability, and performance so that customers have consistent, timely access to the necessary business tools and information.

### **b. Commitments and Benefits**

Operating System Support is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Operating System Support enables the USPTO to maintain current business production, enhance current business and IT infrastructure, migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored LCM process. In addition to meeting these customer commitments, Operating System Support will provide benefits to customers and staff alike by performing the following responsibilities:

- Supporting business customer requirements for high availability of servers running business applications;
- Ensuring that operating systems and servers that host business applications run at maximum efficiency;
- Ensuring availability of system administrator(s) to restore application servers to operational readiness after software and/or hardware failures;
- Complying to all product and service conditions contained in pertinent Service Level Agreements, as coordinated with those offices within the USPTO that subscribe to the program;
- Monitoring, detecting, and correcting error of failed or failing components that might jeopardize system stability during production hours; and
- Support of all infrastructure upgrades, hardware and software, and execution of the integration of these efforts into production.



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### 1.3.2.10 Operational Support – Supplies

#### a. Description

As more and more internal and external transactions are performed electronically, the operational support of the IT infrastructure becomes critically important to performing the mission.

The Operational Support staff is responsible for the daily inspection and maintenance of all critical production systems and equipment, ensuring adequate supply of printer toners, bar code labels, bar code printer ribbons, and other assorted materials required to meet the production demands of customers.

#### b. Commitments and Benefits

Operational Support is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Operational support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure and migrate AISs to operate on an evolving infrastructure. In addition to meeting these customer commitments, Operational Support will provide benefits to customers and staff alike as described below:

- Adherence to all product and service conditions contained in pertinent SLA, as coordinated with those offices within the USPTO that subscribe to the SLA program and
- Extensive monitoring and error detection/correction of failed or failing components that might jeopardize system stability during production hours.

### 1.3.2.11 Other Peripheral Devices/Upgrades

#### a. Description

Currently, this project supports deployment, testing, and maintenance of Radios used throughout the USPTO campus.

#### b. Commitments and Benefits

The commitment to the customer and staff is being met by offering alternate communication means that is reliable, and this activity will enable more responsiveness in maintaining and troubleshooting the radios.



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#### **1.3.2.12 USPTO Hardware Standardization**

##### **a. Description**

This project is to evaluate, test, and maintain all USPTO approved list of hardware (desktop, laptop, handheld hardware, and peripherals including printers, scanners, etc.) to optimally leverage current technology to meet USPTO customer office automation requirements while reducing overall cost. Helpdesk support is also provided.

##### **b. Commitments and Benefits**

The commitment to customers and staff are being met by improving adaptation of new technology to increase reliability and performance of USPTO hardware. This effort provides the necessary testing, documentation, and support regarding all USPTO hardware (including Section 508 testing). The number of hardware to support and maintain are also being minimized. The benefits derived from the PTONet hardware standardization is that user productivity will be improved, and reduces the overall maintenance/support costs associated with PTONet.

#### **1.3.2.13 PTONet**

##### **a. Description**

The general term for the entire collective USPTO network is PTONet. The implementation of new applications or systems such as the Trademark Electronic Application Submission, Trademark Information System/Madrid Protocol, Image File Wrapper, and Global Patents requires continuous enhancements to PTONet to ensure customer satisfaction in an IT environment in which most internal and external transactions are performed electronically. Implementing electronic commerce to improve USPTO business operations requires continual enhancement to PTONet. The enhancements are needed to address increasing transactions and growing databases as well as continued reliance on the Internet to conduct business with customers and partners.

Activities include planned technology reviews, with associated upgrade and replacement of IT infrastructure components. PTONet follow-on projects will coordinate required infrastructure component changes with the Space Consolidation Project to provide a cost efficient and effective means of upgrading and replacing components. As the move is being accomplished and personnel are relocated, the existing PTONet will be deactivated after the last user has relocated.

The original switches that comprised PTONet were installed in 1996 and 1997. They had an expected five-year lifecycle and they were replaced in FY 2001 and FY 2002. The next scheduled timeframe for replacement is FY 2007. The activities that comprised the



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network replacement effort included a market survey of technology and available equipment, determination of what services and components will be needed, procurement of hardware and software, systems engineering and integration, building upgrades and deployment of new equipment, and testing.

#### **b. Commitments and Benefits**

The current PTONet enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, and provides a means to migrate AISs to operate on an evolving infrastructure.

In addition to meeting key customer commitments, the continued enhancement of PTONet will provide benefits to customers and staff alike through following capabilities:

- **Greater Bandwidth**: PTONet's GE backbone allows the adoption of new subsystems without the concern of having to provide the necessary bandwidth on a network segment basis. The increase in available user bandwidth results in faster network response times for image search and retrieval and other network uses, which translates to greater productivity and effectiveness;
- **Adoption of an Industry Standard Network Topology**: The GE backbone and GE-compliant layer 3 riser switch topology that comprises PTONet allows the USPTO to readily upgrade the network to accommodate workload growth and improve customer service. Future PTONet upgrades may include other industry standard network topologies. The layer 2 closet switch topology may be changed to layer 3 closet switches to provide more granular Quality of Service;
- **Faster Access to Data**: New technology will continue to evolve and enable users to have faster access to more timely data, which will trigger demands to increase the use of IT to help manage programs and provide new services. One trend is USPTO's greater reliance upon network communications to access both internal and external databases through PTONet; and
- **Greater Reliability**: It is essential that continuing enhancement activities are accomplished to support customer requirements, improve the reliability, maintainability, and availability of network resources and to achieve the level of operational integrity required to support the needs and expectations of the USPTO user community. Also important is the ability to provide the necessary level of security and enable the rapid infusion of new technology to meet the constantly growing demands of the USPTO workforce. With the rapid change in IT expected in the future, planned reviews and upgrade/replacement of infrastructure components enable continuous business operations, business benefits through the incorporation of newer technologies, and cost effective component maintenance and operations.



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One other benefit of the current network is flexibility: it is now possible to make the network accommodate the transfer of legacy equipment during examiner personnel moves such as creation of industry sectors and consolidation of offices. The network can provide the same addressing in separate parts of the USPTO campus while the phased move of legacy equipment takes place during production hours, resulting in savings of time and effort in move-related activities.

#### **1.3.2.14 Patent Examiners Network Attached Storage Service and Backup**

##### **a. Description**

The network-attached storage is provided to all patent examiners to enable them to electronically store all critical documents and files. The network storage is backed up and is configured to be available in supporting the daily backups of data from the Patents Business Area.

##### **b. Commitments and Benefits**

The network storage for Patents Business Area meets the commitments to the customers and staff by making available current technologies in data storage for saving large volumes information. For example, the network storage includes (1) 1.18TB network-attached storage space; (2) Backup hardware and software for daily backup of data; (3) High availability and scalable storage capabilities; and (4) Home Directory storage that has been increased from 50Mb to at least 1Gb. In addition, the benefits of the NAS service and backup enables (1) the examiners to store important files and documents on a facility which is backed up on a regular basis and (2) increase in use of electronic storage of critical documents as file storage limits are set to a level that encourages frequent usage.

#### **1.3.2.15 Performance Monitoring and Capacity Planning**

##### **a. Description**

This effort will help to measure, analyze, and make recommendations on current performance issues in current and future applications servicing the USPTO Business Areas. The goal is to bridge the gap between business metrics and system performance metrics in solving real business performance problems. Services include Monthly AIS Executive report, SPMD web page containing application, operating system metrics, system problem determination, AIS performance problem determination, availability metrics, Application Disk space usage and growth, Work at Home VPN problem determination, usage and growth, and Network usage and growth.



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#### **b. Commitments and Benefits**

This activity will provide improved performance of AIS systems. System Performance Management Division (SPMD's) expertise in correlating causality with performance problems to recommend corrective action while minimizing investment in capital. Critical performance metrics used by SIRA are collected and tracked. Also, there will be improved response time to outages of AIS systems with the development of SiteScope monitors for critical AIS systems. Networking infrastructure will be provided with resource requirements for new facility, network growth rates for Internet usage from customers as well as internal PTO users. System modeling of existing AIS systems will be incorporated to design and purchase correct equipment to solve future growth needs and meet response time goals of the application. Additional capabilities that will meet commitments to customers and staff are as follows:

- Provides AIS availability monitoring and performance measurement;
- Offers Network statistics to forecast needs for current AIS needs;
- Provides DSL/VPN usage and problem determination statistics with Adlex product;
- Provide modeling services to model AIS systems and perform what if analysis on new application demands;
- Provides AETS with current growth rates of disk capacity with relationship AIS systems. Integration to EMC Control center for physical assignment to systems will be added in 03 – 04; and
- Offers expertise in I/O performance tuning.

The benefits of the Performance Monitoring and Capacity Planning are described below:

- Improvements to Patent Examiner Computer Search Support (CSS) system to meet response time metrics for workload examiners will be employed. Search and Information Resources Administration (SIRA) depends on performance metrics to ensure that the service goals to the examiners are being met;
- Institution of SiteScope monitoring for critical AIS systems have resulted in improved availability and improved reaction to outages by providing a real time interface, for helpdesk and all SDM's; and
- Growth rates of network are important for any new facility planning. The phenomenal growth rate of our network link to USPTO Internet Service Provider



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(ISP) has been upgraded in a timely fashion to anticipate user workload while not expending funds prior to their need.

Analytic modeling will be conducted for systems due for replacement or growth rates that dictate an engineering change. These models enable growth through existing workload of systems like TESS to determine what hardware is required to meet service goals of the customer;

- Synthetic monitors will be available for AIS systems for end-to-end user experiences. This includes providing availability and performance metrics based on these key business transactions. Reporting is currently distributed by the AIS Executive report published monthly;
- Current workload growth on Internet and Work-At-Home projects have increased our need to be vigilant on monitoring PTO's access to the Internet as well as the access to USPTO worldwide. Network engineering has been provided with historical and trend information to plan physical network upgrades with our ISP and our SETA contractors;
- Currently SPMD provides services to the NOC and the helpdesk to perform performance problem decomposition. SPMD has the tools to determine if a problem exists on an individual DSL line, the ISP provider or performance problems exist on the whole VPN;
- SPMD provides what if analysis on existing AIS based on new system load requirements. USPTO can determine if a AIS will need one or more components upgraded to meet new service boundaries;
- SPMD provides logical volume growth rates of UNIX servers which house a majority of the EMC storage. Growth rates are monitored on individual logical volumes, which can help AETS in determining future disk space capacity requirements for the future; and
- SPMD has experience tuning I/O subsystems to optimally perform for the individual AIS system. The I/O tuning introduced to support existing AISs has made the difference between a successful implementation of an AIS and a failure.

### 1.3.2.16 Servers/NT

#### a. Description

The USPTO provides hardware maintenance for NT servers that are not part of established AISs. These servers support infrastructure systems such as IT Facilities Management System (ITFMS), Crystal Reports, and other functions. The Servers/NT



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project enables maintenance of these servers on a 24 hour, 7 day basis to ensure the availability of needed applications to customers.

#### **b. Commitments and Benefits**

NT Server support is an IT infrastructure function that supports an important business functions that use infrastructure systems. Operational support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure and migrate AISs to operate on an evolving infrastructure. In addition to meeting these customer commitments, Operational Support will provide benefits to customers and staff alike as follows:

- Adherence to all product and service conditions contained in pertinent SLA, as coordinated with those offices within the USPTO that subscribe to the SLA program and
- Extensive monitoring and error detection/correction of failed or failing components that might jeopardize system stability during production hours.

#### **1.3.2.17 Servers/UNIX**

##### **a. Description**

The USPTO provides hardware maintenance for UNIX servers used in infrastructure efforts, not to be confused with UNIX AIS servers. Servers in the ETC Lab and servers used for development efforts are also included. The Servers/UNIX activity enables maintenance of these servers on a 24 hour, 7 day basis to ensure the availability of needed applications to customers.

##### **b. Commitments and Benefits**

UNIX Server support is an IT infrastructure function that supports critical infrastructure development needs. Operational support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure and migrate AISs to operate on an evolving infrastructure. In addition to meeting these customer commitments, Operational Support will provide benefits to customers and staff alike through the following activities:

- Adherence to all product and service conditions contained in pertinent Service Level Agreements (SLA), as coordinated with those offices within the USPTO that subscribe to the SLA program; and
- Extensive monitoring and error detection/correction of failed or failing components that might jeopardize system stability during production hours.



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#### 1.3.2.18 USPTO Enterprise Architecture Directory Services

##### a. Description

The purpose for implementing the PTO Enterprise Directory Services (EDS) is to assist the USPTO with achieving IT strategic objectives. The IT strategic objectives include single structured location to provide multiple data sources such as reduced “sign-on”, PKI, and an integrated network operating system (NOS) infrastructure. The EDS provides the logical data infrastructure critical to achieving the objectives. PKI implementation commonly focuses on the certificate authority and treats the PKI certificates as being useless without the ability to distribute and integrate the certificates into system access controls. The EDS enables PKI to meet its business objective by distributing PKI credentials to applications and systems. The initial implementation objectives, development of requirements, and creation of an active directory concept of operations, engineering integration with other PTO directories, and integration with PKI, are achieved through development of an extensible AD directory information tree (DIT), creation of a structured AD namespace, and implementation of a demonstrable capability.

##### b. Commitments and Benefits

The commitments to staff and customers are being met by the development of Directory Information Tree with Schema. The capabilities of the UEA Directory Services includes Pilot Implementation, Role Based Access Control Structure, Integration with SSO, Deployment into Production environment, Guidebooks for Utilizing Enterprise Directory Services, and Full Implementation. The benefits of the Directory Services are as follows:

- Essential services are provided for the IFW Project (Gaining access controls, credential management, interface management, enterprise consistency);
- Compatibility is established with other directory services and meta directories with recognized standard methods to Gain Access to Organizational Data;
- Cost savings in hardware support (installation time and helpdesk), reduction in administrative costs, and effective management of user accounts are being achieved;
- Interoperability, higher availability, and scalability reduces down time and associated costs for application migrations;
- Security of data and access controls are enhanced, and user access to resources across operating systems with Single Sign-On offers rapid retrieval of information;



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- Meta Directory, a single interface method, reduces the cost to develop and implement systems;
- Greater flexibility is achieved in security with Smart Card and PKI; and
- This project is consistent with Portal implementation and Federal Bridge PKI project.

#### 1.3.2.19 Business Continuity

##### a. Description

The Office of the Chief Information Officer (OCIO) System Business Continuity Plan will decrease risk by spreading USPTO information assets across multiple, load-balanced physical locations. The objective of this initiative is to guarantee the availability of patent and trademark data to patent examiners, trademark attorneys, the general public and foreign patent and trademark offices in the event of a disaster resulting in the complete or partial destruction of the USPTO's single data center.

If there were a disaster or catastrophic failure at the USPTO data center, it would take months to restore the over 200 terabytes of critical data and to rebuild all of the servers and networks that provide access to the data. Through this approach, OCIO will be able to provide data, server, and network replication following the complete implementation of the Disaster Recovery Plan.

The USPTO is proposing a phased implementation for deploying dual, load-balanced data centers. The phases would enable the USPTO to start with protecting its most critical assets – patent and trademark data. Through an evolutionary process this phased implementation will support disaster recovery capabilities in the event of a disaster at the USPTO primary data center and eventually dual, load-balanced data center operations. Each phase supports the evolution toward the goal of dual data center operations.

The phased implementation strategy follows widely accepted industry best practices for the phased implementation of E-Gov load balanced operations. The phases would enable the USPTO to start with protecting its most critical assets – patent and trademark data. Through an evolutionary process this phased implementation will support disaster recovery capabilities in the event of a disaster at the USPTO primary data center and eventually dual, load-balanced data center operations. Each phase supports the evolution toward the goal of dual data center operations. The implementation strategy is to deploy the business continuity initiative in five phases as summarized below:

- **Phase 1 – Planning, Initial Data Center Infrastructure and Initial Data/Server Replication**: The first phase (to be accomplished by CY 2003)



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involves establishing a baseline Disaster Recovery capability (for two key applications) that is scalable, moveable and flexible. This will provide a ‘proof-of-concept’ for the remaining phases of the project. This phase involves implementation of the Disaster Recovery services that is inclusive of a data center with the required redundant facilities services, network connectivity, application servers and data storage systems to support the replication of data for selected mission critical applications and the servers to support those applications. Selecting a service and a site that fits within USPTO’s requirement gives USPTO the ability to provide for critical baseline Disaster Recovery capabilities in the short term, while allowing USPTO the flexibility to grow the capabilities at the selected location or migrate to another end state location if desired. In summary, the key objectives of Phase 1 are as follows:

- Establish a baseline I/T Disaster Recovery Capability;
  - Deploy a disaster recovery Proof of Concept for two mission critical applications (ePhoenix and TICRs);
  - Determine overall requirements for Disaster Recovery and System Recoverability;
  - Identify USPTO systems/applications that require the most protection during data center move; and
  - Complete Business Impact Analysis (BIA) and Recoverability Analysis (RA).
- **Phase 2 – Data Center Infrastructure, Planning and Additional Data/Server Replication**: The duration for implementing this phase is expected to be twelve months starting from October 2003. The second phase involves the support of fiber network connectivity between two USPTO Data Centers. This connectivity will enable data replication between primary and secondary Data Centers in a synchronous or “real time” mode. In the event of a disaster or a catastrophic failure, critical data and supporting servers will be available at the secondary data center. The network connectivity will also provide additional network functionality in later phases of implementation. In addition, USPTO business processes, supporting applications and systems, and their interdependencies will continue to be fully documented. This data will be used to finalize the capabilities matrix and Business Continuity/Disaster Recovery service level agreements required for each business system supporting USPTO operations. The key objectives of Phase 2 are as follows:
- Determine technical requirements for systems backup and recovery;
  - Insure backups for critical systems are secured;
  - Expand the baseline Disaster Recovery (DR) approach to provide DR protection for 10 additional mission critical applications during data center move;



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- 
- Expand the data and storage network capacities to support the demands generated by the additional 10 mission critical applications; and
  - Begin implementation of the long-term I/T recovery strategy recommendations from Phase 1.
- 
- **Phase 3 – Data Replication and System Level Capabilities:** The duration of this phase is expected to be 12 months starting from October 2004. The OCIO will expand the service and data recovery effort from Phase 1 and 2. Additional storage and/or server capabilities will be provisioned to support replication of the remainder of the priority one applications and data, as well as the dependent systems that feed the priority one applications that were not included in Phases 1 or 2. The current efforts underway to detail USPTO business processes, supporting applications and systems, and their interdependencies will be utilized as input to prioritize the applications and systems that are replicated in this phase and subsequent phases. The OCIO plans to replicate all critical applications and data to a secondary site to minimize the impact to the USPTO business and customers. The OCIO will also begin the enhanced server fail over components of the plan by deploying additional servers for remaining mission critical systems. The server fail over efforts will ensure that mission critical systems and applications can be restored after failure. In addition, application and network fail over will be addressed for the remaining mission critical priority one applications. The key objectives of this phase are as follows:
    - Expand the baseline DR approach to provide DR protection for remainder of the mission critical applications;
    - Expand the data and storage network capacities to support the demands produced by the additional mission critical applications; and
    - Deploy host and storage services to support the additional mission critical applications.
  
  - **Phase 4 – Expand Systems Level Capabilities:** This phase is estimated to be a 12 month effort beginning in October 2005. The key activities will be to deploy all the components necessary to support a robust E-Gov application infrastructure for the USPTO. Business continuity Plans will be developed for all business functions, to be tested and implemented in concert with the IT Business Recovery Plan. The goal of this planning is to identify tasks that USPTO business areas must complete to respond to a disaster for their department, so that they can perform vital functions once the I/T infrastructure has been restored. The server fail over strategy will also be expanded to include 20 additional Priority 2 applications, expand the secondary wide area network, and deploy network security systems to provide network security for the new WAN and LAN infrastructures. The key objectives of this phase are as follows:
    - Expand the baseline DR approach to provide DR protection for 20 additional priority 2 applications;



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- Expand the data and storage network capacities to support the demands produced by the additional 20 priority two applications;
  - Deploy host and storage services to support the additional 20 priority two applications;
  - Expand the I/T Disaster Recovery Program to include total recovery of all applications, based on business requirements; and
  - Begin implementation of Business Continuity Planning (provide business function recovery with IT recovery).
- **Phase 5 – Expand Systems Level Capabilities and Implement Dual Data Center Load-Balancing:** The timeframe for this phase is estimated for 12 months starting in October 2006. Phase 5 involves the expansion of the server fail over strategy to include the remaining priority two applications. There will also be a commitment to provide access with the specified service level for non-critical applications. This approach will enable USPTO to procure servers in the event of a disaster and quickly begin restoring access to the non-critical applications. The USPTO will also deploy dual load-balanced Data Center operations and services. The key objectives for this phase are as follows:
    - Expand the baseline DR approach to provide disaster recovery protection for the remaining priority two applications;
    - Expand the data and storage network capacities to support the demands generated by the remaining priority two applications;
    - Replicate data storage for priority three applications;
    - Deploy host services to support the additional priority two applications;
    - Deploy storage services to support the additional priority two and three applications; and
    - Develop contingency plans for less critical applications.

### **b. Commitments and Benefits**

The proposed business continuity plan will meet the needs of the customer and staff by protecting the most critical asset at USPTO – patent and trademark data. The phased implementation will establish a foundation for the ultimate long-range plan that step-wise process that would provide information asset protection for high priority applications. The USPTO will be able to continue operations supporting U.S. and worldwide customers and USPTO staff that are the users of USPTO services.

In addition, the primary benefits of the business continuity plan are improved efficiencies and cost avoidance. One of the most significant lessons learned from September 11<sup>th</sup> is that an organization's ability to recover from a similar disaster is primarily based upon the availability of its data. USPTO estimates a cost of almost \$550 million to work off



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the 47-month production backlog that would develop for Patents as a result of a disaster resulting in the loss of operations in the CPK2/11<sup>th</sup> floor data center.

Essentially, it would take approximately twelve months to restore full operations. This includes provisioning a new data center, reconstructing the network, acquiring servers and storage, and restoring all applications and application data. In the event that we could not successfully recover these files from tape, it would be a huge undertaking to restore patent grants and trademark registration data from the paper copies stored at our Boyers, Pa. remote site. In addition, we would have to request a resubmission of all patent and trademark applications that were in process at the time of the disaster that could not be located in paper form. Notwithstanding the fact that if the worst of fears were to be experienced, a significant number of staff replacements would have to be taken into account. In addition, the loss of critical systems would cost the USPTO over \$7 million a day in lost revenues, not including the loss of productivity costs for over 8,000 employees, and while exacerbating the backlog in trademark and patent pendency. The successful implementation of the business continuity plan will help to preserve the vital business processes of USPTO in the event of a disaster. This would be accomplished by adding IT technology recovery procedures, equipment, and capabilities through a phased implementation aforementioned. In general, business continuity represents the uninterrupted and reliable delivery of services to USPTO employees and customers. This process involves the review of all server and storage infrastructure to optimize the utilization of the software and hardware while ensuring that all critical services are delivered on infrastructures, which will support load-balanced operations.

### 1.3.3 Corporate Support Services

The USPTO is highly dependent on IT to conduct its corporate functions. The IT Corporate Support Services ensures that the daily business of the USPTO continues unabated. The systems that are available support specific activities, such as USPTO lease and building construction projects, reliable information scanning, system support, facilities management, and other important business that is managed at the corporate level. The systems that provide corporate services include Computer Aided Design System (CAD), Enterprise Asset Management System (EAMS), IT Facilities Management System, and the Office Administration Services Request System (OASRS).

#### 1.3.3.1 Computer Aided Design System

##### a. Description

The Computer Aided Design System (CAD) enables the Office of Administrative Services to better manage the USPTO lease and building construction projects. Implementing the ARRIS CAD/Consolidation database on PTONet has permitted centralization of facilities data, engineering drawings, USPTO Consolidation data, and



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administrative back-up procedures. In the future, AutoCAD will replace ARRIS, which is GSA designated space design tool.

#### **b. Commitments and Benefits**

The CAD fulfills the commitment of customers and staff by enabling a true depiction of space usage to develop the space plans, and retains the plans in electronic format. Space design work will be upgraded in the future to comply with GSA standardization efforts in building management that will further enhance facility resource management. The benefits from this system consists of improved resource utilization planning, reduction in paperwork, effective space allocation, and cost management. In addition, facility information can be exchanged with GSA in the same format and medium to expedite and improve oversight and management understanding and approvals.

#### **1.3.3.2 Enterprise Asset Management System**

##### **a. Description**

The EAMS is a COTS system of integrated modules that enable the USPTO to manage and track its automated hardware and software assets. The USPTO's current inventory lists more than 45,000 IT hardware assets and more than 800 COTS software products. In addition to accounting for the location of these assets, USPTO must be able to track their current operational status as well. EAMS permits managers to track the location of all hardware used by the USPTO. Further, it allows development managers to track the change management status of any software for which change is pending on one of the USPTO's physical (hardware) assets. Additionally, EAMS permits automated recordation and tracking by the USPTO Help Desk of system problems reported by system maintenance teams as well as the users of the asset.

Future enhancements to EAMS include the capability for managers to plan and track the deployment and upgrade of new and existing assets. Inherent in this enhancement will be the ability for property custodians to view custody records for their equipment on-line. All property management reporting and certification will be automated with real time reports. The current EAMS handheld asset management data collection devices are obsolete and will be replaced with updated equipment and software. The existing interface with the Enterprise Management System (EMS) will be expanded to generate more problem records that will result in faster resolution of problems and improved service. EAMS will be integrated to the Automated Call Distribution System permitting help desk callers to be automatically identified thereby accelerating the process by which service is provided to the caller.

##### **b. Commitments and Benefits**



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The EAMS is an IT infrastructure function that supports all business areas as well as IT infrastructure. The Enterprise Asset Management System enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, and migrate AISs to operate on an evolving infrastructure. Key benefits include:

- Improved desktop service support through improved knowledge;
- Enabling the CIO to better anticipate and plan for employee and customer needs and problems, and manage future changes through the use of a historical base of knowledge about the management of IT resources; and
- Providing a superior level of support to its employees and customers by tying business information to the IT resources that support the mission-critical application.

#### 1.3.3.3 IT Facilities Management System

##### a. Description

The ITFMS will enable the OCIO to accurately and expeditiously produce and view facility information within eight hours of the most recent change. The system will employ a commercial off the shelf-automated tool that will provide information regarding the Production Data Center. Future enhancements to this system although not contemplated for the initial release, include the following: (1) Communication rooms/closets; (2) Boyers Data Center; (3) Dissemination Data Center; and (4) Enterprise Call Center Room

The system will adhere to the following principles of facilities management:

- Every IT Facility has an assigned IT Facility Manager;
- Each IT Facility Manager is responsible for performing the three basic duties and responsibilities for his/her assigned facility as identified below;
- Coordinate and approve all modifications of the facility: changes to physical infrastructure; changes to signal and electrical wiring/cabling; changes to hardware equipment (i.e., new installations, relocations, reconfigurations, removals for repair, surplus designations, etc); changes to maintenance coverage on hardware;
- Forecast and monitor environmental conditions of the facility;



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- Safeguard assets contained within the facility in accordance with USPTO asset management policy;
- Each IT Facility Manager is responsible for ensuring that all electronic information regarding his/her facility is not outdated by more than 8 hours;
- Each IT Facility Manager is responsible for maintaining the interface between OCIO's IT facility management process and USPTO's asset management process to ensure compliance with asset policy; and
- Office of Technical Plans and Policy (OTPP) provides support to each IT Facility Manager and maintains the official records for OCIO's IT facilities.

#### **b. Commitments and Benefits**

The ITFMS will provide rapid and systematic information regarding the status of equipment and the physical infrastructure of the IT facilities that are monitored. Specifically, ITFMS will provide the following.

- **Equipment Documentation**: ITFMS will document the physical location of devices with connectivity and tracking asset information;
- **Provide Basis for What-if Planning**: Provide color-coded drawings of data centers with resident equipment to facilitate "what-if" planning; and
- **Report Generation**: Provide status and location of all equipment current to within eight hours of the most recent change to the IT Facility.

The ITFMS will provide the following benefits:

- Accomplished growth objectives by scaling the technology infrastructure;
- Improved customer satisfaction through reduction of downtime;
- Effective response to business events with technology-driven projects;
- Better financial decisions as a result of more readily available technology asset information; and
- Increased operating efficiency with better change management processes.



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#### 1.3.3.4 Office Administrative Services Request System

##### a. Description

The OASRS provides a consistent centralized method for USPTO employees to request services from the Office of Administrative Services through the PTONet. Additionally, OASRS now provides management and users a capability to check the status of various requests. The system tracks each request based upon a unique control number that it generates. The system also generates statistical reports that will be useful to management. These efforts are being implemented through the automation of USPTO-1464 Forms. The system, in addition to making user friendly forms more accessible, also makes it possible for employees to be more aware of the type of services available from the Office of Administrative Services while facilitating the tracking and monitoring processes.

##### b. Commitments and Benefits

The Corporate business area enables the USPTO to carry out its mission by providing effective resource management. OASRS provides the following benefits:

- Immediate receipt, acknowledgement, tracking and checking of all requests for service;
- Elimination of the redundant function of redoing forms at administrative stations through the USPTO;
- Direct routing of correspondence through signatory authority for budget approval;
- On-line, electronic submission of requests for administrative services from the actual requester to the person responsible for insuring that the service is rendered;
- Scheduled and ad hoc management reports for all supervisors exercising authority over the process; and
- Built-in, on-line, remote application administration and reporting.

#### 1.3.4 Enterprise Office Automation System

Office Automation projects enable the USPTO to maintain current business production, improve the quality of service, and migrate AISs to operate on an evolving and modernized infrastructure. Systems within this initiative include mail routing, newsgroup services, and web services. The maintenance of software license agreements is also managed under this activity.



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#### **1.3.4.1 Desktop Software Licenses and Maintenance**

##### **a. Description**

The software licenses are maintained to enable end-users to operate the software for their daily responsibilities. The types of software licenses range from Microsoft Desktop Configuration agreements to Norton Utilities. The licenses are necessary to enable enterprise-wide usage of these applications.

##### **b. Commitments and Benefits**

The commitments to the customers and the staff are being met by ensuring that they have use of the software applications and network access through purchases of additional licenses or renewals. Depending on the software license agreement, end-users can perform the required tasks by using software applications. The benefit from this activity is allowing users to have access to software applications, network access, workstation, and other IT desktop resources to conduct their daily business.

#### **1.3.4.2 Office Automation Server Administration**

##### **a. Description**

One of the key aspects of this project is to operate and maintain the USPTO's exchange and public folders utility that allows users to send and receive electronic mail among USPTO employees and the Internet community. Exchange also enables users to send and receive encrypted digitally signed messages within the organization. Exchanges Public Folders utility provides the USPTO with general announcements, flyers, and organizational information. The users can post their own announcements in a forum environment, including calendar functionality that allows USPTO personnel to coordinate and schedule activities, meetings, and tasks.

In addition, there is centralized server support for a large number of mission-critical business and office automation applications. The centralized support entails daily operational management of more than 100 network and office automation file NT servers and 385 network printers, and Unix servers in support of the Enterprise Wide Login (EWL) system, PKI, and external mail gateways. USPTO Windows NT domain is also supported. Windows NT allows the servers and clients to communicate with each other, perform network file and print services, provide server based application troubleshooting capability, and restore server operations. Microsoft Systems Management Server (SMS) is also maintained through server administration, which allows server and desktop configuration management, remote workstation operation, and automated software distribution. Additional functions include ensuring connectivity to business area systems, fault management, performance management, capacity management, and Network



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Operating System security. Office automation servers have ongoing hardware replacement on a 3-year cycle, and provides for a cost effective network-attached storage system through redundancy and capacity expansion.

#### **b. Commitments and Benefits**

This activity satisfies the commitments to the customer and staff by offering internal and external email delivery, public folders, system event notification, clear central desktop security policies, high performance servers, increase in reliability, centralized server support, and administration and operational support for new systems. The servers are also expandable, handles technology refresh, and provides PKI. The benefits gained from the server administration include: (1) production capability through the use of email communication; (2) rapid response to outages; (3) site wide information dissemination; (4) enhanced desktop security; (5) increase in workload capability; (6) uniform desktop configuration support; and (7) increase in server uptime.

#### **1.3.4.3 Workstations**

##### **a. Description**

An important aspect of Workstation project is the acquisition and deployment of the new microcomputer desktop and laptop operating system and the office automation suite. The USPTO has elected to standardize on the COTS software promulgated by Microsoft, i.e. Windows and Office respectively. The rapidity of releases and the need to ensure that all internally developed packages will continue to function after deployment of the COTS packages precludes implementing every new operating system and office automation suite. To ensure continuing compatibility the USPTO implements concurrent alternating releases of the operating system (Windows) and the office automation suite (Office). By deploying compatible packages the USPTO is assured that the operating system and the office automation suite will function well together and that the AIS packages will only have to be modified to match one level of COTS rather than being concerned with potentially conflicting packages.

The development and use of "To-Be" architecture, and will continue to be, of paramount importance to achieving efficient USPTO business processes. The OCIO will continue to investigate and, as necessary, implement various hardware and software technologies that are emerging from industry to take full advantage of the advances in IT. A critically important enterprise function is desktop configuration testing to make sure that there are no conflicts between applications running on the desktop workstations and that new applications can be loaded via the network without disrupting the previously installed applications. In addition, services are provided for in-house troubleshooting of desktop problems, by diagnosing failed equipment and software.

##### **b. Commitments and Benefits**



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Workstation projects support all business areas as well as AIS development projects. Workstation activities enable the USPTO to maintain current business production, improve the quality of service, and enhance current business and IT infrastructure, and migrate AISs to operate on an evolving and modernized infrastructure. Periodically modernized desktop workstations will provide benefits to customers and staff by:

- Saving time and money by replacing older CPUs which are no longer under warranty and are more-susceptible to problems which cause costly downtime for Patent Examiners, Trademark attorneys and other USPTO employees;
- Providing employees with current desktop CPUs to handle the resource intensive PTO COTS and AIS software - such as the E-Gov suite of applications - to maintain business production capability in an environment of increasing workloads;
- Ensuring that Physical security prevents theft/lost workstation/peripheral assets;
- Preventing the PTO of costly, older equipment, aids in cleaning up the Asset Mgmt database so it represents more of an active inventory of CPUs at the PTO and ensures sensitive data is sanitized from CPUs prior to surplus to protect the PTO's intellectual property;
- Preparing PTO to successfully attain E-Gov goals in an increasing workload environment by providing robust CPU memory and processing capability necessary for AIS and COTS software; and
- Reducing support costs associated with the standardized environment promoted by the CPU Replacement Program (CRP) that results in less variance in the hardware and software that must be maintained.

#### **1.3.5 Data Management Services**

USPTO enterprise-wide data management services are aimed at providing clear, concise, consistent, unambiguous, and easily accessible business data throughout the USPTO and in applications shared throughout the worldwide intellectual property community. The data management program addresses such data requirements as accuracy and timeliness; improved management decision making through better access to more accurate and timely data; increased productivity in the information collection and processing activities as the understanding and use of available data increases; existing data shared to the maximum practicable extent, cost avoidance of redundant data collection and storage; and reduced cost of system maintenance and time needed to modify implemented systems by designing more stable and flexible data bases.



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In the past at the USPTO, each business area defined data without regard to an enterprise-wide view. This has changed. The USPTO has in place policies for data management and data element standardization. Much of the USPTO's data relied on to make accurate decisions are modeled to support reuse, and data definitions are standardized to support data sharing at the physical level.

The components of a strong data management program to support USPTO decision making and operations include an enterprise data model, standard data elements, technical design naming conventions, an enterprise information repository, a data quality improvement and monitoring function, a data stewardship project, management of XML assets through the repository, and support for UML.

- The enterprise data model is complete, with validation and the addition of details to occur over the next fiscal year. This model exists, in part, to support reuse of system development work. The development of data models for business areas continues to support systems development, always drawing from the data in the enterprise data model. Once completed and validated, subject areas in the enterprise data model will be continuously modified based on data requirement changes to USPTO business practices, and as defined in the future expansion of automated systems. As the USPTO migrates systems from the current Information Engineering methodology and tools to an Object Oriented methodology and tools, the enterprise data model will be migrated and realigned. Data management policies and procedures will be updated to support the Object Oriented methodology. The enterprise data model will be used as the starting point to develop the Data Reference Model (DRM) under the Federal Enterprise Architecture (FEA).
- Data modeling and standardization support reengineering of the USPTO business processes. Data modeling identifies the information needs of an activity. Data modeling is a communication tool that provides an accurate understanding of the data required for the USPTO to conduct its business. Model-based data standardization will continue to reduce redundancy, facilitate single-point-of-entry of data, and provide for the reuse of data. An important activity is mapping physical and legacy data elements to standard data elements to enhance data understanding and sharing, which is accomplished through the information repository. Metadata (information about data) management is being perfected through optimum use of repository tools and procedures. As AIS development efforts increase, data modeling and standardization support will be continuously expanded to identify new, sharable information. The new sharable data then will be defined, modeled, and standardized to promote data sharing;
- Technical design data naming convention is a set of rules for naming the physical design data elements such as table, columns, foreign key columns, primary keys, indices, and referential integrity constraints. Enforcing a consistent data naming



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structure from system-to-system minimizes the development effort to create and maintain physical data and promotes data sharing USPTO-wide. Logical and physical data elements of a project are linked through its (Oracle) data base in the Enterprise Information Repository.

- The data quality program is institutionalized. Its purpose is to measure the USPTO's ability to convert data into mission-critical information and correct any problems, such as compliance to business rules that govern data. The data quality program strives to enforce a data quality management process that systematically conducts audits, sets up monitoring systems, and certifies business critical data. This will improve the quality of information upon which business decisions are made and enterprise performance is reported. The data quality program is driven by current business projects. New information systems that are designed with proven, high quality data receive better feedback from users when the system is delivered. Delivering and maintaining quality data supports major USPTO goals of data sharing, interoperability, and re-use; and
- A data stewardship program has been initiated to achieve full data management maturity at the USPTO. The mission of the Data Stewardship Program is to work directly with business users to establish policy and define responsibilities to promote reliable information throughout the USPTO. The objectives of the program are to ensure that data is correctly identified and defined from not only a business perspective but from an enterprise perspective. The enterprise perspective relies on coordination of data requirements across business areas or system boundaries along with conflict resolution. This coordination ensures that the data used across business areas or systems is consistent, useable, and reliable for all business users. The Data Stewardship program promulgates the concept that data is a valuable corporate resource and as such it requires management encompassing its creation, use, protection, documentation, change, and disposition. The Data Stewardship program defines three levels of data steward for USPTO business information: Business Area, Operational, and Technical Data Stewards. Designation of data stewards allows the data management program to perfect the definitions of data and ensure that data is used correctly and is properly secured. The data stewardship program will be revised to align with the Business and Data Reference Models on the FEA. In FY 2000, an initial program overview and introduction was conducted at the Trademarks Data Quality Project Training Seminar. The Data Stewardship team conducted a series of management briefings in FY 2001 to several organizations under the OCIO and business users, introducing the concept of achieving data quality through a data stewardship program. Several data stewards meetings were conducted shortly after the briefings to identify the associated data stewards for the Patent data. In FY 2003 the Trademark business users, along with the Trademark and Electronic Government Business Division and Data Administration Division under CIO met to identify the associated data stewards for the Madrid Contracting Parties. The



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necessary changes to the USPTO's central repository and Application Clearinghouse are being addressed so that the three levels of data stewards can be documented. In FY 2004-2005, the Data Stewardship team will start to re-evaluate the assignment of data stewards on 852 existing Standard Data Elements;

- The USPTO has developed concepts and systems to support the filing, examination, publication, and archival storage of intellectual property documents in electronic format using XML. To facilitate the implementation of these concepts and systems, the Office of Data Architecture and Services developed a XML Resource Repository Program that establishes effective configuration control of the USPTO's XML assets, including Document Type Definitions (DTDs), schema, entities, style sheets, and document instances. The XML Resource Repository is comprised of two separate parts: the XML Product Library and the XML Tag Data Base. In FY 2000, a Technical Note was prepared, outlining the procedures for managing the SGML/XML Resource Repository. The technical note was approved by the SEPG in FY 2001, making managing the XML products an official function of the Office of Data Architecture and Services. The document provides guidance to the XML developers on naming conventions for the XML tags and products as well procedures on how to upload the DTDs to the repository and reuse approved DTD products. There are 85 DTDs imported from the Patent, Trademark, and Dissemination business areas into the Product Library. The tag information associated with these DTDs is captured in the XML Tag Data Base, providing a linkage between the AISs' physical information that is being implemented, to the logical standard data elements. Tagging information from other business areas will be collected as development projects are initiated. In FY 2001, realizing the limited functions of the current XML repository, the Office of Data Architecture and Services worked in tandem with the Office of Information Dissemination Services to research and select the appropriate XML tool. XML Cannon was chosen as the tool of choice to manage the USPTO's XML products after a productive market research. XML Cannon was presented to the SEPG and incorporated into the USPTO's Technical Reference Model. A justification paper was prepared, analyzing the need to move the DTD products and tags from the XML existing repository to the XML Canon. Shortly after the tool was approved, DTDs from EFS, EPCT, Red Book, and MPEP were uploaded into the XML Canon Repository. The establishment of an international agreement for the electronic filing of patent applications under PCT (PCT AI Part 7 Annex F) and the adoption of the Madrid protocol for Trademarks represent commitments from the USPTO to adopt and adapt to agreed upon XML resources. They also represent agreements to implement certain aspects of XML in specified ways to ensure maximum interoperability of documents and data files between Patent and Trademark organizations. With the present structure of the XML Technical Working Group, the Data Administration Division, and the XML Technical Note,



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the USPTO has the ability to enforce these commitments across the enterprise;  
and

- The UML is a flexible and comprehensive way to design and diagram any software development project. It is a language for specifying, visualizing, constructing and documenting the artifacts of software systems, as well as for business modeling and other non-software systems. With the increasing popularity of Web applications using object-oriented techniques at the USPTO, the UML will become a new standard modeling language for software systems. The Office of Data Architecture and Services is positioning itself to support the UML to assist Web developers in modeling their Web applications as a part of the complete system and the business logic that must be reflected in the application. The Data Administration Division along with the Center of Excellence is testing a third-party tool that can be used to convert the current ICASE data models into Rational Rose models.

#### **1.3.5.1 Data Base Administration**

##### **a. Description**

Data Base Administration operations support a complex and large IT environment that provides mission-critical information across the USPTO in support of all business applications. The staff is highly skilled and organized to support this complex environment. The maintenance of the Oracle data base management system software is a key component of this project in addition to difficult data base troubleshooting exercises, for nighttime and weekend data base monitoring and backups. To a smaller extent, mass storage capability will allow experimentation with new Oracle releases and to develop a small-scale database tracking system.

##### **b. Commitments and Benefits**

Data Base Administration provides a reputable and reliable standard data base management system (Oracle) with the ability to easily maintain the data base management system and upgrade it in a complex environment. This efficiency enables continuous improvement in service quality and reliability. Support for database administration is also enhanced regarding nighttime and weekend requirements for backups, data base monitoring, and implementation of changes. As a result, the benefits are as follows: (1) ensure that a very critical USPTO asset – data – is available whenever needed to support all USPTO business areas; (2) meets business requirements for information excellence; (3) fulfills business requirements for data quality and reliability; and (4) supports business customer requirements for high availability of supporting systems. The implementation of security controls is a recent effort requiring a strong commitment of data base administration resources.



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#### 1.3.5.2 Data Management

##### a. Description

The operational activities in support of the USPTO's Data Management program include maintenance of our robust enterprise data model, standardization of USPTO data elements, a data quality improvement and monitoring function, support for data stewardship, management of XML assets through the repository, and over arching support for UML. FY 2004 and outer years increases are attributable to support of the 21<sup>st</sup> Century Strategic Plan and its critical projects, especially Patent and Trademark e-government initiatives, portal strategies, and customer management; to ensure data quality activities occur, and to facilitate data integrity in data base design and data sharing among projects as the USPTO moves to an object-oriented methodology and to develop and leverage the Data Reference Model (DRM) under the Federal Enterprise Architecture.

##### b. Commitments and Benefits

The USPTO-wide data management program supports the macro policy performance goal of helping to protect, promote, and expand intellectual property rights systems. It accomplishes this by protecting and leveraging a very critical asset – data. This is a Corporate Support commitment employing the strategy of effectively managing resources as well as leveraging information technology. Benefits of the data management program are as follows:

- The program establishes database design policies and procedures that promote data integrity, reduce data redundancy, facilitate single-point-of-entry, and promote reuse of data;
- A viable data management program helps achieve the goal of delivering quality software products when promised and within cost estimates by working with the development teams early in the Life Cycle;
- 
- Standardizing and using standard data is an enabler for making processes reusable and sharable across the USPTO. System development and maintenance are supported and expedited with a common starter set of data elements culled from the repository. Standardization also supports data sharing and enhanced data quality;
- Enforces logical and physical data naming conventions in AIS's data element development efforts. Use of consistent data element names supports business policy to treat data as an enterprise-owned asset. Having data element names



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clearly defined establishes the groundwork to minimize data redundancy, increase data sharing, and improve data quality;

- Data sharing reduces storage costs and facilitates more efficient systems development;
- Enhanced data quality occurs when the meaning and characteristics of data is totally unambiguous. The user then has a higher level of confidence in the data;
- Creates a central focus for a data quality awareness program;
- Assigning data stewardship roles to the AIS business users and OCIO staff ensures data is correctly identified and defined from both the business perspective and the enterprise perspective;
- Providing an effective procedure to create, exchange, and maintain XML resources (i.e., DTDs, schemas, entities, style sheets, and document instances) by utilizing existing data elements from the XML Repository supports data sharing;
- Monitoring data quality at key points ensures that the data will support USPTO Information Requirements; and
- Supporting UML to assist developers in modeling their Web applications as a part of the complete system along with the business logic and promoting the shareable objects and methods to maximize their reuse.

#### **1.3.5.3 Database High Availability**

##### **a. Description**

The availability of database information to customers and staff is critical for USPTO AIS. This project allows deployment of database systems for Patent and Trademark business areas, thereby, leveraging high availability technologies to support E-Gov projects. In order to deliver this function, the USPTO additional Oracle software licenses are needed to support Oracle High Availability Database capabilities. The current Oracle licenses held by the USPTO allow all USPTO employees to access Oracle databases. The USPTO must acquire additional Oracle licenses in order to support E-Gov projects and to continue unlimited Internet access to Oracle databases.

##### **b. Commitments and Benefits**

The commitments to the customer and the staff are being met by enabling robust database systems to supply critical data. This effort is achieved through database consolidation



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and high availability of database systems. The progress being made in E-Gov is also attributable to readily available database systems with low failure rates. In addition to these commitments, the benefit is that the customers and staff have readily available access to critical information from database applications regardless of hardware or software failure.

#### **1.3.5.4 Electronic Records Management**

##### **a. Description**

The USPTO Electronic Records Management (ERM) program is a comprehensive set of activities to keep machine readable information human interpretable for as long as the business area requires access to that information. The ERM program provides a standards-based approach to managing digital records electronically by storing metadata about a record but leaving that record in its native repository. This practice will enable intellectual control of USPTO digital records without requiring physical custody. The ERM program allows the agency to meet the Government Paperwork Elimination Act (GPEA) requirement of having a record keeping system for records maintained in electronic form. The current model of distributed records management and record stewardship of paper by the business areas will be expanded to include electronic records. The envisioned system will provide a pointer to the information that already exists in the respective business areas' Automated Information Systems and capture only mandatory metadata related to electronic record keeping function. The system will not replicate any electronic records or metadata that are currently captured and managed in the AISs.

##### **b. Commitments and Benefits**

The ERM program supports the USPTO's 21<sup>st</sup> Century Strategic Plan by enabling greater productivity through shared access to official records; increased capability through implementing a Vital Electronic Record Archive; and increased agility by not forcing a one-size-fits-all electronic records management solution on all electronic records. The program accomplishes these commitments by protecting and handling efficiently a very critical asset—the records that contain our data in electronic form. This is a Corporate Support commitment employing the strategy of effectively managing resources as well as leveraging IT. Benefits of an electronic records management include the following.

- Compliance with GPEA requirements by providing ease of access of records within USPTO business areas and to public customers;
- Disaster recovery support and systems management, critical to ongoing USPTO operations;



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- Coordination of properly approved disposition of records, including transfer to the National Archives and Records Administration. This procedure supports efficiency in USPTO operations;
- Better dissemination of knowledge of electronic records management and best practices to the records stewards and business users, to promote efficiency and quality in USPTO business operations;
- Improve access to important records. Important functional electronic messages and documents are easily saved and retrieved with standard records management procedures in place, the driving goals of the USPTO's records management program. This improves efficiency of business operations, ensures that individuals other than the creator can more readily retrieve electronic records, and ensures that electronic records are managed as a business asset;
- Methodically storing electronic records, archiving non-volatile electronic records, and disposing of electronic records accordance with an approved retention schedule reduces overloaded hard drives and shared drives. It enhances the ability to use automated systems effectively, and minimizes the extraneous electronic information that would otherwise need to be reviewed;
- Improved Work Environment: The physical surroundings of USPTO staff will be improved as the need to retain paper copies of documents are eliminated from desks, floors, and file cabinets. The space currently occupied by paper could be better used. The work area will be cleaner, and generally more esthetically pleasing;
- Cost Savings: The cost of storage and retrieval of paper copies of records should decrease as the electronic record keeping function is implemented USPTO-wide;
- The roles and responsibilities for effectively managing electronic records are clearly defined, which provides direction to relevant USPTO areas and helps ensure that the needs for effective management of electronic records are met;
- The program collaborates with the USPTO IT organization to identify and provide records management direction on methods to protect the enterprise's electronic vital records, which include those records that are required to continue operations after a disaster or that establish the financial or legal rights of the USPTO, its employees or intellectual property stakeholders; and
- The program identifies confidential electronic records and collaborates with the USPTO IT organization to outline acceptable practices to protect the information in these records, which heightens the employees' awareness of the confidential



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nature of the electronic records and establishes a framework for protecting the works of intellectual property stakeholders.

#### **1.3.5.5 Enterprise Data Quality Tool**

##### **a. Description**

The Enterprise Data Quality Tool suite consists of the Quality Manager and dfPower Studio tools. These tools, as part of the TRM, are being used to assist the Data Administration Division staff, along with the developers and business users, to measure the level of compliance between data of a physical database and the business rules that define that data. The benefits of using these tools include pinpointing opportunities for data quality improvement, improving information quality for both internal and external customers, and reducing the proliferation of poor quality data. The tools are vital to supporting USPTO and OCIO values concerned with quality improvement, to guaranteeing regulatory compliance by ensuring business rules are enforced at the data base level and to avoiding costs associated with poor quality data.

##### **b. Commitments and Benefits**

Both the customers and staff have access to complete and accurate data by conducting quality assurance tests using the Enterprise Data Quality Tool suite. This data quality tools can perform data validation for completeness and validity, analyzes domain data, assesses the integrity of the database structure, identifies and removes redundant data, and validates address information. These types of data quality management allow the USPTO to enforce business rules compliance and assist in the transformation of compliance rulemaking. The benefits associated with this effort has constructive outcomes such as (1) ensuring the proper usage of data values in USPTO mission-critical systems; (2) ensuring that mandatory data is captured and valid data is used in USPTO mission critical systems; (3) ensuring that records are unique and the cardinality between records are correct; (4) ensuring regulatory compliance by enforcing the business rules at the database level; (5) certifying that data from source system was successfully moved to target system; (6) minimizing multiple source updates and potential for errors as well as saving storage space; and (7) minimizing bad address information and removing duplication from the Address database, allowing the USPTO customer experience a positive one.

#### **1.3.5.6 Enterprise Information Repository**

##### **a. Description**

The Enterprise Information Repository, a critical component of the USPTO's enterprise architecture, supports quality and process improvements in USPTO's core business functions. The Repository provides a mechanism to centralize, manage and standardize



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USPTO information resources and metadata, thereby, representing the primary means for managing and sharing information from the USPTO's diverse information environment. The metadata comes from many disparate data stores and tool repositories in a central location; this linkage has great business value by allowing business users to see the relationships between the "islands" of metadata using one tool with an interface specific to their needs. This interface eliminates the time consuming practice of opening several different tools to gather the bits of information from each data source to formulate the desired result by having the information readily available from one source. The USPTO has adopted the Rochade repository tool as the standard information repository tool. Rochade is a specialized network-centric data base management system that controls the information flow within the application development environment. This application controls and integrates platforms, models, artifacts, tools, techniques, methodologies, people, and projects. These elements are analyzed and defined within its repository information model (RIM), which generates the specialized schematic that drives the repository database. Rochade is an extensible and scalable application for metadata storage and manipulation.

#### **b. Commitments and Benefits**

The Enterprise Information Repository meets the commitments by allowing users to: (1) manage and share information from the USPTO's diverse information environment; (2) integrate and track USPTO data standards; (3) determine data items for inclusion in the Enterprise Data Model; (4) perform impact analysis; (5) facilitate data model reviews; (6) manage logical to physical data mappings; (7) facilitate metadata management for the Enterprise Data Model; (8) provide robust user support and maintain custom applications; (9) perform administrative and operational support; (10) manage and share information in the AETS' Application Clearinghouse and support concurrent technical review; and (11) provide the ability to integrate model-based architecture.

In addition, the following benefits allow users to (1) establish an easy method to disseminate USPTO information assets by eliminating the time consuming practice of opening several different tools and platforms. Many disparate data stores are related in a central place for a more complete picture of the USPTO data and applications environment; (2) adhere to data standards, in alignment with USPTO policy. Data standards are centrally maintained and readily available to data modelers and developers; (3) increase opportunity for data sharing, in alignment with USPTO policy. Centrally storing the metadata from logical data models eases the identification and comparison of potential enterprise objects; (4) quickly assess the impact of data or model changes across multiple tools, applications, and projects; (5) enable storing the metadata in a central location from logical data models, and accelerating the data model review process by automating the comparison of models to other models and to the standard data elements. As a result, data quality and compliance to standards is improved and information excellence is promoted; (6) provide mappings that show the connection between the logical data models and the physical databases to help business users understand the



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complete picture of the USPTO data environment--promotes data integration efforts; (7) centrally store the metadata in the Enterprise Data Model as well as project data models which allows rapid execution of generating user reports to identify compliance or discrepancies between the project model and the Enterprise model; (8) develop enterprise information assets applications to enable business users the specific information they require in a format that they need; (9) respond to the users of the Repository as quickly as possible and utilize the user feedback to further enhance the repository into an effective business tool; and (10) continually maintain backups and enhancements that make the repository a reliable business tool. Functionalities and capabilities of the enterprise information repository are extended to create the Application Clearinghouse to support high quality technical reviews and demonstrate alignment with the Federal Enterprise Architecture.

#### **1.3.5.7 Records Management**

##### **a. Description**

Records Management is an USPTO-wide activity that ensures compliance with the Federal Records Act of 1950, while assisting business areas to operate more efficiently through the use of optimum records management practices. Under this activity, effective controls, such as disposition instructions, are established for the maintenance and use of records used to conduct USPTO business. Standards and procedures are instituted to improve the management of records, to promote the maintenance and security of records, the preservation of long term and permanent records, and to facilitate records access. The USPTO Records Management program consists of records management and agency information collection activities. It ensures compliance with the Paperwork Reduction Act and offers support for related OMB directives under the E-government initiatives. Records Retention and Information Collection are two of the three items under the Federal Enterprise Architecture Business Reference Model, Support Delivery of Services. They are considered key to the Business Management of Information.

An active, effective USPTO-wide Records Management program is mandated by law and dictated by common business sense. Such a program supports on-going operations and facilitates the re-engineering and optimization of USPTO business processes. A well-executed vital records program supports disaster recovery. Attention to electronic records management is crucial to successful IT planning and must go hand-in-hand with the development of AISs. A standardized manner of handling records across the agency contributes to efficient operations. The USPTO Records Schedule provides such standardization.

One of the primary activities performed by the Records Management staff is to ensure that all USPTO records are scheduled through the National Archives and Records Administration (NARA). The published schedule provides the instructions for the disposition of the records, which may include permanent retention, deletion, updating, or



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disposal. This schedule is available not only in hard copy but also on the USPTO's Intranet through the OCIO home page. The USPTO Records Management staff maintains a close liaison with NARA. In 2003 the USPTO entered into a Memorandum of Understanding with NARA to pilot a new "big bucket" scheduling process that targets mission-critical records in each business area, when the long-standing NARA-defined approval process for scheduling records became a barrier to meeting our business goals. The USPTO entered into an agreement that takes advantage of NARA's targeted assistance program and, in addition, offered NARA assistance in their development of new business methods for scheduling all federal records. This cooperative initiative with NARA revamps the way all federal agencies schedule and manage records.. The USPTO is expected to save time in managing its records and obtain a more stable, media-neutral set of records dispositions, to support new initiatives under the USPTO's 21<sup>st</sup> Century Strategic Plan.

Other services provided by the Records Management staff include assisting USPTO offices to organize their records for maximum operational efficiency, coordination and tracking of records stored off-site, training records coordinators in all USPTO business areas, and facilitating heightened awareness by management of the value of proper records management procedures.

A major activity in the realm of records management focuses attention on the management of electronic records. USPTO-wide electronic records management issues were identified in 1999. These must be resolved over the next several years for the USPTO to successfully implement an electronic workplace. The aspect of the program is described in section 5.6.2.1. Attention to vital records is also a key activity. Considerable progress has been made in this area with the completion of a vital records directive in mid-1999.

The information collection program operates to ensure the implementation of the Paperwork Reduction Act (PRA) of 1995. It is a critical undertaking within the USPTO Records Management program. It requires continuation of the USPTO's federally mandated information collection program. Under the PRA, federal agencies are required to review their public information activities to ensure that no unnecessary burden is placed on the public to respond to these collections. Wherever possible, federal agencies are required to reduce the burden to the public of responding to these collections, whether that information collection is voluntary or mandatory. Reducing burden can take many forms – from revising or eliminating current rules, establishing new rules, streamlining agency practices, and revising forms. Electronic commerce and the Internet are also changing the way that information is collected and disseminated. The PRA and other federal-mandated acts stipulate that federal agencies investigate electronic filing and electronic dissemination of information as a means to reduce burden.

Reports on agency progress towards full compliance with the GPEA (allowance for electronic transactions with the public) focus heavily on the agency's compliance and



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activities under the PRA. The GPEA requires government agencies, by October 2003, to provide business users with the optional use and acceptance of electronic documents, signatures and electronic records keeping, when practicable. In FY 2001, the OMB began requiring each agency to submit an updated plan on an annual basis. The information reported is essentially a summary of the agency's strategy and progress with GPEA compliance, the summary of the compliance of agency PRA collections, and an update of dissemination activities and agency transactions with other agencies. An USPTO-wide review of activities and programs is necessary to collect and prepare this report. In FY 2004, the GPEA reporting will be incorporated into a new annual report required under the E-Government Act of 2002. That act requires agencies to develop "citizen and productivity-related performance measures for use of E-Government and IT in meeting agency objectives, strategic goals, and statutory mandates."

Under the Records Management program, various information collections from USPTO program offices are validated to be in compliance with the PRA. The Records Management staff works with the program offices to ensure that new information collections are in compliance with the PRA. The information collection packages are prepared and submitted to OMB for approval. The USPTO Records Management staff maintains a close liaison with OMB. The Records Management staff prepares an annual Information Collection Budget report, the results of which OMB sends to Congress each year. This report provides the agency's budget associated with its information collection to the OMB. The Records Management staff also provides PRA support in certain instances to the rulemaking, Freedom of Information Act (FOIA) request, and Privacy Act activities of the Office of General Counsel. In FY2004, it is expected that OMB will pilot a new ROCIIS II software program that will automate portions of the agency's PRA submissions to OMB.

### **b. Commitments and Benefits**

The USPTO-wide Records Management program supports the macro policy performance goal of helping to protect, promote, and expand intellectual property rights systems. It accomplishes this by protecting and handling efficiently a very critical asset—the records that contain our data, both in paper and electronic form. As the agency assigns official records status to electronic records, records existing in AISs must be treated as such. The implementation of the new General Records Schedule 24 will continue in FY2004 as will an effort to heighten awareness of appropriate records management of system software, Lifecycle Management documentation, inputs, outputs, and backups. The NARA-approved disposition provides the USPTO with the legal right to retain, update, delete, or destroy records. This is a Corporate Support commitment employing the strategy of effectively managing resources as well as leveraging information technology. The benefits of the Records Management program are described below:

- The program improves access to important records. Studies on records management indicate that executives waste almost six weeks per year trying to



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find items that have been misplaced, misfiled, or mislabeled. They spend about eleven percent of their time looking for items they or their assistants cannot find. It is estimated that a single misfile can cost \$150 in lost personnel time. Important functional documents are easily saved and retrieved with standard records management procedures in place, the driving goals of the USPTO's records management program. This functionality improves efficiency of business operations;

- Improved record keeping and electronic record keeping will lend support to an efficient Agency relocation to the new Carlisle site;
- Proper and current records dispositions support the USPTO 21<sup>st</sup> Century Strategic Plan initiatives. They will assure electronic initiatives move forward where electronic record disposition is of concern.
- The program identifies and provides direction on methods to protect the USPTO's vital records, which include those records that are required to continue operations after a disaster or that establish the financial or legal position or the rights of the USPTO, its employees or intellectual property stakeholders;
- Proper monitoring and tracking of information collection activities provides source data for studies, reports and reviews associated with recent presidential management agenda items and e-government initiatives.
- The program identifies confidential records and outlines acceptable practices to protect the information in these records, which heightens the employees' awareness of the confidential nature of the records and establishes a framework for protecting the words of the intellectual property stakeholders;
- Methodically retiring records offsite and destroying records in compliance with a schedule reduces space and furniture requirements, resulting in considerable savings to the USPTO and improving the work environment and increasing staff efficiency;
- The program ensures that existing information collections from program offices are renewed before they expire. Information collections associated with various AISs are monitored closely to determine if they will require OMB approval under the PRA;
- The program supports the agency to determine the agency's budget for its information collections. The significant increases and decreases in the public burden and the causes for them are described in the annual Information Collection Budget (ICB) report. The ICB report covers budget data resulting from information collection activity in the current fiscal year and an estimate for the



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next fiscal year;

- The program assists the Office of General Counsel in reviewing, in certain instances, the USPTO rulemaking packages, FOIA requests and Privacy Act activities, ensuring all of the information requirements are covered and that any changes to existing rules that affect the information requirements are reviewed and submitted to OMB for approval; and
- As information collections become available in a web-based format they are monitored for compliance with the PRA and other federal regulations.

#### **1.3.5.8 Records Management Tracking System**

##### **a. Description**

The Record Management Tracking System (RMTS) is an integral part of the USPTO records accessioning process (removal of inactive records from the USPTO) in support of Federal law and regulations. The system was implemented to address all processing activities performed on all accessions (or boxed series) of inactive records to NARA Federal Records Center (FRC). The RMTS is available to all USPTO business areas. This system supports the agency functions to comply with the Federal Records Act of 1950, while assisting business areas to operate more efficiently through the use of optimum records management practices. Tracking records allows for the disposal of records that would otherwise cost the agency unnecessary rent on prime office space and that would unnecessarily complicate searches for information.

##### **b. Commitments and Benefits**

The RMTS fulfills the commitments to the customers and staff by enabling them to manage the retention and destruction activities of USPTO records in a systematic approach. Support is provided to the USPTO Records Officer and program offices to track USPTO records. Records Coordinators are provided with a tool for management of records stored off-site. This automatic tracking system can manage storage and retrieval of agency's accessioned records. The benefits of the RMTS are primarily legal compliance and cost savings. First, the legal and financial rights of the agency are protected in compliance with 44 U.S.C. 31 and 36 CFR 1220-1236 and 36 CFR 1228. Second, USPTO operating costs can be reduced as agency access to vital records improve in accordance with 36 CFR 1236, OMB Circular A-130. Third, RMTS serves as a knowledge management tool for business areas. Lastly, RMTS effectively supports agency Freedom of Information Act activities.

#### **1.3.6 Customer Support Services**



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The primary focus of the Office of Customer Support Services staff is to “keep the trains running.” That is, the staff has the responsibility to provide desktop hardware/software support services; manage desktop configurations; create and distribute information such as user guides, policies and procedures, notices or announcements, and newsletters; and provide Help Desk support, to both internal and external customers. The in-house staff is augmented by contractors to provide the full range of services required across the various hardware and software platforms in use.

The staff has two objectives. The first objective is to improve the services provided so that customers have timely, reliable, innovative, and cost-effective access to USPTO information technology when and where they need it. The second objective is to reduce costs so that the increasing number of customer IT requirements may be met. Achievement of these objectives, as evaluated through performance measurements, enables the staff to better meet and to exceed customer commitments and established service level agreements

#### 1.3.6.1 Customer Information

##### a. Description

The Customer Information Services Division (CISD) develops user and service guides to assist the customer with the use of new products, services, procedures, and policies. In addition, CISD publishes a quarterly newsletter to keep customers apprised of upcoming IT activities, share successes, provide helpful hints, and reiterate processes when beneficial. CISD also creates and distributes announcements, which are posted on the Intranet, as well as provides the IT Support Announcements via the daily “What's New” internal e-mail message to all USPTO employees.

The goal of CISD is to provide greater and more effective customer access to information, in using USPTO IT resources and services, and related policies and procedures. The Division develops informational products, consolidates and revises existing products to maintain standards of consistency, and updates products to reflect IT infrastructure changes. Recent efforts include the quarterly publication of *CIO News*, publication of office automation user guides and service guides such as *USPTO Internet Access Guide*, *USPTO E-Mail User's Guide*, *USPTO Windows NT User's Guide*, and *Ordering Computer Equipment at the USPTO*, the development and maintenance of OCIO related Intranet web sites, and the development and distribution of other IT related documents.

##### b. Commitments and Benefits

Information Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Information Services enables USPTO to maintain



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current business production, improve and enhance current business and IT infrastructure, and enhance and improve the tailored lifecycle management process.

In addition to meeting these customer commitments, Information Services provides benefits to customers and staff alike as described below:

- **Increased Customer Satisfaction**: A critical component of IT satisfaction is the level of understanding and expertise made possible through communications with the customer. Higher levels of understanding and expertise often mean that customers can derive greater benefit, in the form of enhanced productivity and ease of use, from their IT tools;
- **Efficient Customer Communication**: Keep USPTO customers informed of changing and evolving IT is critical to the successful use of the tools and resources provided to the customer. Publications such as *CIO News*, and office automation user guides and service guides provide the instructional and procedural information that customers need to effectively utilize IT tools and resources. Additionally, through these publications, USPTO business needs for standards, policy, and guidelines are conveyed; and
- **Section 508 Compliance**: Communicate USPTO efforts in digital format in accordance with Section 508 requirements, and develop supporting 508 documents.

#### 1.3.6.2 Desktop Field Support

##### a. Description

The Desktop Services Division is responsible for resolving problems, moving, deploying, and surplus desktop hardware. The staff strives to meet customer expectations for courteous, prompt, and expert service. Demands on the Desktop Services staff have risen steadily with the increasing dependency upon IT and the growing complexity of the technology. The impact of Desktop Services on customer satisfaction with IT is enormous.

The Desktop Services staff strives to repair or replace failed hardware within 4 hours of notification and to respond to group printer problems within 1 hour of notification. The Desktop Services staff is improving hardware deployment services by tightening the monitoring of hardware inventories and modifying deployment procedures.

##### b. Commitments and Benefits



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Desktop Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Desktop Support provides benefits to customers and staff alike through the following services:

- Providing prompt resolution of desktop hardware related problems; and
- Ensuring timely and successful completion of deployment requests.

#### **1.3.6.3 Electronic Business Support for Public Customers**

##### **a. Description**

Technical assistance is provided to public customers that use online USPTO systems for Patent/Trademark applications, status inquiries, payment, and other functions. This project is consistent with USPTO's goal of increasing online filing. Inquiries from public customers regarding USPTO electronic business systems are resolved to ensure that the electronic transactions are reliable.

##### **b. Commitments and Benefits**

The use of electronic business systems enables public customers to easily monitor the progress of their online filings. The benefits of this type of support is that increasing number of customers will file online, and customer confidence will rise as they become more accustomed to online filing versus paper filing. In addition, help desk support will ensure that the inquiries are being adequately addressed.

#### **1.3.6.4 Help Desk and Desktop Software Services**

##### **a. Description**

The Help Desk and Desktop Software Services is the primary point of contact for IT problems and service requests. The Help Desk and Desktop Software Services receive and record the problems and service requests. The Help Desk and Desktop Software Services trouble-shoot and either resolves or reassigns problems. The Help Desk and Desktop Software Services provide support, such as desktop software installation and reassign others. The staff strives to meet customer expectations for courteous, prompt, and expert service.

Demands on the Help Desk staff have risen steadily with the increasing dependency upon IT and the growing complexity of the technology. The impact of Help Desk and Desktop Software Services on customer satisfaction with IT is enormous. The Help Desk and Desktop Software staff must use automated resources to improve productivity and to meet customer goals for availability and quality support services. The Help Desk and Desktop Software Services will gather detailed information on the handling of customer's



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calls, problems, and service requests. Help Desk and Desktop Software Services staff analyzes data provided by the Automatic Call Distribution system to report call volumes and to report the average answer speed of incoming calls.

The Help Desk and Desktop Software Services are implementing changes to respond to customer calls more quickly, reduce the number of customer calls that are either abandoned or sent to voice mail, return voice mail calls more quickly, increase the number and types of problems that are immediately resolved by the Help Desk staff, and improve the handling of those problems and service requests which are not immediately resolved. To complement the Help Desk and Desktop Software Services, an Advance Problem Resolution team handles the most difficult problems and follow-ups on unresolved problems and service requests.

In addition, the Help Desk and Desktop Software Services assist in the implementation of Knowledge Paks. Knowledge Paks are on-line repositories of AIS and product-specific trouble-shooting information, which will enable the Help Desk and Desktop Software Services to immediately resolve many of the problems that they must now reassign to others. Knowledge Paks were developed for those automated information systems with the largest customer bases. In the near future, Knowledge Paks will be developed and deployed at the same time that each new automated information system is deployed, regardless of the size of the customer base.

The Help Desk and Desktop Software Services has expanded the Customer Quality Check process, which is used to gather customer feedback on the handling of problems. This process has expanded to include customer feedback on service requests, as well as, problem calls.

#### **b. Commitments and Benefits**

The Help Desk and Desktop Software Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. The Help Desk and Desktop Software Services provide benefits to customers and staff alike as described below:

- Providing a single point of contact for requesting IT related services and for reporting IT related problems;
- Providing prompt completion of desktop software related service requests and resolution of desktop software related problem reports; and
- Following procedures in the Operational Support Plans to ensure that problems and service requests are handled properly.



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#### 1.3.6.5 Web Services

##### a. Description

The USPTO uses IT to disseminate information to the public (Internet) and to USPTO employees (Intranet). This information includes patents, trademarks, technical standards, and on-line dialogue and discussion groups. The USPTO Intranet provides browser access to internal web servers and access to the Internet for e-mail and database searches. Internet access at the examiner desktop has been in production for five years. Daily usage continually grows as the new availability of data to enhance searching is employed. The use of Internet electronic mail, newsgroups, and web services has significantly improved the USPTO's ability to provide current information to help employees do their job. Additionally, more and more AISs are being targeted for the browser. This makes the support of the browser environment more critical in the coming years to perform the necessary support functions as described below:

- Support the development, deployment and maintenance of web-based services;
- Provide Web administration services on primary USPTO Internet and Intranet servers;
- Evaluate and provide recommendations to the System Architect on the feasibility of commercially available web tools;
- Provide services such as web page design, troubleshooting, recovery, and maintenance strategies for COTS applications designed to operate within the Web;
- Provides support services to Web enabled AIS projects;
- Gathers statistical data on the web site usage; and
- Provide support for the web client.

New technology will continue to evolve and enable users to have faster access to more timely data, which will trigger demands to increase the use of IT to help manage programs and provide new services. More significantly, the impact of Web Services on customer IT satisfaction is significant. The Web Services Division (WSD) provides expert assistance to expand customer access to databases in a newly evolving and continuously changing environment.

##### b. Commitments and Benefits



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Web Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. This activity enables the USPTO to maintain current business production, and improve and enhance current business and IT infrastructure. In addition to meeting these customer commitments, WSD provides the following benefits to customers and staff alike:

- The quality, accuracy, and efficiency of USPTO employee efforts often depend on their ability to access information in a timely manner and in a useful format. WSD provides cost-effective access to information;
- Intranet applications and services provide dynamic access to legacy data through standard web interfaces; and
- As the Intranet continues to develop, it has the potential to become the resource for training, reference material, and electronic services.

### 1.3.7 Common Services

The primary focus of Common Services is to support operation and maintenance of computer facilities, hardware, software, and telecommunications capabilities deployed in support of the USPTO business processes. The in-house systems and networks provide the full range of services required across the various hardware and software platforms in use. The services include Enterprise Management System (EMS), Enterprise Wide Login, Fax/Modem system, Integrated Tape Backup System, Operating System upgrades, and PKI.

#### 1.3.7.1 Enterprise Management System

##### a. Description

Since 1994, the USPTO has focused on replacing the heterogeneous collection of incompatible hardware and software systems with a standards-based open system IT infrastructure through EMS. New systems and capabilities have been deployed based on distributed client-server architecture with heavy reliance on PTONet to deliver needed services. While the USPTO's distributed computing environment provides many business related benefits, the Operations staff is faced with many new challenges in managing it. The USPTO's IT infrastructure will ultimately consist of two key hardware platforms and their associated operating systems: HP/UX and NT, and a single database management system: Oracle. Currently, USPTO has over 112 HP/UX application and database servers. In addition to the Unix-based servers, the USPTO has approximately 185 NT application, office automation, and workflow servers dedicated to providing office automation and custom application services. USPTO has a continuing need to deploy additional servers as applications, users, and data volumes increase.



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One of the IT management objectives is to automate computer center and network operations. In the past, when all processing was mainframe-centric, there was IT processes and products to manage the environment. These products and services cannot be migrated to the new open architecture. To successfully manage its IT infrastructure and support both its ongoing and new business processes, the USPTO is adopting the concept of an enterprise view of system and network management. Software tools to support enterprise services are commercially available. These products, once integrated, are collectively called an enterprise management system. Enterprise management systems provide for fully automated, proactive system management and service level management of application and data base servers.

The EMS consists of a suite of products and services that together provide an automated and reliable solution for managing the development and operation of selected components and services of the USPTO IT infrastructure. EMS will help ensure the availability, fault management, and automated operation of these parts of the infrastructure. The EMS will correlate, refine, synthesize, and report availability and fault data generated by the selected components of the USPTO IT infrastructure such as: servers, workstations, storage devices, networks, and communication devices. EMS will perform or will have interfaces to such functions as configuration change management, application change installation and recovery, help desk management, problem management, software distribution, system and network management.

EMS will complement the existing Network Analysis product suite and will provide the data from these components; correlate and interpret that data; and provide a filter, translation, and priority for system event messages to avoid potential capacity problems and bring potential performance problems to light.

#### **b. Commitments and Benefits**

The EMS project is an IT infrastructure project that supports all business areas as well as IT infrastructure projects. The EMS enables the USPTO to maintain current business production, and improve and enhance current business and IT infrastructure. Key benefits include:

- Manage selected central and distributed IT components more effectively;
- Enable Network Operations To Prevent Or Respond To Problems;
- Enable the USPTO to maintain a high availability environment in support of E-Gov;
- Enables the USPTO to deliver proactively respond to potential problems prior to a critical situation to avoid impacting the USPTO user community;



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- Improve maintenance and operation of high priority aspects of the heterogeneous complement of equipment and software;
- Enable infrastructure operations to prevent or respond to problems;
- Increase administrative productivity by automating many time consuming administrative routines;
- Improve the IT planning process by ensuring that selected performance measures are tracked and reported at regular intervals;
- Enable AIS Operations to prevent or respond to problems;
- Remain flexible enough to change as the business grows or re-directs itself; and
- Link business information to the IT resources that support the mission-critical applications.

#### **1.3.7.2 Enterprise Wide Login**

##### **a. Description**

Enterprise Wide Login is currently used by PACR, Examiner Automated Search Tool (EAST), and WEST to authenticate and encrypt communications between the users' workstation and the application server. EFS will start using SSO to provide the same function. SSO and Account Management over time need to be deployed throughout PTO provide secured communications across PTONet and to simplify account management. Automated account management is a very important to PTO security process. In FY 2003, The Office of Technology Architecture and Engineering Services (OTAES) will implement Enterprise Account Management and deploy 1000 additional Single Sign-On (SSO) licenses to support secured connectivity to other PTO AISs such as EFS. An additional 1000 SSO licenses are budgeted in FY 2004 in support of PTO growth in the Patent Corps. Beginning in FY 2003, the Active Directory project will create a new architecture for authentication. In FY 2004 and FY 2005 OTAES will migrate from Computer Associate's SSO to the new architecture.

##### **b. Commitments and Benefits**

The Enterprise Wide Login project meets commitments to customer and staff by ensuring a secured, encrypted connectivity to AISs, single account usage to access all application and PTO network services, and centralized account management that enables immediate termination of account services and simplifies account resets. Also, the benefit to this activity is that SSO and Account Management will provide a single user ID and



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centralized password management. When disabling an account, it will be done centrally, and Account Management will disable all associated accounts to prevent a security risk that occurs when disabling/terminating services to a user because there is no way to know all of the systems/services where a user may have an account. This process focuses on NT, Firewall, UNIX, SSO, Oracle, and back-end AIS access via SSO.

#### 1.3.7.3 FAX/Modem System/Capability

##### a. Description

Fax is an official method of applying for Patents and Trademarks. Faxes are received and stored electronically. In FY 2003, the focus has been on creating a searchable repository of official faxes. In FY 2004, a more robust integration of fax and e-mail should be developed, and faxes will need to be exported into the electronic file wrapper. On-going support is also required to operate and maintain the system.

##### b. Commitments and Benefits

This activity meets the commitment to the customer and staff by offering electronic fax send/receive capabilities from the local workstation without the use of a local modem. There are full reporting capabilities for each fax processed (e.g. date time stamp, number dialed, number of pages, etc.), including automatically generated official return receipt of fax, search, and retrieval capabilities of processed faxes, and export feature to other AISs. In addition, the benefits of this system to customers and staff are as follows:

- Increase in efficiency of fax process while reducing security risk on PTONet;
- Better management of all fax correspondences and system performance;
- Reduction in the number of misrouted faxes; and
- Search and retrieval and electronic archiving capabilities to other AISs.

#### 1.3.7.4 Integrated Tape Backup System

##### a. Description

The Integrated Tape Backup System (TBS) delivers enterprise wide tape backup system for standardized enterprise backup and management of critical data for disaster recovery and archive. At the conclusion of Phase 3 in early FY 2003, it is expected that every server in each of the domains will have basic back up & restore capabilities. Some specialty servers (e.g. Firewalls) will be backed up locally as necessary. Phase 4 enhancements will focus on getting concurrent (e.g. Oracle Hot Backup) and synchronous backups across multiple servers in support of business applications.



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#### b. Commitments and Benefits

The TBS enables USPTO to synchronize backup across multiple servers, including hot backup capability (back up run while business applications are still running). Standard procedures are being established for timely and reliable backup of critical data that will further improve reliability and performance of backups. This activity will also provide the processes to improve data recovery procedures. In addition these commitments, the benefits are as follows:

- Improve business continuance capabilities in the event of disasters;
- Reduce operations and maintenance cost of tape backups;
- Support server recovery in the event of a server failure;
- Support data restoration in the event of data corruption, hardware failure, or human error;
- Lower the likelihood and amount of potential data loss;
- Faster data recovery translates to less down time; and
- Control operations and maintenance costs (e.g. lowering cost per terabyte.).

#### 1.3.7.5 Operating System Upgrades/Migration

##### a. Description

The Operating System Upgrades/Migration effort includes the following activities, mostly related to desktops and servers:

**Enterprise Baseline Software Evaluation and Configuration:** This project is to evaluate and configure latest versions of Enterprise Baseline Applications for USPTO. New and/or enhanced versions of enterprise software will enhance user functionality and productivity while lowering overall cost. This project also ensures compatibility with other AISs and applications along with USPTO infrastructure.

**Linux Server OS Infrastructure:** Linux has been gaining industry momentum over the past few years and is expected to become an important part of IT environment in most enterprises. USPTO currently has few Linux servers in operation and more are planned for use. This project is to plan, engineer, develop, test, and migrate all USPTO COTS and AIS applications on Linux Server operating system.



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**Microsoft Client OS Migration:** This activity is to engineer, develop, test, and deploy all USPTO COTS and AIS applications on client operating systems. The current USPTO standard client OS is Microsoft Windows NT WS 4.0, which will not be supported by the manufacturer after June 2003. USPTO will be migrating to MS Windows XP Professional starting in FY 2003 and the migration is expected to be completed in Q1 or Q2 of FY 2004.

**Microsoft Server OS Migration:** This project is to engineer, develop, test, and deploy all USPTO COTS and AIS applications on Microsoft Server operating system. Currently, USPTO is migrating from Microsoft Windows NT Server 4.0 to Windows 2000 server and this migration is expected to be finished in FY 2004. The manufacturer will be releasing Windows 2003 server in April 2003, which offers enhanced security and functionality based on its .NET architecture that supports 64 bit addressing with improved AD functions.

**Unix Server OS Migration:** USPTO currently has multiple versions of HP-UX, Sun Solaris, and new IBM-AIX 5.2. This project is to plan, engineer, develop, test, and migrate all USPTO COTS and AIS applications on UNIX Server operating system.

### **b. Commitments and Benefits**

The plan to upgrade and migrate existing operating systems will achieve the following expected results for the customer and the staff:

- Ensures compatibility with USPTO infrastructure;
- Allows enhanced functionality and user experience;
- Ensures reliability of user applications;
- Improves operating system functionality and user experience customized for USPTO environment;
- Insures compatibility with USPTO supported COTS and AISs;
- Enhanced operating system and application security/reliability;
- Greater interoperability and manageability compatible with USPTO Enterprise Architecture;
- Allows PCs basic functionality to be able to operate AIS/COTS application;
- Ensures software functionality, compatibility, and continued vendor support;



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- Upgrades capabilities that will increase speed and reliability of PCs and peripherals; and
- Enhances operating system and application security.

#### 1.3.7.6 Public Key Infrastructure

##### a. Description

The Trilateral Offices and WIPO are beginning to use Digital Certificates associated with PKI technology to enable electronic commerce among themselves and with their external customers. USPTO is presently issuing Digital Certificates for its PKI services that are used by the ePAVE client of the online EFS. In the same time period EPO has begun issuing Digital Certificates and Smart Cards for electronic filing with their online epoline system. The Offices have committed to work for interoperability among their PKI systems as use of this technology expands. In order to achieve interoperability it will be necessary to synchronize the PKI directory and CA servers of the offices to exchange Digital Certificate related information. The implementation of an effective IT Security Program fulfills the E-Gov project and the Human Capital Improvements within the President's Management Agenda by establishing a robust security infrastructure and a more skilled and knowledgeable workforce regarding IT Security.

##### b. Commitments and Benefits

The PKI meets the commitment to customers and stakeholders by providing PKI authentication and credentials to PTONet, Common Card, electronic and directory services. In addition to these commitments, the PKI provides a single means of authentication to increase user productivity, single credentials for accessing multiple systems, decrease in number of accounts and the ability to exploit accounts, secure electronic patent submissions, and secure authentication of USPTO employees to IT systems.

#### 1.3.7.7 Enterprise Directory Services – Shortfall Project

##### a. Description

The Enterprise Directory Service (EDS) project provides several essential long and near term enterprise architecture solutions, in alignment with the USPTO e-Infrastructure strategy. As the USPTO aggressively migrates towards the federal e-Gov initiative, the EDS solution enables a standards-based authoritative data source for user credentials. The credential store allows access to information systems throughout USPTO increasing system security, while reducing administrative, implementation, and maintenance costs. Leveraging federal standards and the USPTO Enterprise Architecture, the EDS facilitates the central management of employee, customer, and partner information to ensure



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consistency and enhance application and system security. Centralization of the credential store (repository) increases efficiency while initiating the use of organizational Role Based Access Control (RBAC). The EDS integrates existing production Windows 2000 Server Active Directory into an enterprise environment. Several of the EDS features are required for existing and “in progress” AIS deployment such as Windows XP, ePhoenix, PALM, PACR, PKI, EEOC, UCCMS, and TriNet.

Some examples of the essential features that are needed for the near and long-term are:

- **Centralized Access Control & Management:** This feature provides Identity Management with role-based Single Sign-On (SSO) capability across all applications (Windows XP deployment, PALM, PACR, ePhoenix, Portal implementation, EEOC, UCCMS, etc.) at the USPTO, and to enhance the security while reducing the hardware and software cost.
- **Interoperability:** This feature is to provide a standards-based access control infrastructure and methodology in support of the Carlyle Smart Cards, TriNet/Trilateral, PKI, and Federal Bridge initiatives.
- **Structured Organizational Data and Data Provisioning:** This feature standardizes the data synchronization methods and provide a central data repository while reducing the overlapping data amongst applications and access control systems

#### **b. Commitments and Benefits**

The EDS provides a common data storage and publication method accessed through a standard interface (LDAP). Without EDS, the organization will not mature its Information Technology Infrastructure into a seamless environment. This activity improves the ability of the USPTO to make a commitment to its enterprise architecture through the following capabilities:

- Provide essential services for the e-Phoenix Project (Gaining access controls, credential management, interface management, enterprise consistency).
- Compatibility with other directory services and meta-directories with recognized standard methods to Gain Access to Organizational Data (centralized data sharing).
- Cost savings in hardware support (installation time and helpdesk); reduce administrative costs and management of user accounts.
- Interoperability, higher availability, and scalability to reduce down time and associated costs for application migrations.
- Increase security of data and access controls, and easier for the user to access resources across operating systems with Single Sign-On.
- With Meta Directory, a single interface method, reduces the cost to develop and implement systems.



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- Allow a greater flexibility in security with Smart Card and PKI in line with Portal implementation, and Federal Bridge PKI initiative.

#### 1.3.8 IT Security Program

Confidence in the integrity and security of the USPTO's electronic information and the supporting IT infrastructure is essential for creating a trusted environment; in which, USPTO and its customers and business partners can conduct business electronically. The increased use of distributed automated information systems to store, process, and communicate sensitive data throughout the USPTO has added a new dimension of complexity to the traditional security concerns confronting managers and employees. The increasing reliance on networking technologies further complicates the AIS security problem. The significant benefits to be gained from using information technology must be accompanied by the implementation of an AIS Security program that enables the productive use of IT, while reducing the associated security risks to an acceptable level.

The objectives of the USPTO IT Security Program are to:

- Establish and enforce controls for the protection of personal, proprietary, and other types of sensitive data against disclosure, modification, or destruction as appropriate;
- Protect funds, supplies, and material from fraud, theft, misappropriation, or misuse;
- Maintain the continuity of USPTO operations by preventing the occurrence or minimizing the impact of security related events that interfere with normal data processing operations;
- Regularly assess the status and security of USPTO AIS and infrastructure, identify and correct vulnerabilities, and adjust policies and procedures to maintain an appropriate level of protection;
- Provide IT security training to USPTO IT users, operators, and maintainers to promote AIS security awareness and accountability at all levels within the USPTO; and
- Identify and respond to IT security incidents.

##### 1.3.8.1 Security Certification and Accreditation

The Office of Inspector General (OIG) from the DOC has identified a USPTO material weakness attributed to its IT Security Program. This assessment was reported in the FY



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2002 PTO Government Information Security Reform Act (GISRA) report to OMB and is based in part on the absence of a certification and accreditation program for USPTO systems. Failure to remedy the defects in the USPTO security program will constitute federal government negligence in the protection of the private property entrusted to USPTO. The following actions have been taken to address the material weakness relating to certification and accreditation:

- **Certification and Accreditation of USPTO Automated Information Systems:** The USPTO has developed a program for the certification and accreditation of all USPTO operational systems for compliance with OMB Circular A-130. In addition, the USPTO is required to re-certify and reaccredit operational systems every 3 years;
- **Compliance Testing:** Compliance testing is conducted to provide evidence of compliance with IT Security laws, directives, and policies. The Department of Commerce, under the direction of OMB, GAO, and Congress, is instituting a program for compliance testing of major systems in each Department agency. The USPTO has developed a plan for compliance testing for USPTO systems; and
- **NIST Self-Assessment:** Self-assessments provide a method for DOC and other agency officials to determine the current status of USPTO information security programs and, where necessary, establish a target for improvement. This self-assessment guide utilizes a very lengthy questionnaire containing specific control objectives and techniques that will be tested and measured against each automated information system. The control objectives and techniques are abstracts from requirements found in statute, policy, and guidance on security.

#### **b. Commitments and Benefits**

The commitments are being met to the customer and staff through the following actions:

- Security Plans are updated;
- Risks assessments are conducted;
- Contingency Plans are updated;
- Security Tests and Evaluations are conducted;
- Certification/Accreditation documentation is developed for management approval;
- Common event repository is established;



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- Structure information framework (schema) for event recording is developed;
- Solutions for residual vulnerabilities are identified and implemented;
- Each NIST question for IT Security self-assessment will be answered for each operational system; and
- A CIO auditor will conduct compliance testing (vulnerability/penetration) to ensure integrity of USPTO IT Security Program.

In addition, the following benefits of the certification and accreditation process includes:

- Compliance with Federal law including the Federal Information Systems Management Act;
- Resolution of the material weakness declared in FY 2002;
- Security controls that can handle significant changes to the system as well as rapidly changing threats;
- Risk Assessment to a system that is ongoing necessity to ensure that new threats and vulnerabilities are identified so appropriate security measures can be implemented;
- Procedures that are documented to back up and recover a system in event of service interruption;
- Security controls, features, and procedures that are in place and working properly as required before a system is accredited;
- Verification of the accreditation process that has been completed for that system and identifies residual risks;
- No impact ability to analyze log files for root cause due to System failures or corruptions;
- Events from different systems that can be correlated for response to threats or in RCA;
- Log files can be trusted since they are not maintained by the corrupted server;
- Rapid resolution of security vulnerabilities that preclude IFW accreditation; and
- An IT Security Program that will be verified by a third party.



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#### 1.3.8.2 Security Infrastructure Protection

##### a. Description

The USPTO local area network and the operational systems on the network are protected through the use of firewalls, intrusion detection system, public key infrastructure, virus-protection, and enterprise wide login system. In a March 2002 report, the OIG recommended that the USPTO procure, install, and maintain intrusion detection systems. The USPTO has developed a network intrusion detection system, and is in the process of developing a host-based intrusion detection system, which requires more funding. Firewall consolidation will support the upgrade of equipment necessary to support partitioned network zones including external access for partners and contractors.

The USPTO will continue to define and develop enterprise security services. The enterprise services are a vital piece in moving the patents and trademark business process to a system that guarantees the confidentiality, availability, and integrity of the process and the Federal records produced. As USPTO continues to expand its use of the Internet to conduct business with its business partners and customers, greater emphasis will be placed on enterprise systems and services that provide for confidentiality and integrity of the data.

##### b. Commitments and Benefits

The Security Infrastructure Protection activity supports the commitments made to the customers and staff is as follows:

- Reduce number of different firewall solutions;
- Establish "protection zones" that off-load AIS security requirements onto infrastructure;
- Identify modification to system files on critical servers (e.g. network perimeter, finance);
- Protect PTONet communications;
- Identify and test standard system images for USPTO servers and workstations unannounced, independent tests of IT security;
- Develop firewalls support ETC lab protection and AIS test environment;
- Provide virus protection by filtering questionable email; and



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- Provide virus protection by filtering covert attacks from workstations.

The benefit to the USPTO is that there is less vulnerability of USPTO systems and data to malicious attacks. This protection will ensure fewer and shorter disruptions in IT operations. There is also a common architecture that will reduce diversity of assets, accelerates development, and lowers TCO. Since security requirements are "built into" infrastructure, accreditation and transparency is facilitated to users. System recovery is shortened and increases the reliability of security patches. The risk of exploiting critical systems is also minimized. A security "zone" is established that will relieve AIS burden to protect information exchange. Systems are protected from embedded threats and prevented from propagation in terms of virus protection. More importantly, the implementation of the Security Infrastructure Protection project will help USPTO comply with the DOC, OMB, and NIST guidance in addition to the USPTO 21<sup>st</sup> Century Strategic Implementation Plan.

#### 1.3.8.3 Security Operations and Maintenance

Activities to continuously enhance security are essential to consistently provide the reliability, maintainability, and availability of network resources and to achieve the level of operational integrity required to support the needs and expectations of the USPTO user community. Also important is the ability to provide the necessary level of security and enable the rapid infusion of new technology to meet the constantly growing demands of the USPTO workforce. In particular, efficient patch maintenance requires efficient notification, approval, testing, and deployment. Also, effective account management including authorization and termination procedures is required to assure USPTO systems.

##### b. Commitments and Benefits

There are three key components of the Security Operations and Maintenance:

- **Intrusion Detection System**: Network Intrusion Detection analyzes traffic within and exchanged with PTONet. Attack and scan signatures are detected weekly enabling USPTO to block the offender from further attempts. This system has been deployed and is a leading factor regarding the low risk ratings for our perimeter system in penetration studies;
- **Physical Access Control**: This activity provides video surveillance of controlled areas and guard services for the data center. Access cards and other access tokens are used until replaced by common SmartCards; and
- **Security Operations**: This project provides the staff and tools to respond to vulnerability notices and detected incidents including system log inspection, and patch updates. Furthermore, standard security services are practiced, including



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account management (PTONet, AIS, PKI, etc.), risk assessments, investigations, and contingency trials.

In addition to the commitments to the customer and the staff, the benefits are as follows:

- Detect and block internal or external network attacks against USPTO assets are detected and blocked;
- Detect and report Change or corruption of critical server system files are identified and reported;
- Availability and integrity of business systems is maintained;
- Critical servers housed in data center are protected;
- Access control for controlled areas is established;
- Strong authentication for remote access to PTO systems is in place;
- Systems are available and maintained at reduced risk;
- Threats are mitigated and reported in accordance with Department guidelines;
- Threats are identified and mitigated in accordance with HR and Union processes;
- System changes are inspected for security vulnerabilities;
- Procedures and technician expertise for recovery are improved and verified; and
- User system access is supported via account access controls. System vulnerabilities are reduced by elimination of unneeded accounts.

### 1.3.8.4 Security Planning and Compliance

#### a. Description

AIS systems require security architecture definition and engineering expertise across a variety of technologies (firewall, authentication, encryption, anti-virus, etc.). Security architecture definition and engineering enable security solutions that avoid unnecessary exposures and integrate with enterprise architecture at a minimum schedule. In addition, system usage reporting is not available for security investigations or protected from corruption. Auditing enables systems, software, and AISs to report significant events. An auditing solution captures this data in a searchable, protected repository. Auditing



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will enable enhanced troubleshooting, impact assessment, investigations, and legal admissibility with superior quality and responsiveness. The IG Audits and independent inspections have highlighted that USPTO does not have security policy definition with enterprise authority. Security policy communicates the business priority of security and authorizes the methods of enforcement. Without documented policy, USPTO employees have no enforceable obligation to comply with guidance. This project will ensure that policies are integrated with guidance from other federal sources and USPTO business areas by defining, coordinating, and communicating the security policy to the user community. These efforts will be heightened in FY 2004.

### **b. Commitments and Benefits**

The important work of Security Planning and Compliance will meet the commitments made to the customers and staff by developing and maintaining security architecture definition, structure information framework (schema) for event recording, and security policy to ensure compliance from USPTO user community as well as the external users. In addition the commitments, benefits will also be realized, such as:

- Alignment of AISs with enterprise architecture and lower cost of ownership accreditation at a superior security posture;
- Efficient identification and development of security solution by subject matter experts;
- Reliable log files since the corrupted servers do not maintain them;
- Compliance with Federal requirements and basis for enforcing business priorities;
- Reflection and authorization of business priorities and security; and
- Integration of policy into daily activities for enhanced compliance.

### **1.3.8.5 Security Training**

#### **a. Description**

The USPTO is currently working on a plan to require three basic types of IT Security Training: Management, Technical, and User Awareness. Managers will be required to be knowledgeable of their security responsibilities and principles of effective risk management. Personnel in jobs administering and maintaining operational systems are required to be knowledgeable of IT security vulnerabilities, how to correct these vulnerabilities, and what technical procedures should be implemented for maintaining secure operational systems and their infrastructures. The OMB Circular A-130 Appendix III requires that all government employees and contractors take user awareness training



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once a year. The USPTO initially met this requirement in June 2002 and will continue to administer security training.

#### **b. Commitments and Benefits**

The Federal Information System Management Act (FISMA) requires that the agency CIO ensure the training of all personnel with access to IT systems and those who have significant responsibilities for information security. USPTO provides user awareness training and role-based security training. The training will improve the operation of the IT security program – meeting the commitments to the staff and customers. In addition, the overall benefit is that the confidentiality and integrity of USPTO systems will be maintained based on the capacity to prevent system exposure to threats.

#### **1.4 OCIO Program Support Services**

This service supports the implementation of the OCIO program as part of the roles and responsibilities of the CIO at USPTO. The support ranges from assistance with IT acquisition to Section 508 compliance. Project management services are also included such as analysis of baselines, project scheduling, performance goals, and all the other elements of project management. Training, Lifecycle Management, and SEPG support are also important parts of the OCIO support services.

##### **1.4.1 Acquisition Support Services**

The USPTO IT acquisition strategy is aligned with the overall strategy to manage the IT infrastructure separate from the applications and data that use that infrastructure. This strategy also integrates acquisition management into the planning process. Key elements of the USPTO IT acquisition strategy include:

- **Continue to consolidate sources of supply**: Continue to consolidate similar requirements into one statement of work, as practical and reasonable; make the consolidated contracts the preferred sources of all IT products and services; require that acquisitions from other than these preferred sources be justified; and lengthen contract duration when justified by incumbents' performance;
- **Maintain reliable and flexible sources of supply**: Continue to build in flexibility by using technology infusion clauses to prevent obsolescence; include options for future generations that cannot be fully specified at the time of contract award; increase the use of COTS hardware and software; establish USPTO-wide contracts based on technical standards, when appropriate and cost-effective;
- **Continue to enforce technical and contractual standards**: Continue to centralize technical duties of acquisition management and contract administration into one office; ensure that all IT contracts have consistent and enforceable



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- provisions requiring compliance with the USPTO's Lifecycle Management Manual and associated Technical Standards and Guidelines, Technical Reference Model, project management tools, cost/schedule controls, and other standards; and provide incentives for compliance and penalties for non-compliance to standards;
- **Further streamline acquisitions**: Adapt USPTO policies and procedures to take full advantage of streamlining allowed by laws and regulations for acquiring and administering federal contracts, notably the: Federal Acquisition Streamlining Act (FASA), the IT Management Reforms provided through the Clinger-Cohen Act and the resulting revisions to the Federal Acquisition Regulation (FAR), and OMB guidance promoting consideration of past performance in contract acquisition and administration;
  - **Encourage more small business participation**: Require that contracts continue to provide ample and appropriate opportunities for small businesses including increasing the minimum from 20 to 25 percent participation on the System Engineering and Technical Assistance (SETA); enforce requirements that the System Development and Maintenance contractors meet goal of 10 percent and the ITPA small business participation; continue to set-aside the Facilities Management and End User Support (FM/EUS) contract; and continue to use small business contracts for specialized services and limited scope applications; and
  - **Improve management of contract acquisition and administration materials**: Establish Contracting Officer's Technical Representative libraries that contain acquisition documents, orders, deliverables, and invoices for all IT contracts; provide authorized USPTO and contractor staff with on-line access to, and text search of, these documents and materials; and expand the use of electronic interchange of these documents between the USPTO and contractors.

The Acquisition Support projects supply the USPTO with best-value IT products and services to satisfy business requirements for maintaining existing AISs and for developing new AISs identified through business process reengineering efforts. The customers of the IT acquisitions are the USPTO business areas and the Office of the CIO. These customers seek IT contractor services, hardware, and/or software for new or existing AISs. The work to be performed on the acquisition projects falls into two categories: administration of existing contracts, and acquisition of contracts to replace or supplement existing contracts.



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<i>Type of Work Performed on Acquisition Support/Management Projects</i>	
<b>Contract/Order Administration</b>	<b>Acquisitions</b>
<ul style="list-style-type: none"> <li>- Serve as Contracting Officer's Technical Representative on all IT contracts</li> <li>- Help USPTO system development managers prepare AIS project plans</li> <li>- Prepare statements of work, plans, and independent estimates of cost to complete work</li> <li>- Obtain detailed plans with resource estimates from contractors</li> <li>- Evaluate available contractors to determine which should perform the work</li> <li>- Assist in start-up of work and transition from incumbents</li> <li>- Monitor work progress and resolve concerns about delays, overruns, or poor quality</li> <li>- Receive, distribute, and archive contract deliverables</li> <li>- Contract financial management, including monitoring funding status, controlling award fee pool, and processing invoices</li> <li>- Close out contract once work is completed</li> <li>- Assess contractor performance and recommend award fees</li> </ul>	<ul style="list-style-type: none"> <li>- Serve as acquisition managers, including chair of the IT source evaluation board</li> <li>- Conduct market surveys, including interacting with vendors to assess their products and services</li> <li>- Determine acquisition scope, methods, resource requirements, and schedules</li> <li>- Implement new acquisition regulations, guidelines, and practices</li> <li>- Prepare pre-solicitation documents</li> <li>- Obtain approvals to proceed with acquisitions</li> <li>- Prepare solicitation documents</li> <li>- Manage source evaluations, including evaluations of proposals</li> <li>- Conduct benchmarks, operational capabilities demonstrations, and live test demonstrations</li> <li>- Establish contracts as USPTO-wide preferred sources when appropriate</li> <li>- Review requisitions for IT products and services to ensure compliance with USPTO standards and preferred sources</li> </ul>

The following efforts are underway to reuse what has already been done by other projects. Implementation of the IT acquisition strategy will include building on the following models and procedures that have proven successful in previous years:

- **Technical Standard and Guideline for Contract Management:** The USPTO's Project Management Manual documents procedures for managing IT service contracts, focusing on task order planning and control. It is now being used as the model for a new TSG that is under review. This TSG will provide improved guidance for the management and acquisition of new IT products and service contracts;
- **Ordering Guide:** The OCIO prepared this handbook in 1997 to provide a "customer-friendly" document describing ordering procedures and products available from the consolidated Desktop Workstation contract. It is now being used as a model for additional paper and electronic brochures that provide summary-level guidance about acquiring IT products and services;



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- **IT Source Evaluation Boards**: The USPTO established a new Source Evaluation Board in 1995 to manage major IT acquisitions. This board provides the model organizational structure needed to conduct future major acquisitions, now performed by empowered multi-disciplinary teams using streamlined acquisition techniques. Models from SDM, SETA, Desktop Computers, ITPA, and other successful previous acquisitions will be used for future acquisitions;
- **Acquisition of IT Products and Services Policy**: The OCIO reviews all requisitions for IT products and services. The purpose of the review is to ensure that the items or services being acquired comply with technical standards and methodologies; and that when possible they are being acquired from preferred sources. The OCIO works with the Office of Finance and Office of Procurement to screen all requisitions to determine which require IT approval, reviews and either rejects or approves each requisition, and works with customers to find better solutions for those requisitions that are rejected. The procedures include the flexibility to obtain waivers from standards and preferred sources when appropriate, and the delegation of authority for review of certain purchases to the requestor's approving official. Policies and procedures for OCIO review of IT requisitions are documented in a memorandum of agreement among involved USPTO offices, and were announced in the CIO Newsletter volume 5 issue 3 dated Fall 1998;
- **IT Acquisition Management Libraries**: The USPTO has been improving its collections of documents and other materials by centralizing and standardizing collection and indexing procedures, and compiling paper copies of all materials and electronic copies of some of the documents in the collections. The USPTO is now scanning the back file and plans to eliminate paper libraries in order to lower storage costs, reduce problems with lost and archived documents, and improve library customer service;
- **IT Acquisitions Home Page**: The USPTO developed materials about IT acquisitions that were added in 1995 to the USPTO's website home page under "IT acquisitions." This page included copies of the IT plans and requests for proposals for upcoming acquisitions, and was the primary source of materials needed by offerors. This page will be further expanded in the future to include more materials, a user-friendlier interface, and better integration with USPTO and other federal electronic commerce systems;
- **Software Enterprise Licenses**: The USPTO has been establishing enterprise licenses since 1995 with major software suppliers such as Microsoft, Oracle, and OpenText (formerly Dataware); and
- **Asset Inventories**: The USPTO first took and certified detailed inventories of fixed assets in 1997- 1998. Certified inventories of hardware and software are



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now being used in statements of work for support contracts. For example, the inventory of HP UNIX servers is the basis for the contract for hardware maintenance. The inventories previously used were typically prepared ad hoc by the COTR or operations managers, and were not reconciled or certified, so were prone to errors and omissions.

### 1.4.1.1 Acquisition Activities

#### a. Description

The Office of Acquisition Management (OAM) manages the acquisitions and administers nearly all USPTO IT contracts. The OAM uses these "Acquisition Support" funds to obtain contractors who perform the following contract acquisition and administrative activities: (1) conducting market surveys and obtaining price quotes for commercial items; (2) receiving and distributing contract deliverables; (3) managing libraries containing acquisition and contract documents; (4) performing data entry for OAM and USPTO procurement systems; and (5) providing highly-specialized consulting support services when an independent source is required. This contract is the preferred and primary source for these services, and indirectly supports all OCIO offices. The Office of Acquisition Management also has contractor support requirements to assist in re-competing major OCIO IT contracts. The OAM uses these "Re-competition of Major IT Contracts" funds to obtain expert consultants and support contractors to supplement USPTO.

#### b. Commitments and Benefits

Acquisition Support Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Acquisition Support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored lifecycle management process. The benefits to be realized by Acquisition Support/Management projects and services are described below:

- **Faster response in providing IT products and services:** Consolidated contracts provide larger and better-qualified pools of labor and supply channels for IT products. The larger the pool, the higher the likelihood of responding to increasing demands for keeping AISs and the IT infrastructure operational. Enterprise licenses for software, and consolidated contracts for hardware and maintenance, allow more flexibility to quickly infuse new technology;
- **Fewer disruptions in AIS operations caused by gaps in IT supplies:** Poor management of IT contracts can result in disruptions due to a gap in services or supplies. Consolidation and centralized management of acquisitions and contracts reduces the risk of these gaps by: simplifying planning for replacement contracts,



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creating larger and more diverse pools of contract labor and supplies, allowing for broader and more flexible statements of work that can better meet unexpected requirements, and providing a cadre of acquisition expertise to expedite sources to fill emergency needs;

- **Fewer disruptions in AIS operations caused by poor quality IT services or supplies:** Poor management of IT contracts can result in disruptions due to poor quality supplies. Standardization through consolidation and centralized management of IT acquisitions and contracts increases contractor compliance to technical standards. This reduces the risk that AISs developed by the USPTO will be unreliable or difficult to repair when they fail, thereby reducing the potential for major disruptions in AIS support to all business areas;
- **Lower costs for hardware and software:** The standards defined in the USPTO Technical Reference Model, when properly implemented in IT contracts, offer numerous benefits. These standards result in reduction in costs of training internal staff to deal with non-standard products, and increases the likelihood that AISs are open and easily inter-operable. Proper implementation in IT contracts provides economies of scale through acquisition of larger volume and more flexible site licenses, more opportunities for lower cost third-party maintenance, and provides suppliers with better incentives to provide the best hardware and software at the best price; and
- **Lower costs for IT contract acquisition and administration:** Consolidation of requirements has, and will continue to reduce the number of contracts. The associated reduction in the number of acquisition managers and Contracting Officer's Technical Representatives produced FTE savings every year since 1996 by allowing the USPTO to take on the significant workload of acquiring the new contracts and transition from incumbent contract while reducing management and staff time previously devoted to contract administration.

#### 1.4.1.2 Acquisition Management Library System

##### a. Description

The CIO is responsible for acquiring and managing IT contracts. This requires the management of libraries of acquisitions, contracts, task orders, contract deliverables, contract modifications, and support materials related to the contract. All of these materials are currently managed on paper even though most are available in electronic form. The CIO needs an integrated library automation and information retrieval tool that can improve the search and retrieval process for USPTO staff and contractors by facilitating on site and remote access to various acquisition library collections.



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Specifically, the CIO needs software tools that can provide employees and contractors with improved quality of, and enhanced efficiency in, capturing, storing, and retrieving acquisition and contract information. The capability to search stored documents (either word-processed or image files) is especially critical. Potentially useful fields include task order number, document control number, document title, document type, and date. The library user must also be able to circulate and track physical documents. In addition, the need exists to link search request output directly to the full-text of an on-line document and to display the results in their "native" form. The Acquisition Management Library System (AMLS) provides the capabilities that are necessary for electronically managing IT contracts.

#### **b. Commitments and Benefits**

OCIO Acquisition Libraries enables the USPTO to carry out its mission by providing more effective resource management. Automation of the acquisition libraries will provide the following benefits: Automation of the libraries will reduce the time, money and space currently expended filing and managing the retention of paper records. The system will provide the ability for the USPTO to more quickly and effortlessly respond to oversight agency's queries regarding acquisitions, contract management, and contract deliverables. All pertinent records will be available for auditing or research in the preparation of similar acquisitions or extension of existing acquisitions.

#### **1.4.1.3 Contract Management Activities**

##### **a. Description**

The Program Management task order pays the costs for the following contract management activities: (1) recruit, train, and supervise all contractor staff and subcontractors; (2) plan, prepare, submit, and negotiate proposals for all work to be performed; (3) control all work performed, including final quality control and deliverables; (4) manage financial operations including regular and extensive reporting of planned and actual costs; and (5) resolve concerns about contract performance. The USPTO centrally funds and manages these duties to improve controls over the alternative approach of indirect allocation of these costs to the contract's task orders.

##### **b. Commitments, Benefits, and Performance Measures**

The Contract Management Activities provides the formal structure required to control, manage, and report contract administration as required by the Federal Acquisition Regulations (FAR) and Cost Accounting Standards (CAS). Contract management activities also provide central point of control for program management consistency. This project ensures that USPTO is managing contracts in accordance with FAR and CAS regulations, and provides significant management visibility and cost savings



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through accepted and approved program management practices used uniformly on all government contracts.

### 1.4.1.4 Section 508 Support

#### a. Description

New legislation mandates that the Federal Government provide the same level of IT access to everyone, including employees and members of the public with disabilities. Revised Section 508 under the Rehabilitation Act requires that all new IT procurements meet strict standards in order to provide the infrastructure for accommodations. Sections 501/504 provide accessibility accommodations for individuals through the infrastructure. The revised sections specifically provide:

- **IT Planning and Budgeting**: IT plans and budgets must include resources to acquire compliant hardware and software, assistive technology, and support services to ensure that software system development is compliant, and there is staffing to oversee new product compliance and provide Section 501/504 accessibility throughout the USPTO.
- **Acquisition**: When procuring and developing IT products, OCIO must ensure that they comply with the Access Board EIT standards. The government is subject to litigation for violating Section 508 requirements.
- **Workforce Issues**: The OCIO is responsible for Section 508 oversight and for providing Section 501/504 EIT accommodation support to the USPTO. The USPTO EIT Accessibility Coordinator reports to the CIO.

#### b. Commitments, Benefits, and Performance Measures

The Access Board is preparing documentation this fiscal year to determine performance measurements by establishing a baseline, as well as monitoring, and reporting requirements.

Through a joint USPTO effort, a Section 508 procurement process was developed that enables employees to expeditiously procure items within the framework of the law. Current efforts include: (1) providing assistance to software development efforts to ensure Section 508 compliance; and (2) creating a permanent, centralized structure for accommodating employees with disabilities under Section 501/504.

### 1.4.2 OCIO Project Management Support Services

This project enables the OCIO to receive assistance in project management, including baselines, project scheduling, and other facets of project management. Also included is



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penetration testing to ensure adequate security processes are in place. Training, Lifecycle Management, and SEPG support are also important parts of the OCIO support services.

### 1.4.2.1 Automated Project Management System

#### a. Description

To help monitor and provide visibility into actual progress of each IT project, the USPTO has implemented the Automated Project Management tool (APMS). The APMS provides for tracking actual cost and schedule performance against project plans. It also provides visibility to help both business and technical managers identify problem areas and take corrective actions when actual results deviate significantly from plans.

Key areas of support include 1) executive dashboard, schedule, budget, and portfolio management development, maintenance, and enhancement activities, and general day-to-day APMS operations and maintenance support management capabilities.

#### b. Commitments and Benefits

Key benefits to be realized include:

- Improved strategic planning, budget formulation, and investment capital planning;
- Improved life cycle management and access controls to insure the timely delivery of quality IT products and services to the business areas and adequate security

### 1.4.2.2 Lifecycle Management and Software Process Improvement

#### a. Description

This project provides LCM methodology, process, and technology training. As methodologies, processes, and technologies change, organizations need to adapt their lifecycle to new approach of conducting IT business and educate the lifecycle stakeholders in the new methodology or process. Where the need arises for specific training in an LCM methodology, process, or technology, that training is provided through this project. The LCM will be streamlined for simplicity, reduce the workload by developing highly effective documentation, and support and adhere to a flexible process. This effort will consolidate reviews and work products, thereby, improving the quality of work products, leveraging training, and identifying lifecycle process metrics to help guide AISs as they move through the lifecycle. In addition, this project enables contractor support for taking the weekly SEPG meetings.

#### b. Commitments and Benefits



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The commitments to the customer and staff are being met by streamlining work products to capture information once for multiple usages. Process flexibility is improved, and Requirements engineering has been expanded to improve definition of requirements in the elicitation process. The Lifecycle process metrics are identified and implemented to guide AISs as they move through the lifecycle. Education and training are provided for new methodologies and processes. In addition, the benefits of this activity include:

- A mechanism for educating best practices in technologies and methodologies that have a direct impact on software development, and therefore, delivery of business value through quality AISs. This supports the two OCIO values: Valuing employees and Quality;
- Product that can be delivered sooner to customers;
- Products that are higher quality at reduced costs;
- Lifecycle reviews and work products that appropriately align with the scope and complexity of the project;
- Product stability and Customer satisfaction. A robust Requirements Engineering process helps to build the right product; and
- Increase in project success rate by providing indicators that may be used for redirection of lifecycle activities, as needed.

### 1.4.2.3 OCIO Miscellaneous

#### a. Description

Penetration tests are unannounced tests of USPTO IT security conducted by a independent tester who is not otherwise involved in the security, in this case the OCIO Internal Auditor. The purpose of this activity is to attempt to "break in " to an operational USPTO system to reveal vulnerabilities that need to be addressed, and if possible eliminated. The requested funds will be used to hire an independent contractor to conduct these tests under the direction of the OCIO's Internal Auditor. The types of tests to be conducted include attempts to penetrate USPTO's IT physical security measures such as guards and locks, IT infrastructure security such as firewalls and encryption, AIS security such as passwords and use restrictions, IT social engineering security such as procedural and personnel controls, and other security required for systems accreditation.

#### b. Commitments and Benefits

Penetration tests that are unannounced will identify vulnerabilities in the IT security that will enable improvements to be made to ensure that USPTO systems and data are



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protected from malicious attacks. This activity will also create fewer and shorter disruptions in IT operations.

### 1.4.2.4 OCIO Training

#### a. Description

The Clinger-Cohen Act of 1996 requires that the OCIO develop strategies for training and professional development of its staff. The PMA requires the strategic management of human capital. This strategy will allow critical technical training, management training, and project management training to be accomplished.

#### b. Commitments and Benefits

Training in technical, management, and project management of IT assets will lead to effective leadership to manage the organization, identify successful systems/applications to address current and future business requirements, and enable project leaders to manage their activities within budget, schedule, and performance goals.

### 1.4.2.5 Project Management Support

#### a. Description

Project Management Support is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. This support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored lifecycle management process.

Key areas of support include business area-wide IT project management advisory and assistance support services with regard to 1) project plan preparation, baselining, and maintenance, and 2) recurring customized APMS reporting requirements.

#### b. Commitments and Benefits

Key benefits to be realized include:

- Improved project decision making, cost control, and productivity; and
- Expedited and improved problem/issue/risk detection, management, and mitigation.

### 1.4.3 Product Assurance Services



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Product Assurance Services include enterprise services and tools to perform and manage quality assurance, quality control, requirements management, and configuration management activities in accordance to USPTO's LCM process. In addition, enterprise support for configuration management, testing, quality assurance, and requirements management tools are key elements of this service. Investment in an automated CM function yields the following business value: reduces development costs by providing facility for systematic storage and retrieval of project components; reduces development time by keeping development components easily accessible; and reduces risk to the business area by ensuring correct assembly of project components.

### **1.4.3.1 Configuration Management – Enterprise Activities/Database**

#### **a. Description**

This activity supports the development and revision of CM Technical Standards and Guidelines (TSG), pocket guides, and related instructional materials. The Configuration Management library and COTS software repository, including producing file copies of COTS packages, are also maintained through this project. Configuration Management process areas are analyzed and white papers generated based on the analysis. Specific users are given support, such as assisting Help Desk in resolving a specific problem.

#### **b. Commitments and Benefits**

The commitment to the customer and the staff are being met by the development of CM TSG/reference guide, metrics related to CM, and databases that maintain CM processes and results, allowing for continued enhanced to the CM process. Also, the benefits from this activity include the reduction of development costs by providing a facility for systematic storage and retrieval of project components, decrease in development time by keeping development components easily accessible, and risk reduction the business area by ensuring correct assembly of project components.

### **1.4.3.2 Configuration Management**

#### **a. Description**

This activity ensures that AIS technical documentation for USPTO business software is complete, current, and accurate. All technical documentation for software becomes outdated, if not maintained on a regular basis, will no longer be of use in developing, enhancing, or maintaining the software used to support our business processes. The physical configuration audits (PCA) are intended to periodically identify weaknesses and defects in all AIS technical documents that have occurred over time as a consequence of maintenance or enhancement activities, where due to limited resources or other factors, the corresponding technical documentation for these systems could not be appropriately revised. The PCA process helps ensure that all AIS source code, environmental



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components and documentation, and all other AIS work products filed in the Enterprise Configuration Management repository are accurate and relevant.

The IDE must also be specified, designed, developed, and tested in a controlled environment in order to be an effective tool in the development of AIS software. For this reason, Enterprise CM must play a key role in the deployment of the IDE. Moreover, Enterprise CM will also play a critical role within the IDE by managing the deployment of new AIS software, new enhancements to AIS software, and maintenance releases of AIS software to the test and production environments.

### **b. Commitments and Benefits**

The commitments to the staff and customers are being met by ensuring that the technical information needed to support AIS development, enhancement, maintenance, relocation, and disaster recovery is effective and available at all times. All AIS source code is stored in the CM repository and all components of the AIS operating environment are stored in the Configuration Management Repository with accurate documentation. The hardware, software, and documentation of IDE are also maintained. There is effective management of new AIS development, enhancements, and maintenance from the IDE to the test and production environments.

### **1.4.3.3 Enterprise Process Configuration Management Tool Dimensions**

#### **a. Description**

New services, such as release of all production software to the production environment, are being requested of the CM infrastructure that will necessitate that the CM infrastructure be continuously available for use 24 hours/day, 7 days/week. The Enterprise Process CM Tool (PVCS) Dimensions supports the acquisition of hardware maintenance and additional hardware needed to provide this level of service without affecting critical and on-going data back-up processes, and to replace aging Configuration Management infrastructure components currently in service. Key activities consist of Configuration Management System (CMS) version 4.0 Software (SW) release of the CM repository during FY 2004, and subsequently CMS SW releases in FY 2005-FY 2009. In addition, the PVCS Process Manager is an automated tool designed to support USPTO standard Configuration Management. This tool is used to assist the Office of System Product Assurance in ensuring that all aspects of the USPTO Information Technology and the USPTO Technical Infrastructure are well defined, and completely and correctly documented.

#### **b. Commitments and Benefits**



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This activity ensures that the CM infrastructure is reliable and technologically current, with the availability of CM infrastructure 24 hours/day, 7 days/week. The CM hardware infrastructure will support future releases of the CM software tool, applicable database tool, operating system, and related system utilities. The CM infrastructure supports AIS, change management, and configuration control. In addition to meeting the commitments to the customer and staff, development costs are lower by providing facility for systematic storage and retrieval of project components, correct assembly of project components reduces risk to the business areas, development costs are reduced, reliability of AIS software increases, and timely access to AIS' data is ensured by reducing the downtime caused by unexpected failures.

#### **1.4.3.4 Enterprise Quality Assurance Management Tool**

##### **a. Description**

The Enterprise Software Engineering Quality Assurance (QA) Tool will assist OCIO QA staff in collecting current Software Engineering QA data, analyzing trends, performing measures, and data mining eight years of historical data. Software development, tool purchase, vendor training, and contractor support are included in the management tool.

##### **b. Commitments and Benefits**

Using the Enterprise QA management tool will enable market surveys, trend analysis, risk analysis, workflow and process planning, and defect Root Cause analysis to be conducted. These activities meet the commitment to the customer and the staff because the OCIO can quantify the impact of technical policy, procedures, and standards. Also, software engineering QA data collection and data management can be formalized and the QA measuring processes can be improved. The benefit of the QA management tool is that the OCIO process engineers will have the information they need to ensure that quality OCIO products and services are delivered to the USPTO in a manner that is timely and cost effective.

#### **1.4.3.5 Enterprise Requirements Tool**

##### **a. Description**

The Enterprise Requirements Tool enables a close collaboration between engineering and project teams in performing analysis and planning of software and hardware requirements. The funding for this activity is allocated for license renewal, contractor support, and Hardware (HW)/SW upgrades and replacements.

##### **b. Commitments and Benefits**



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The commitment to the customer and staff are met by ensuring that requirements specifications are accurate and complete through close collaboration between engineering and project teams, thereby, having SW/HW customizations that satisfy the end-user computing needs. The benefit of the tool is that savings are realized in terms of development time and costs associated with retrieval of project requirements.

### 1.4.3.6 IT Product Assurance Transition Management

#### a. Description

IT Product Assurance Transition Management (ITPA) allows overlapping and knowledge transfer between the outgoing and incoming ITPA contractor for QA, CM, and testing.

#### b. Commitments and Benefits

This activity will allow for knowledge transfer when the contractors for this work changes. The benefit will be that the new contractor will be able to continue work without a high learning curve.

### 1.4.3.7 Quality Assurance – Non-System Specific, Project Support

#### a. Description

This activity supports the balanced scorecard process through peer reviews and the Root Cause Analysis (RCA) for identifying critical problems with software and hardware.

#### b. Commitments and Benefits

This activity enables staff to perform RCA, conduct trend analysis, write tech notes, and create and maintain database as part of system and project information. This process will establish repeatable procedure in which the correct information can be collected, awareness of areas that needs improvement, and the ability for data mining.

### 1.4.3.8 Quality Assurance – Enterprise Activities/Database

#### a. Description

This activity supports the development of the Quality Assurance Technical Standards and Guideline, QA Reference Guides, technical notes, metrics, and related instructional materials. The QA in process reviews, operation of QA Library, the "lessons learned" repository, and the TRB "action items" repository are also managed through this project.

#### b. Commitments and Benefits



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The commitments to the customer and the staff are the special analysis that can be performed by applying the stored QA information to resolve unique problems or to develop concepts through white papers. The analysis that can be developed will improve the IT decision-making process, identify trends in AIS development, avoid costs through early detection of defects, and prevent same mistakes from occurring.

### **1.4.3.9 Requirements Management – Enterprise Activities/Database**

#### **a. Description**

Requirements Management TSG, pocket guides, and related instructional materials (e.g. training support to Software Development Managers in developing software requirements documentation) are developed and updated. The requirements repository and requirements traceability reports are also maintained to allow for pilot tests of Requirements Engineering and Knowledge Management processes.

#### **b. Commitments and Benefits**

The ability to conduct analysis and develop concept papers regarding Requirements Management will help to reduce the business cost by early detection of deficiencies during the requirements gathering process. Revisions can also be limited by identifying misunderstood requirements early in the process.

### **1.4.3.10 System Acceptance Testing – Enterprise Testing Activities**

#### **a. Description**

The enterprise testing activities consist of different components. First, additional effort is required to support relocation to Carlyle, Virginia. Test scripts will be automated and maintained in preparation for testing baselines. Regression Testing will be performed as warranted by the scheduled moves to Carlyle of employees and servers, to ensure that functionality is maintained between Carlyle and Crystal City. Second, performance and stress testing will enhance system quality by ensuring that bottlenecks that impairs system response times or other performance measures are detected as early as possible in the system development lifecycle. Third, compatibility will be ensured between development AIS and existing desktop baseline(s) prior to deployment. Fourth, the Test Facility and minor computer replacement parts are maintained. Lastly, proficiency of staff will be enhanced for operating automated test tools through training and licensing.

#### **b. Commitments and Benefits**

The commitments to the customer and staff are being realized because systems testing will ensure that the AIS functionality does not degrade after deployment. Systems testing



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enterprise-wide maximize AIS uptime, provide advance notice of system limitations, and minimize the probability of system downtime due to response time problems, concurrent user logins, or other bottlenecks in the system architecture. Automated test scripts and thorough testing procedures will improve testing effectiveness and efficiency, elevate the quality of operational systems, and ultimately, provide a more efficient USPTO operation.

## 1.5 Status – Major Milestones

The timeline for the IT Infrastructure and Office Automation systems are provided in the following table. The information represents major milestones that summarize the level of effort for this portfolio. The table also includes the major milestones for the IT Security Program. The information pertains to acquisition, development, and maintenance activities.

The major milestones for IT Infrastructure and Office Automation are:

Description of Tasks/Products	Start Date	Completion Dates			
		Initial Projection	Duration	Current Projection	Actual
<i>Implement Electronic Records Management in Trademarks Business Operations</i>	<i>03/03</i>	<i>10/03</i>	<i>17 Months</i>	<i>10/04</i>	
<i>Extend PTONet to Carlyle Campus</i>	<i>04/02</i>	<i>11/03</i>	<i>19 Months</i>	<i>11/03</i>	
<i>Implement Automated Tape Backup System – Phase 4</i>	<i>01/03</i>	<i>11/03</i>	<i>15 Months</i>	<i>11/03</i>	
<i>Expand EAMS with EMS Integration</i>	<i>12/04</i>	<i>04/04</i>	<i>5 Months</i>	<i>04/04</i>	
<i>Complete installation of replacement EAMS handheld technology</i>	<i>10/03</i>	<i>09/04</i>	<i>12 Months</i>	<i>09/04</i>	
<b>Completion date: 10/04</b>					



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The major milestones for the IT Security Program are:

Description of Tasks/Products	Start Date	Completion Dates			
		Initial Projection	Duration	Current Projection	Actual
<i>1. Host-Based IDS Implementation</i>	<i>1/03</i>	<i>8/04</i>	<i>578 days</i>		
<i>2. Directory Services Implementation (Single-Sign On)</i>	<i>10/03</i>	<i>9/04</i>	<i>336 days</i>		
<i>3. Firewall Consolidation</i>	<i>10/03</i>	<i>9/04</i>	<i>336 days</i>		
<i>4. Infrastructure Maintenance / Licensing</i>	<i>10/02</i>	<i>9/08</i>	<i>2162 days</i>		
<i>5. Security Operations Base Activities</i>	<i>10/02</i>	<i>9/08</i>	<i>2162 days</i>		
<i>6. PKI Base Activities</i>	<i>10/02</i>	<i>9/08</i>	<i>261 days</i>		
<i>7. Accreditation and Assessment of High-Risk Systems</i>	<i>7/02</i>	<i>12/03</i>	<i>518 days</i>		
<i>8. Accreditation and Assessment of Remaining Systems</i>	<i>10/03</i>	<i>12/04</i>	<i>427 days</i>		
<i>9. Base Accreditation and Assessment Activities</i>	<i>10/03</i>	<i>9/08</i>	<i>1797 days</i>		
<i>10. Training Program Development &amp; Delivery</i>	<i>10/02</i>	<i>11/03</i>	<i>396 days</i>		
<i>11 Annual Training Provision and Licensing</i>	<i>12/03</i>	<i>9/08</i>	<i>1736 days</i>		
<b>Completion date: 09/08</b>					