

**Federal Communications Commission**

# **Information Technology Strategic Plan**

*“Implementing  
technology today to  
meet FCC business  
needs tomorrow”*

Office of the Managing Director  
Information Technology Center



**July 2002**



## Foreword

I am pleased to present the Federal Communications Commission's (FCC) first comprehensive Information Technology Strategic Plan (ITSP). The planning process and the plan itself reflect the maturing and increasing role of the IT program at the FCC. This process also ushers in a new era of partnership between the Chief Information Officer's IT staff and Bureau/Office IT leaders, who together produced the core of this plan. There are several underlying themes presented in the ITSP which I would like you to keep in mind as you review this landmark document:

- First, the IT Strategic Plan outlines the near- and long-term directions for the agency's IT architecture and program. These directions reflect the awareness that IT is a strategic asset that can positively impact every facet of the FCC's mission.
- Second, the IT strategic goals reflect the core mission and values of the IT program; more importantly, these goals directly support the FCC's six core strategic goals - Broadband, Spectrum, Media, Homeland Security, Competition, and Modernize the FCC.

I'm excited about what lies ahead for us in the FCC and the IT community during the next few years. I am confident that our efforts will help the FCC be on the cutting edge in its use of information technology. Here are a few of the initiatives that will make a difference:

- Further evolve our web site and associated applications to meet FCC customer needs more effectively and achieve the goals of the Government Paperwork Elimination Act, which mandates that agencies do more business on the web by October 2003.
- Complete the modernization of our network infrastructure, improve support services to better meet internal customer needs, and provide new IT tools to improve collaboration and knowledge sharing among FCC staff.
- Establish business practices and processes to improve facets of the IT program, such as integrating the strategic and capital planning processes within our budget model, and establishing a more formal process for assessing new technologies.
- Maintain a comprehensive computer security posture in light of ever increasing domestic and international threats and vulnerabilities, especially as we see a rise in sophisticated methods of attack.
- Foster the environment necessary to sustain our high-caliber IT workforce by boosting core competencies and opportunities for professional growth.

Finally, as we look to the future, I am encouraged with the progress we have made and look forward as we strive to further enhance the IT program's contributions to the FCC's mission.

Ronald Stone  
Chief Information Officer



## *The Year in Review – Fiscal Year 2001*

*The IT strategic planning work group developed a list of 178 strategies to actualize the three IT goals articulated in the Plan.*

*These strategies (and associated goals and objectives) will be reviewed annually to gauge our success in improving the IT program.*

*With a favorable budget in fiscal 2001, progress was made in over half of these strategies.*

*Listed here, by Goal, are but a few of our key achievements.*

### ***Goal 1 – Implement customer-focused IT solutions to facilitate information exchange with the public and telecommunications industries***

- ✓ Implemented a series of new business processes including the drafting of the FCC's Information Technology Strategic Plan as well as formalizing the System Development Life Cycle methodology for application development (*crosscutting with all Goals*).
- ✓ Implemented or laid the foundation for several Bureau and Office applications to: streamline them to accommodate new rules and customer requirements; meet accessibility compliance; provide a quicker, more accurate response to public complaints; and upgraded equipment to promote a quicker, more effective response to customer inquiries.
- ✓ Began the work (Booz Allen study) to determine how our legacy licensing applications could evolve to a more integrated set of systems and databases that will increase ease-of-use and lower life cycle costs (*crosscutting with all Goals*).
- ✓ Began 24/7 operational coverage to support customer service requirements and to ensure the customer has the right information at the right time.
- ✓ Enhanced our web presence by redesigning the FCC home page and incorporating standard templates and a new, robust search engine.

***Goal 2 – Provide the IT infrastructure and productivity tools to enhance FCC staff’s ability to execute their statutory responsibilities and mission***

- ✓ As part of our life cycle management program we purchased new, current-state desktops for a majority of our staff and new notebooks and personal digital assistants (PDAs) were purchased to enable a more robust mobile computing environment.
- ✓ Established a new network architecture employing the use of SAN (Storage Area Network) technology and a new back-up system to greatly increase our storage capabilities and enhance data integrity.
- ✓ Began the necessary work to install a new voicemail system for headquarters, Gettysburg, and our Laurel facilities with the added capability of integrating it with both email and FAX.
- ✓ Began the work to migrate from our existing Novell operating and email environment to an all Microsoft environment – including server and client desktop operating systems, Exchange and Outlook for email and messaging services.
- ✓ Initiated an “eFCCT”ive program (KPMG study) that is reviewing the agency’s processes to explore opportunities for improvement through the effective use and leveraging of technology (*crosscuts with Goal 3 as well*).
- ✓ Established a “Desktop Expert” program for FCC staff that will provide expertise and advanced training in core applications such as PowerPoint, Word, and Excel.

***Goal 3 – Provide innovative, responsible, flexible leadership to ensure successful FCC IT programs***

- ✓ Transitioned almost 30 separate technical support contracts into 4 group support contracts that will ease contract administration and potentially reduce annual contractor costs and will provide more flexibility to respond to critical system problems and new challenges.
- ✓ Continued to support our robust computer security posture by aligning several major application systems with their security reviews and began developing a Continuity of Operations Plan (COOP). In addition funded a study to redesign our security infrastructure to provide enhanced flexibility to inner-connect with external computer systems while enhancing our security posture.
- ✓ Continued our leadership role in support of Section 508 to make sure systems, applications, web pages, and all IT purchases meet accessibility compliance regulations.

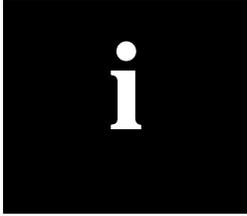


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## Executive Summary

This is the Information Technology Strategic Plan (ITSP) for the Federal Communications Commission. Its purpose is to capture the IT-related goals and objectives of the Commission's Bureaus and Offices, and to define a technical architecture that supports these goals. We learned the Bureaus' and Offices' IT-related goals by reviewing relevant documents, conducting extensive interviews, and conducting working group sessions with internal FCC stakeholders. We then conducted workshops to define the IT-related goals and objectives. The workshops consisted of personnel from the Information Technology Center (ITC), including the Chief Information Officer. The goals and objectives were then presented to the Bureaus and Offices to solicit their input.

This process produced three IT goals, each with subsidiary objectives. They focus on service to the FCC's external constituents, service to the internal FCC staff, and ITC's role in providing technical leadership. The goals and objectives are:

**Goal 1: Implement customer-focused IT solutions to facilitate information exchange with the public and telecommunications industries.**

Objective 1: Evolve FCC systems to respond quickly to industry and regulatory changes.

Objective 2: Provide electronic filing in all cases where it is practicable.

Objective 3: Provide public access to FCC systems, information and customer service 24 hours a day, 7 days a week.

**Goal 2: Provide the IT infrastructure and productivity tools to enhance FCC staff's ability to execute their statutory responsibilities and mission.**

Objective 1: Provide a common IT infrastructure for developing common solutions, while meeting specialized needs.

Objective 2: Provide venues and opportunities for sharing information.

Objective 3: Establish and maintain defined processing and communications service levels.

Objective 4: Provide technical solutions that improve data management.

**Goal 3: Provide innovative, responsible, flexible leadership to ensure successful FCC IT programs.**

- Objective 1: Clearly identify roles and responsibilities and build expertise to support IT programs.
- Objective 2: Define, use, and maintain an IT architecture.
- Objective 3: Provide detailed guidance and proactive controls.
- Objective 4: Continually assess new technologies.
- Objective 5: Ensure compliance with accessibility requirements.
- Objective 6: Enforce IT security.

Table 1 on page i-3 shows how the Information Technology goals support the FCC Strategic Goals.

Strategies were subsequently developed for reaching the goals and objectives. This was accomplished through a workshop facilitation process that included representatives from each of the Bureaus and Offices. The strategies, detailed in Appendix B, stress accessibility, information sharing, establishing and using an architecture, proactive capacity and capacity planning, enhancing and/or implementing electronic filing, document management, remote access, security, and system development and management tools. Several initiatives within these strategies are already being implemented:

- Improve the usefulness of FCC's web site to the public.
- Identify ways to leverage Information Technology to improve the effectiveness of FCC staff.
- Provide tools and training to support a cadre of desktop software experts in each Bureau and Office.
- Identify opportunities for integrating separate FCC databases and systems.

	FCC INFORMATION TECHNOLOGY GOALS		
FCC STRATEGIC GOALS	External Focus: Implement customer-focused IT solutions to facilitate information exchange with the public and telecommunications industries.	Internal Focus: Provide the IT infrastructure and productivity tools to enhance FCC staff's ability to execute their statutory responsibilities and mission.	Technology Leadership: Provide innovative, responsible, flexible leadership to ensure successful FCC IT programs.
Create a more efficient, effective and responsive agency.	✓	✓	✓
Promote competition in all telecommunications markets.	✓	✓	
Promote opportunities for all Americans to benefit from the communications revolution.	✓		✓
Manage the electromagnetic spectrum in the public interest.	✓	✓	

**Table 1: Mapping FCC Strategic Goals to Information Technology Goals**

This plan presents a Technical Reference Model (TRM) as a framework for describing the FCC’s current IT architecture and our target architecture. The TRM is built on the concept of three layered infrastructures: the information infrastructure, the communication infrastructure, and the processing infrastructure. A fourth infrastructure, the security infrastructure, provides crosscutting services that span and protect the other three layers. These four infrastructures set the foundation for the TRM’s core services (e.g., Platform Services, Office Automation Services, etc.). Each service provides specific functionality and is backed by a set of standards. These infrastructures correspond closely to the Technology Architecture and Application Architecture design models of the Federal Enterprise Architecture Framework.

Using the TRM, this plan describes the FCC's current, or baseline, IT architecture, and our desired, or target, IT architecture.

Implementation of the ITSP must be a continuous process to keep pace with changing technology. There are four components to implementing the ITSP: 1) developing a prioritized set of strategies, 2) defining the roles and responsibilities of essential groups and individuals throughout the FCC, 3) defining and following an IT capital planning and investment control processes, and 4) defining and following processes for assessing IT initiatives for architectural compliance.

The ITSP itself—being a definition of common and standardized services, trade and industry standards, and products—must be periodically upgraded to reflect the current state of information and communications technology. The ITSP must be kept up-to-date to provide value to the Bureaus and Offices. It must reflect the impact of new architectural design strategies, new technology, and new or revised standards. Guidelines for updating the ITSP have been developed that include processes and a timeline for updating the goals and objectives, the baseline, and the target architecture.

This plan defines the following groups for implementing and updating the ITSP:

- The Strategic Planning Council (SPC), responsible for reviewing and recommending updates to the FCC's IT Strategic Goals and Objectives, and for evaluating application systems that are in operation.
- The Architecture Review Council (ARC), responsible for reviewing and recommending updates to the baseline and target architectures.
- The Steering Committee (SC), responsible for approving and rejecting proposed updates to IT Strategic Goals and Objectives and the architecture by the SPC and ARC, and for prioritizing OMB budget submissions.
- The Executive Review Committee (ERC), required by OMB Circular A-11, Section 300.5, and responsible for prioritizing the IT operating budget items and approving the rework of the annual IT budget submission per direction of OMB for inclusion in the President's budget proposal to Congress.

The ITSP satisfies requirements established under Clinger-Cohen (Information Technology Reform Act of 1996) and updated by OMB Circular A-130 for developing a strategic planning process and technical reference model. It also parallels the technical aspects of the Federal Enterprise Architecture Framework developed and presented by the CIO Council. The ITSP provides a framework for coordinating FCC's IT initiatives, guiding the acquisition of new information technology that support the Commission's goals, and maintaining and evolving the existing IT infrastructure.

# 1

## Introduction

### 1.1 Scope

This is the Information Technology Strategic Plan (ITSP) for the Federal Communications Commission. It supports the Commission's strategic goals and objectives, which were most recently restated in the FCC's FY 2003 Budget Estimates submitted to Congress in April 2001.

This ITSP includes:

- Section 1, Introduction, presents the scope, methodology, and statutory and regulatory requirements for this ITSP.
- Section 2, IT Mission, describes the role of Information Technology (IT) at the FCC.
- Section 3, IT Goals and Objectives, details the IT strategic goals and objectives for the FCC and associates the IT goals and objectives with FCC Strategic Goals and objectives.
- Section 4, FCC Technical Reference Model Overview, defines the Technical Reference Model, which includes (1) a description of the services that allow individual components to build upon a common infrastructure, and (2) standards that projects should use to make the Commission's IT systems more integrated and interoperable.
- Section 5, FCC Baseline Architecture, describes the IT environment at FCC as of March 2001, and lists needs that are not being met.
- Section 6, FCC Target Architecture, defines the target architecture. It describes how the TRM is used in conjunction with standards and products to realize the target architecture.
- Section 7, Implementing the IT Strategic Plan, provides guidelines for implementing the ITSP. It specifies the actions required, roles and responsibilities, and the processes for architectural compliance assessment and IT investment planning.

- Section 8, Updating the IT Strategic Plan, details the process of updating the IT strategic goals and objectives, the baseline architecture, and the target architecture.

## **1.2 Methodology**

Satisfying the functional, technical and business needs of the bureaus and offices is the primary focus of this ITSP. The planning process addressed these needs by involving internal stakeholders in individual and small group interviews and group workshops where problems were defined and strategic vision and proactive procedures were identified. Reviewing relevant documents and conducting extensive interviews and working group sessions with bureau and office representatives and ITC staff identified the stakeholders' issues and concerns.

After the issues and concerns were compiled and were verified by the stakeholders, facilitated workshops focused on defining the IT goals and objectives. These workshops included the Chief Information Officer and other personnel from the ITC. Common issues were identified and grouped into IT goals and objectives. Bureau and office staff were asked to comment on the resulting goals and objectives. Subsequent workshops with representatives of the bureaus and offices developed strategies to reach the goals and objectives.

The TRM and target architecture were developed from analysis of the FCC's current IT environment, the bureaus' and offices' missions, the IT goals and objectives and the strategies generated in the working group sessions.

In the third and fourth quarters of FY 2001, the ITC staff made minor additions to the descriptions of the goals and objectives, and to the strategies, to reflect new initiative of FCC leadership. This document has undergone, and will continue to undergo, FCC and public review.

## **1.3 Directives**

This creation of the FCC's ITSP satisfies the following specific requirements of law and government-wide policy:

- The **Paperwork Reduction Act** requirement that each agency shall "develop and maintain a strategic information resources management plan that shall describe how information resources management activities help accomplish agency missions." (44 USC 3506(b)(2))
- The requirements of **OMB Circular A-130**, "Management of Federal Information Resources," that:
  - "IRM Strategic Plans should support the agency Strategic Plan required in OMB Circular A-11, provide a description of how information resources

management activities help accomplish agency missions, and ensure that IRM decisions are integrated with organizational planning, budget, procurement, financial management, human resources management, and program decisions.” (section 8.b.(1)(a))

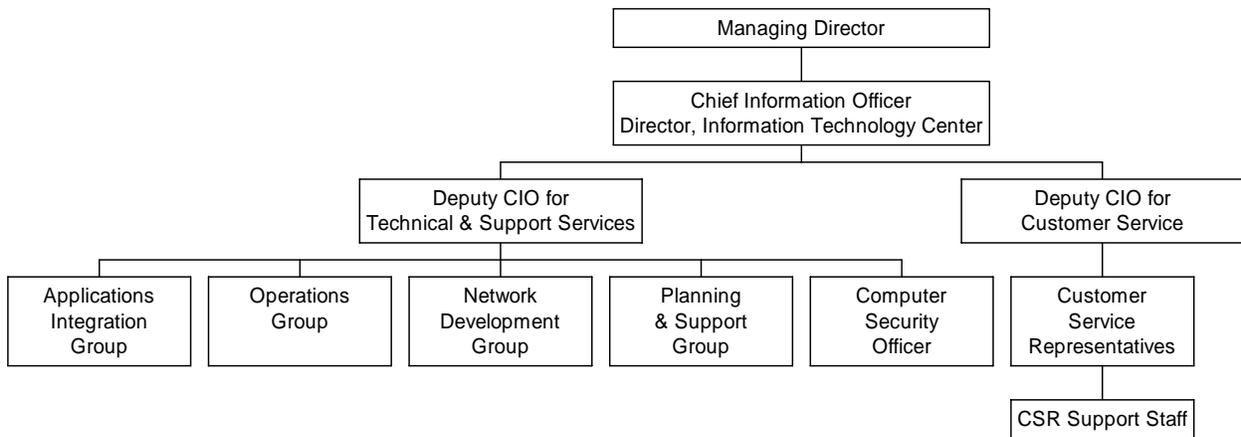
“Agencies must document and submit their initial [Enterprise Architecture] to OMB. Agencies must submit updates when significant changes to the Enterprise Architecture occur.” (section 8.b.(2))

# 2

## IT Organization and Mission

The Federal Communications Commission is an independent regulatory commission. It is composed of a Chairman and four other Commissioners, who are appointed by the President with the advice and consent of the Senate. The FCC regulates interstate communications by radio and wire. The Communications Act of 1934, as amended, is the primary law defining the Commission’s structure and functions. The Commission staff is organized into Bureaus and Offices, as set forth in 47 CFR §0.1 *et seq.*

In accordance with the Paperwork Reduction Act, the FCC has designated a Chief Information Officer (CIO).<sup>1</sup> The CIO reports to the Managing Director, who serves as the Commission’s chief operating and executive official, under the supervision and direction of the Chairman. (47 CFR §0.11(a)) Figure 2-1 shows the organization of Information Technology staff at FCC.



**Figure 2-1: Organization of Information Technology Staff at FCC**

<sup>1</sup> *FCC Organization Manual*, Office of Managing Director, effective September 24, 2000

The Information Technology Center (ITC) is the organization in the FCC that develops and executes the Information Technology Strategic Plan. The ITC provides resources, support and oversight to “system owners” within the Bureaus and Offices. The ITC plans, sets policy and advises on all aspects of IT. It consists of the following components:

- **Chief Information Officer:** The Director of the Information Technology Center is the FCC’s Chief Information Officer. He manages the IT program and is the senior IT advisor to the Managing Director, the Chairman and the Commission.
- **Deputy CIO for Technical and Support Services:** The Deputy CIO for Technical and Support Services supervises the four operating groups in ITC and the Computer Security Officer.
- **Deputy CIO for Customer Service:** The Deputy CIO for Customer Service supervises the Customer Service Representatives and the CSR Support Staff.
- **Customer Service Representatives:** The CSRs are the liaison between ITC and the Bureaus and Offices. The CSRs consult, advise, support, and resolve problems for end users in the Bureaus and Offices. They also oversee and coordinate the design, acquisition, installation, operation, maintenance and evaluation of IT initiatives.
- **CSR Support Staff:** The CSR support staff provides administrative support to CSRs.
- **Applications Integration Group:** The AIG oversees application and database development and maintenance. They are the central data administrators, and provide database, client-server, and web-based integration and maintenance. AIG also oversees agency-wide programming support contracts for database development.
- **Operations Group:** The OG is the contact point for day-to-day desktop-related requests and problems—reviewing, evaluating and, whenever possible, approving Bureau and Office requests for day-to-day IT services. The Operations Group also oversees the Help Desk, training, network operations, and telecommunications contracts.
- **Network Development Group:** The NDG develops, installs and integrates new telecommunications services, central computer site hardware, and operating system facilities. It also provides advanced computing consulting, product development, and technical expertise in IT network and special applications.
- **Planning and Support Group:** The PSG performs planning and performance measurement for Commission-wide information technology services and initiatives. They manage the formulation and execution of ITC’s annual budget, and the procurement of hardware, software and information services.
- **Computer Security Officer:** The Computer Security Officer leads FCC’s computer security program.

3

## IT Goals and Objectives

### 3.1 Overview

This section presents the FCC's Information Technology goals, and their subsidiary objectives. Appendix B presents potential strategies for achieving these goals and objectives that were developed through group working sessions.

**Goal 1: External Focus**

*Implement customer-focused IT solutions to facilitate information exchange with the public and telecommunications industries.*

IT systems should make it easy for members of the public to learn how to pursue their concerns with the Commission, whether they wish to apply for a license, comment on a regulatory issue, apply for a job, or conduct any other business. IT systems should give the public direct access to FCC's documents and data that are intended to be available to the public. Persons who are required to file information with the FCC should have the option of submitting it electronically, as an alternative to paper. IT systems which the public access directly should be available 24 hours a day, 7 days a week, allowing for brief scheduled maintenance periods. IT systems will be accessible to people with disabilities.

**Objective 1: Evolve FCC systems to respond quickly to industry and regulatory changes.**

The FCC's industry clientele must deal with the fast-paced nature of their respective, highly competitive fields. The rapid changes in the telecommunication industry, including convergence and ongoing changes in technology, requires that the FCC provide an IT environment that can respond quickly to meet the needs of both internal and external customers. This customer-focused environment requires that interfaces to appropriate mission applications be made available to the public to facilitate customer service and business process improvements.

**Objective 2: Provide electronic filing in all cases where it is practicable.**

The Government Paperwork Elimination Act requires Federal agencies, by October 21, 2003, to allow the option to submit information or transact with the agency electronically, when practicable. The FCC will develop a common IT solution for electronic filing, so that common tools and architecture can be made available to the Bureaus and Offices to facilitate their accomplishment of this objective. Electronic filing also addresses the requirements of document storage as defined by the National Archives and Records Administration.

**Objective 3: Provide public access to FCC systems, information and customer service 24 hours a day, 7 days a week.**

The FCC will provide the products and services necessary for the public to access FCC data, primarily through the Internet, but also via other means as required by regulation or as deemed appropriate. We will support an IT architecture that enables external constituents to conduct FCC-related business, via electronic means, on a 24-hour, 7 day a week basis. To support this effort, it will be necessary to communicate planned system downtimes (for upgrades and backups) as well as provide system status information via recognized industry standards.

**Continue to improve the FCC web site.** The FCC's Internet web site is a "front door" for members of the public who want to pursue their concerns with the Commission. We should continue to make it easier to use, capable of retrieving more of the FCC's information, and capable of performing more of the transactions that occur between FCC and the public. As of the third quarter of FY 2001, we are starting to implement the recommendations of a recent web evaluation study, including a standard format for all our web pages and a better search capability. The next step will be to re-evaluate the web site to identify additional information and functions that would be valuable to the public.

**Goal 2: Internal Focus**

*Provide the IT infrastructure and productivity tools to enhance FCC staff's ability to execute their statutory responsibilities and mission.*

Information Technology is the tool for most of the jobs we do at the FCC. Our IT systems must respond to the preferences of the end-users, who are our internal customers. But our IT systems are also a tool for the FCC leadership to shape work processes and to improve the quality and consistency of work products.

**Objective 1: Provide a common IT infrastructure for developing common solutions, while meeting specialized needs.**

We will develop common IT solutions to improve agency efficiency and customer service. This includes developing a common architectural infrastructure to enable development of common solutions. But the purpose of common IT solutions is to meet the needs of FCC's Bureaus and Offices, so we must remain flexible to meet special needs, even when that requires a novel solution.

Several aspects of this objective have been identified for immediate action. We will leverage IT to improve staff effectiveness. We will expand remote access and improve synchronization with personal mobile devices. We will establish expertise in MS Office desktop software throughout the Bureaus and Offices.

**Objective 2: Provide venues and opportunities for sharing information.**

We will provide venues and opportunities for sharing information so as to improve the overall IT program. Potential topics include project coordination, IT programs, technology trends and advancements, standards and products, use and capabilities of mission systems, electronically available data, and the business functions and processes of the Bureaus and Offices. The intent is to provide opportunities to share problems, approaches to solutions, and project-related "lessons learned." This objective also includes sharing databases and software.

**Objective 3: Establish and maintain defined processing and communications service levels.**

We will establish service level support agreements for the services that the Information Technology Center provides to the Bureaus and Offices, such as system/network administration and availability, help desk support, and general problem tracking and resolution. We will document existing procedures and make the documentation accessible to the appropriate staff and their designated alternates.

**Objective 4: Provide technical solutions that improve data management.**

We will evaluate the existing data storage and collection systems and procedures, in comparison to industry best practices, and we will identify possible improvements and technical solutions. We will consider issues related to document management, and identify possible technical solutions. The efficiency of existing database servers shall be evaluated, and consolidation of database servers shall be investigated.

**Goal 3: Technology Leadership**

*Provide innovative, responsible, flexible leadership to ensure successful FCC IT programs.*

Customer service is the hallmark of the FCC IT program. We will develop policies and procedures as needed, improve program management, and adhere to the best practices of industry by using our System Development Life Cycle (SDLC) methodology. We will continually refresh our technology. We will facilitate the integration of new systems, including proper training for end-users.

**Objective 1: Clearly identify roles and responsibilities, and build expertise to support IT programs.**

The IT program needs to clearly communicate the responsibility of the CIO and ITC staff, and address the IT-related roles of the Bureau and Office staffs. Coordination of IT functions, including new initiatives, shall occur between the ITC and the Bureaus and Offices in every phase of project development and support. We will develop procedures for architectural approvals, reviews, and waivers.

We will provide in-house technical training and cross-training for IT technologies to build staff expertise in support of FCC's IT programs. This training shall focus on both existing and emerging technologies.

**Objective 2: Define, use and maintain an IT architecture.**

We will bring the FCC's IT architecture closer to our target IT architecture as defined in Section 6. We will use the Technical Reference Model defined in Section 4, and the standards it identifies, to guide the development of new and updated systems towards our target architecture.

The Information Technology Center will support a core suite of development tools and application suites that comply with the standards identified in our Technical Reference Model. We will re-evaluate our target IT architecture, and our development tools, periodically as part of the technology refresh program.

**Data and Systems Integration.** Moving towards the target architecture includes identifying opportunities to integrate separate FCC databases and systems. Where integration is appropriate, it can increase internal productivity, provide additional information in a more logical format to FCC external customers, and reduce information systems maintenance. One expected result of this initiative will be the simplification of business transactions with FCC customers. We have initiated a project to identify opportunities for integration, and we expect to complete the first phase of this project by mid-FY 2002.

**Objective 3: Provide detailed guidance and proactive controls.**

The Information Technology Center will provide guidance for capital planning, enterprise infrastructure, development planning, and administration of all IT assets. Our guidance will provide for control of IT investments throughout the SDLC, including evaluation of each system placed in production, to determine whether it should be continued, further developed, modified, or terminated. This approach will satisfy the requirements of the Clinger-Cohen Act. We will provide proactive controls, including configuration management, capacity planning, performance monitoring, and contingency planning. We will evaluate all planning activities from the perspective of providing continuity of operations.

**Objective 4: Continually assess new technologies.**

The ITC, in conjunction with the Bureaus and Offices, will continually evaluate new and emerging technologies. New technologies may be incorporated into the enterprise provided they show a positive cost/benefit and performance return.

**Objective 5: Ensure compliance with accessibility requirements.**

Leadership shall be provided to ensure that FCC systems comply with the accessibility requirements as stated in Section 508 of the Rehabilitation Act (29 U.S.C. § 794d). Special consideration shall be given to reach the stated objective of June 21, 2001 (or subsequent revision) for compliance with Section 508.

**Objective 6: Enforce IT security.**

Proper security measures include assessing security risks and protecting the IT architecture and end-users from malicious intent. Toward that end, we will provide the support tools and services to detect any security breaches or attempts. We will maintain policies and procedures for responding to security breaches, or potential security threats. We will design and deploy the IT infrastructure and business applications to protect the Commission's data. We will provide training for system users concerning FCC-related security issues.

### 3.2 Mapping IT Goals to FCC Strategic Goals

Table 3-1 shows how the Information Technology goals relate to the FCC’s strategic goals.<sup>2</sup>

**FCC INFORMATION TECHNOLOGY GOALS**

FCC STRATEGIC GOALS	External Focus: Implement customer-focused IT solutions to facilitate information exchange with the public and telecommunications industries.	Internal Focus: Provide the IT infrastructure and productivity tools to enhance FCC staff’s ability to execute their statutory responsibilities and mission.	Technology Leadership: Provide innovative, responsible, flexible leadership to ensure successful FCC IT programs.
Create a more efficient, effective and responsive agency.	✓	✓	✓
Promote competition in all telecommunications markets.	✓	✓	
Promote opportunities for all Americans to benefit from the communications revolution.	✓		✓
Manage the electromagnetic spectrum in the public interest.	✓	✓	

**Table 3-1: Mapping FCC Strategic Goals to Information Technology Goals**

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<sup>2</sup> The FCC Strategic Goals are from FCC’s FY 2003 Budget Estimates, submitted to Congress in April 2001.

# 4

## FCC Technical Reference Model

### 4.1 Overview

The Technical Reference Model (TRM) is a conceptual framework for presenting the baseline and target architectures. The TRM is built on a foundation of IT infrastructures that support a series of IT services (e.g., Platform Services or Office Automation Services). The IT services map to the Standards Profile, a specification of FCC-accepted standards. These standards support all FCC mission applications. Figure 4-1 illustrates this framework.

This section defines the infrastructures and services of the TRM. Section 5, FCC Baseline Architecture, and Section 6, FCC Target Architecture, describe the FCC's IT landscape in terms of the TRM's infrastructures, services, and standards profile. The baseline shows where the Commission is today. The target shows the direction in which the Commission is headed.

### 4.2 Infrastructures and Services

The TRM is built on a three layered infrastructures: the information infrastructure, the communication infrastructure, and the processing infrastructure. A fourth infrastructure, security, provides crosscutting services that span and protect the other three.

These four infrastructures are the foundation for the TRM's core services. Each service provides specific functionality and is backed by a set of standards. The core of each service supports one of the four infrastructures, but the elements of a service may branch out to peripherally support the other infrastructures. The services are explained in the following sections, grouped by the infrastructure that each primarily supports.

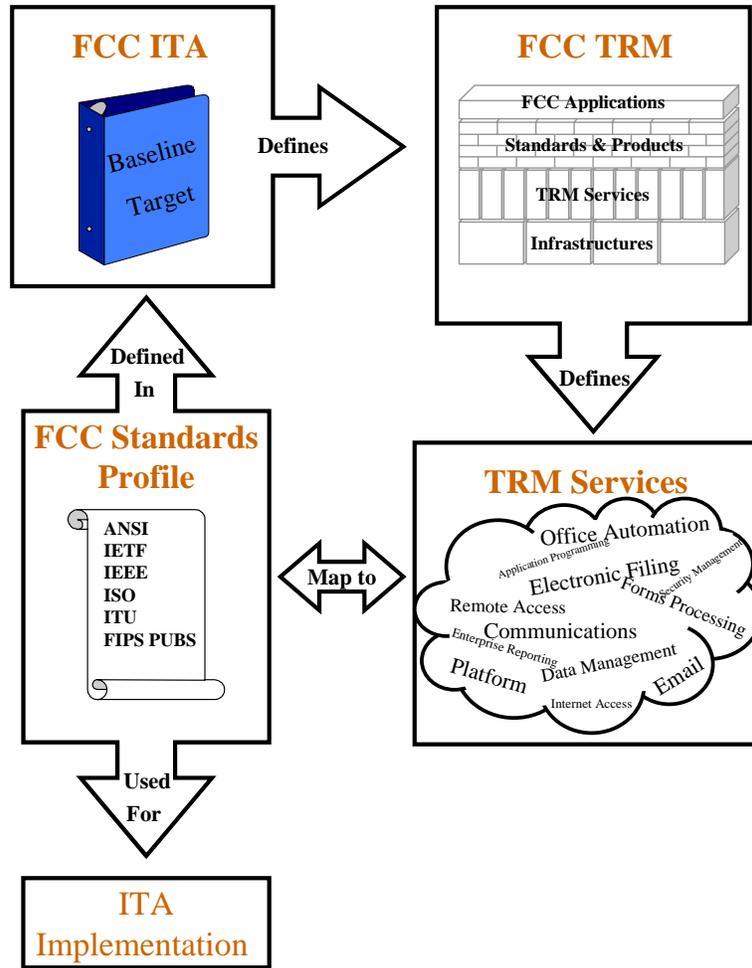


Figure 4-1: FCC Information Technology Architecture (ITA) Framework

### 4.2.1 The Information Infrastructure

The information generated and used in FCC’s information technology systems is an important aspect of the architecture. This information base, taken as a whole, represents the Commission’s information infrastructure.

The information infrastructure characterizes the type of information used within the Commission: it shows who needs the information and how it is generated, accessed, and maintained. It defines data, models data relationships, facilitates storage and retrieval of data, and describes the constraints on the use of data. This knowledge is then used to develop a technology strategy for efficiently managing the needed data.

The information infrastructure is supported by the Commission’s suite of application servers and it provides value through its use of common data format and exchange

standards. Well-defined data and data relationships are essential to a secure and interoperable information infrastructure.

Services that support the information infrastructure include data sharing and administration services, enterprise reporting services, and electronic mail services.

#### **4.2.1.1 Data Sharing and Administration Services**

Data sharing and administration services provide FCC users and applications the means to retrieve, view, and compare data. They also provide the ITC the ability to administer, store, and backup information generated and used by the FCC. Data sharing and administration services include directory services that support electronic mail, digital certificates, and other applications that rely on directory information.

#### **4.2.1.2 Enterprise Management Services**

Enterprise management services support the Commission by providing network management, network administration, and enterprise reporting. Enterprise management services assist system owners, Bureau Chiefs, Assistant Bureau Chiefs and other decision-makers by collecting and accurately reporting information. That information can in turn be used by the ITC to proactively manage FCC networks. Enterprise management also incorporates the environmental services (e.g., power requirements, facility space) needed to support automated systems.

#### **4.2.1.3 Electronic Mail Services**

Electronic mail services provide reliable and secure electronic mail capability to users and applications at FCC. Electronic mail is provided to all FCC users independent of location (headquarters, field offices, or telecommuters). Access for remote users currently requires installation of the e-mail application's client on the user's workstation and a dial-up connection. Electronic mail services could also be provided via Internet access (requiring only the web browser) for e-mail access in the future.

## 4.2.2 The Communication Infrastructure

The communication infrastructure provides the connectivity that allows the FCC to share information with its internal and external constituents. The communication infrastructure uses standard protocols to facilitate data exchange. It consists of the data communication equipment, software, and networks that link computers and peripherals within and between offices. The communication infrastructure provides:

- Pipelines for information movement
- Management of pipelines
- Protocols for information movement
- Mechanisms for information movement through pipelines
- Mechanisms for detecting network faults and failures
- Mechanisms for linking with other networks

The communication infrastructure is designed in the context of three functional objectives:

- **Connectivity:** It must be able to interface with current and anticipated processing equipment within the Commission.
- **Interoperability:** It must permit hardware from competing vendors to communicate—implementing an open system design that allows flexibility.
- **Scalability:** It must be configurable to support the required range of user community sizes and traffic requirements.

Services that support the communications infrastructure include communication services, remote access services, Internet access (portal) services, and collaboration services.

### 4.2.2.1 Communications Services

The communications services support interactions among users, applications, and data.

The communication services provide the capability to:

- Send, receive, forward, and manage electronic information—both data and voice—and provide real-time information exchange services
- Transfer data between systems and applications

- Send, receive, forward, store, display, and manage individual and organizational messages, including voice messages
- Support two-way video transmission between Headquarters and field offices
- Allow groups of people to communicate, collaborate, and participate in conferences via computer workstations

#### **4.2.2.2 Remote Access Services**

Remote access services support telecommuters and field personnel. These services enable remote users to have secure, high-speed access to FCC platforms and office automation services. Remote access services will continue to support new needs for remote access as they arise. For example:

- As telecommuting increases, remote users may require expanded access to FCC files and applications.
- As Personal Digital Assistants (PDAs) and handheld wireless devices become more prevalent, remote access users (e.g., enforcement personnel) may require connectivity to the FCC Local Area Network (LAN) through these devices.

#### **4.2.2.3 Internet Access (Portal) Services**

Internet access services provide the public with a common and unified gateway (portal) to access FCC information. Web-enabled applications for electronic filing, conducting industry research, filing complaints, and required reporting use these services. Internet access services will also provide the capability to expand and web-enable e-mail access and other applications for remote users and telecommuters.

**Collaboration Services.** Collaboration services provide the tools to enable individuals and groups to communicate and work together in either synchronous or asynchronous settings through techniques like shared white boards, audio conferencing, video conferencing, instant messaging, and shared applications.

### **4.2.3 The Processing Infrastructure**

The processing infrastructure supports the information and communication infrastructures by providing the computer systems and software necessary to support the Commission's business needs. The processing infrastructure provides mechanisms for:

- Moving information
- Managing user interfaces
- Managing office automation software
- Managing application development and integration
- Managing processing hardware and software
- Managing system processes
- Controlling system usage

Services that support the processing infrastructure include platform services, office automation services, data management services, application programming and integration services, electronic filing services, workflow and document management services, and forms processing services.

#### **4.2.3.1 Platform Services**

Platform services at the FCC include operating system services, user interface services, and file system services. Operating system services provide the core capabilities needed to operate and administer the office automation platforms and the Bureau and Office mission application platforms, and to provide an interface between the platform and the application software. User interface services provide for the human-computer interface that supports the use of a desktop environment. File system services provide the infrastructure needed to create, store, move, and share all types of electronic files.

#### **4.2.3.2 Office Automation Services**

Office automation services provide common end-user applications support functions such as word processing, graphics, and spreadsheets.

#### **4.2.3.3 Data Management Services**

Data management services provide database management systems and utility services to users and applications to query, retrieve, organize, and manipulate data. Data management services also provide Bureaus and Offices the capability to develop and administer databases.

#### **4.2.3.4 Application Programming and Integration Services**

Application programming and integration services provide the infrastructure and tools to develop new applications that can be integrated with existing systems. Application development suites, distributed application technologies, and other middleware technologies are included in these services. As common solutions become more prevalent at FCC, development and integration of distributed applications will gain importance.

#### **4.2.3.5 Electronic Filing Services**

Electronic filing services provide the infrastructure and interfaces for constituents to submit licensing and other required information to the FCC electronically. These include, but are not limited to, electronic file transfers (upload/download), electronic mail submissions, custom filing applications, and Commercial off-the-Shelf (COTS) electronic forms/filing products. There are currently 18 web-enabled electronic filing applications at the FCC that the public can use to apply for and renew various communications-related licenses, file comments and complaints, and request industry-related information.

#### **4.2.3.6 Workflow and Document Management Services**

Workflow and document management services support users and applications in creating, storing, routing, retrieving, collaborating on, and reviewing both electronic and paper documents. For example, these services provide the following capabilities:

- Routing, reviewing, and approving documents
- Collaboration and version control for the SDLC and system documentation
- Distribution and sign-off on policies and procedures.

### **4.2.3.7 Forms Processing Services**

Forms processing services provide forms processing functionality for activities such as making helpdesk requests and human resources-related activities (e.g., facilities requests, travel reimbursements). These may be integrated with workflow and document management services. They also support external customers for licensing activities and information requests. Forms processing services provide:

- Electronic and online forms
- Automation and minimization of data entry using electronic data retrieval and Optical Character Recognition (OCR) scanning
- A Commission-wide forms repository and access point
- Flexibility in the types of forms that can be used
- Flexibility in how the data that is collected from forms can be used

## **4.2.4 The Security Infrastructure**

IT security covers a broad spectrum of operational and policy issues. The IT security services comprise the requirements, policies, and practices to secure information. The security infrastructure:

- Safeguards resources
- Supervises resource sharing
- Ensures resource availability to authorized users
- Ensures denial of service to unauthorized users
- Detects and reports intrusion attempts by unauthorized users

A fundamental prerequisite to information sharing is trust between parties and an agreement on access and protection mechanisms. Given an understanding between system owners and their constituents at the policy and practice levels, an IT architecture can be implemented in which trust and secure interoperability are established.

Services that support the security infrastructure include security management and administration services.

### **4.2.4.1 Security Management and Administration Services**

The security management and administration services assist in protecting information and computer platform resources. These services include support for:

- Maintaining the integrity of platforms, systems, and stored data
- Identifying and authenticating individual users and interconnected systems
- Controlling authorized access to systems and information
- Ensuring confidentiality of data and information assigned to or used by legitimate users or systems
- Issuing digital certificates to authorized users for digital signature capabilities
- Providing audit trails
- Ensuring the availability (as appropriate) of platforms, systems, data, and information to legitimate users

#### **4.2.4.2 FCC TRM Standards Profile**

The TRM standards profile is a collection of standards to be used within the FCC IT environment. It is composed of two lists—a baseline standards profile and a target standards profile.

The baseline standards profile was developed from existing documentation and interviews with system owners. The target standards profile was developed in working groups with FCC staff. Presenting the baseline and the target using the TRM as a model provides a consistent viewpoint of the two architectures. Gaps and deficiencies are easily identifiable, making the task of creating a roadmap for getting from the baseline to the target less daunting. The baseline and target standards profiles are presented in Sections 5 and 6, respectively.

5

## FCC Baseline Architecture

### 5.1 Overview

The baseline architecture describes the current information systems and applications used within the Commission. In describing the current information technology environment of the FCC, the baseline provides a snapshot of the technology infrastructure, business applications, and support elements as of March 2001. The description identifies the range of automation systems, environments, and assets in use across the FCC. The description also includes technical summaries of the FCC's hardware, COTS software, network and support services elements, and applications, including mission critical systems.

The FCC IT Architecture follows guidelines set forth in OMB Memorandum 97-16 and addresses the principles and guidelines in the Federal CIO Council's Federal Enterprise Architecture Framework.

### 5.2 Overview of Current Information Technology Environment

The FCC's IT environment offers a wide range of shared services to FCC staff and external customers. Based on a client/server architecture, the network integrates and allows PC desktop access to virtually all Commission data systems. A detailed description of the specific hardware and software in use in the FCC IT environment is provided throughout this section. This section is a snapshot of the IT environment as of March 2001.

The FCC uses a wide range of commercially available software products. The commercial products mentioned in subsequent subsections, which discuss the platforms and their applications, are those for which the FCC has made specific license agreements, supports as "standards," or those that have been identified as the most popular among the Bureaus and Offices.

The FCC-specific applications used within this environment are generally tied to a particular Bureau or Office. The major FCC-sponsored applications, and the Bureau or Office that developed them, are shown in Exhibit 5-1, FCC Baseline Applications, and discussed further in Section 5.3, FCC Baseline Applications. (**Note:** Bureau/Office names do not reflect reorganization of March 2002) This list reflects automated systems for which the FCC is responsible. It does not include pilot/prototype systems, small local Bureau or Office applications, or external systems used by the FCC (such as the Federal Financial System or payroll system).

Bureau or Office	Application Name (Acronym)
CCB	Automated Reporting Management Information System (ARMIS) Electronic Tariff Filing System (ETFS)
CIB	Electronic Comments Filing System (ECFS) Expert Adviser Integrated Voice Response (IVR) Operations Support for Complaints Analysis Resolution (OSCAR)
CSB	Cable Operations and Licensing System (COALS) Cable Tracking System (CTS) Price Survey
IB	Canadian Co-channel Serial Coordination System (COSER) International Bureau Filing System (IBFS)
MMB	Broadband Licensing System (BLS) Call Sign Reservation and Authorization System (CSRS) Children's Television Reporting System (KidVid) Consolidated Database System (CDBS)
OET	Equipment Authorization System (EAS) Equipment Authorization System / Telecommunications Certification Bodies (EAS / TCB) Experimental Licensing System (ELS)
OGC	Case Tracking System
OLIA	Automated Correspondence Management System (ACMS)
OMD	Chairman's Lifecycle Agenda System (CLASPlus) Collections Commission Registration System (CORES) Cost Reporting System (CRS) Electronic Document Management System (EDOCS) General Menu Reports (GENMEN) Management Tracking System (MTS) Procurement Desktop (IDEAS-PD) Remittance Over Secure Internet E-Commerce (ROSIE) Revenue Accounting Management Information System (RAMIS)
WTB	Auctions Automated System (AAS) Auctions Expenditure Tracking System (AETS) Universal Licensing System (ULS)

**Exhibit 5-1. FCC Baseline Applications**

### 5.2.1 The Information Infrastructure

The information infrastructure characterizes the type of information used within the Commission. In the context of the TRM, the information infrastructure is particularly concerned with how electronic data and files are used and managed. This knowledge is then used to develop a technology strategy for efficiently managing the needed data.

The information infrastructure is supported by the Commission's suite of application servers and it provides value through its use of common data format and exchange standards. Well-defined data and data relationships are essential to a secure and interoperable information infrastructure.

## **5.2.2 Data Sharing and Administration Services**

The Operations Group (OG) of the Information Technology Center is responsible for the management and backup of file and print servers (including specialty servers such as the e-mail and authentication servers), most of which are located in the FCC Computer Room. OG also manages the file server supporting the Office of Engineering and Technology (OET) Laboratory, with file server backup performed by OET staff. OG also backs up all database servers located in the FCC Computer Room in the Portals building in Washington, D.C., and those in Gettysburg, Pennsylvania.

The Applications Integration Group of the Information Technology Center is responsible for the management, excluding backups, of all database servers in the FCC Computer Room, the OET Laboratory, and Gettysburg.

The Auctions Group of the Wireless Telecommunications Bureau is responsible for the total management, including backups, of all file and database servers in the Auctions computer room in the Portals building.

The software used within the Commission for data sharing and administration services includes: Veritas Volume Manager 2.6, ArcServe 6.6, Backup Agent for Open Files 6.6, NDS 6.03, Adobe Acrobat, WestLaw v7.2, Real Player 7, CompareRite v7.0, and Lexis-Nexis.

### **5.2.2.1 Enterprise Management Services**

FCC uses ManageWise for network management system monitoring. Clear Access and Softrack 5.30b are also used within the Commission to support enterprise management services.

### **5.2.2.2 Electronic Mail Services**

Electronic mail is provided to FCC users independent of location (headquarters, field offices, or telecommuters). GroupWise has been in use within the FCC for the past eight years and has an average 99.87 percent availability for the past year. Access for remote users currently requires installation of the e-mail application's client on the user's workstation and a dial-up connection.

The products used within the Commission to provide electronic mail services include: Lotus Notes, Domino Server 4.6.5, GroupWise Client 5.5, GroupWise Gateway API 4.1. We have decided to migrate from GroupWise to Microsoft Outlook, and the transition is expected to begin in FY 2002.

### 5.2.3 The Communication Infrastructure

The communication infrastructure provides the connectivity that allows the FCC to share information with its internal and external constituents. The data communications environment providing local and wide area network system connectivity and the voice communications infrastructure within the FCC is described below. The communications software, in conjunction with particular hardware devices, provides the needed connectivity among hosts, servers, and PCs.

Exhibit 5-2, Overview of the FCC’s Current Systems Environment, presents an overview of the Commission’s network infrastructure. This schematic is a high-level snapshot of the FCC-wide environment. While not specifically detailed, the remote locations typically have a similar hardware (server) infrastructure as shown for the Portals.

Throughout the FCC, even down to the field offices, there are very few configuration variations, with the exception of the Auctions-related IT environment. As a result, the automation capabilities found throughout the FCC are relatively homogeneous.

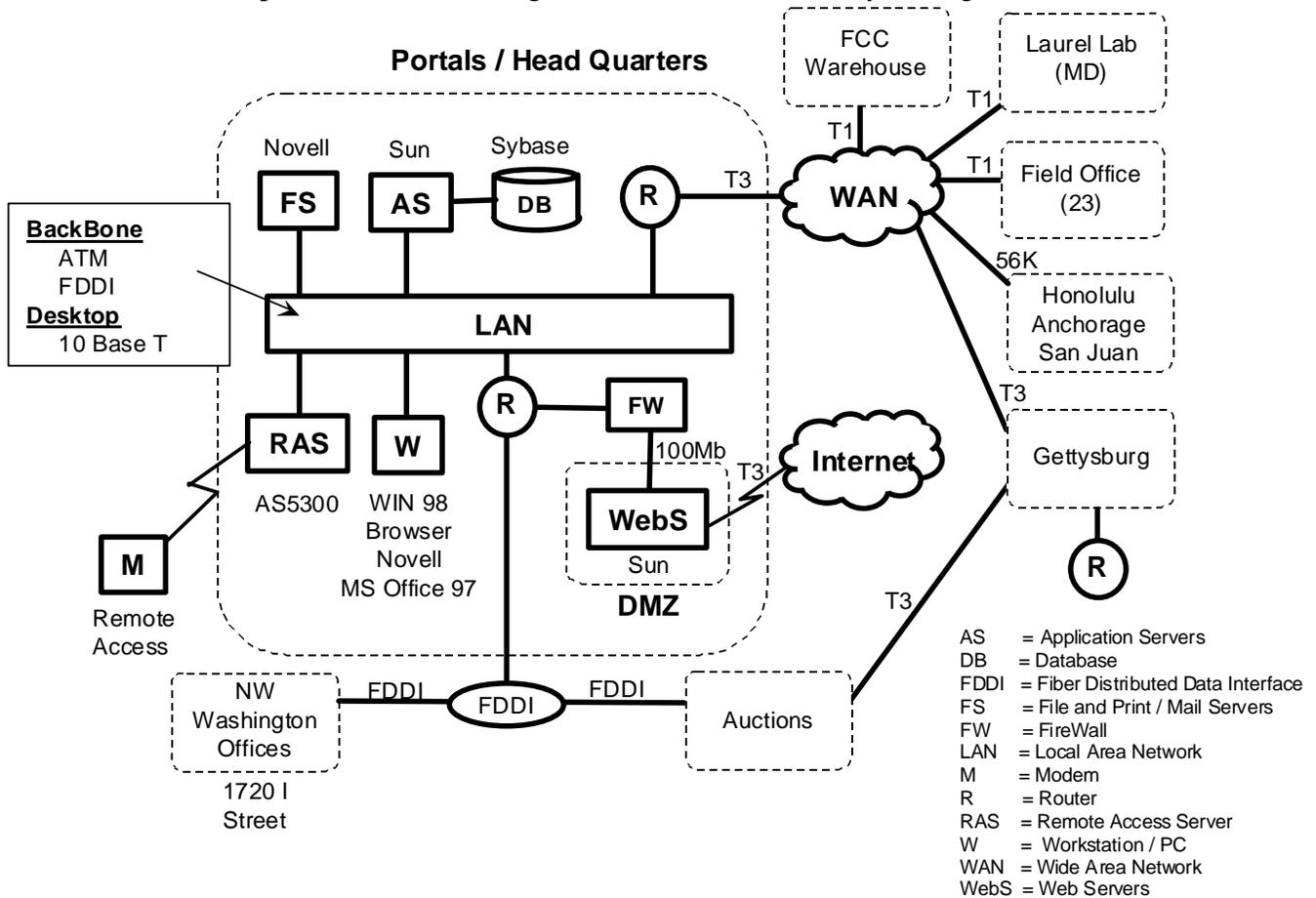


Exhibit 5-2. Overview of the FCC’s Current Systems Environment

### **5.2.3.1 Communications Services**

The FCC's network uses a combination of router and switch technologies. The backbone utilizes ATM technology to provide speeds of up to 155 megabits per second (Mbps). Connections to the desktop are through a switched Ethernet technology providing speeds of either 10 or 100 Mbps. LAN traffic is typical of an office automation environment, however no formal traffic monitoring is performed. Novell Client 32 is the networking software employed within the FCC network.

Each floor has three wiring closets with a Cisco Catalyst 5500 switch in each closet and approximately 100 users attached to each switch. The wiring closet Cisco Catalyst 5500 switches connect directly to four Cisco Catalyst Lightstream 1010s via the ATM backbone. The four Lightstream 1010s then feed into two Cisco Catalyst 5500/Lightstream 1010s. The two Catalyst 5500/Lightstream 1010s are connected to two Cisco 7505 routers.

For voice communications, the FCC uses Integrated Services Digital Network (ISDN)/Centrex service. ISDN lines are also installed at many field offices, but rates in the field are two to three times the rates at Headquarters. Due to the price variation, the field offices may move to an alternative technology, which could be managed from Headquarters. In the next five to six years voice over IP may be an option, but currently it is not considered to be reliable enough to meet FCC's needs.

The Auctions group has a completely separate network and telephone system. They use Microsoft Windows NT as the operating system and Fiber Distributed Data Interface (FDDI) to interface to the FCC Portals LAN. Auctions connects to the major license processing center and national call center located in Gettysburg, PA, via T-3 circuits. The Headquarters infrastructure needs to remain open to the Auction infrastructure. The northwest Washington facility also uses FDDI to interface with the FCC Portals LAN.

### **5.2.3.2 Remote Access Services**

The FCC network extends beyond the Headquarters to a Wide Area Network (WAN) that connects over 20 field offices throughout the U.S. and Puerto Rico. The WAN is "spoke" topology with connections from Headquarters to the field offices. The Commission uses frame relay and router technologies for connectivity to these offices. Field office equipment configurations are similar to those within the headquarters, but with smaller capacities, all connected to a server at headquarters.

There are T1/Frame Relay connections for all resident agent and field offices except Honolulu, Anchorage and San Juan, which have 56 kilo-bits per second (Kbps) point-to-point circuits. The Laurel Lab, in Columbia, Maryland, and FCC Warehouse facility use T1 connections.

Two Cisco AS5300 Remote Access Servers provide a combined capacity of 276 analog connections for users to dial in. Users can download and read mail and connect to the

Internet, and some have the ability to access files located on servers. Dial-in remote access service provides access to electronic mail, Internet, and Intranet, but requires the GroupWise electronic mail client be loaded locally.

### **5.2.3.3 Internet Access (Portal) Services**

Internet access services provide the public with a common and unified gateway, or portal, to access FCC information.

For web-based applications, the FCC standard is a Hypertext Transfer Protocol (HTTP) Server running iPlanet Web Server 4.1. The Commission's browser standards are Internet Explorer (4.0) and Netscape Communicator (4.75). The Network Development Group of the Information Technology Center is responsible for the management (including backups, where appropriate) of the Commission's Internet, firewall, Altos systems, and various specialized servers including the Infoserver, list server, and various Dynamic Host Configuration Protocol (DHCP) servers.

### **5.2.3.4 Collaboration Services**

Collaboration services provide the tools to enable individuals and groups to communicate and work together using advanced electronic techniques. Currently there are no standard products in use throughout the Commission.

## **5.2.4 The Processing Infrastructure**

The headquarters facility contains more than 2,300 personal computers (PCs), while there are approximately 580 PCs in the field office locations including the OET Laboratory and the Gettysburg facility. The PC hardware and software used within the FCC to provide desktop processing and office automation services are Intel-based. Standard desktop hardware configuration and approved software that can be purchased by FCC personnel are defined in the FCC's Purchase Card Program. A technology refreshment program has also been established to replace outdated IT equipment within the FCC. The following documents, detailing this and other information, can be found in Appendix C:

- FCC IT Lifecycle Management Program (FY 2000)
- FCC PC and Software Inventory (8/31/2000)
- IT Standards for Purchase Card Acquisitions (11/2000)
- Current FCC Desktop Computer Purchase Specifications (minimum requirements) (9/2000)
- Current FCC Notebook Computer Purchase Specification (minimum requirements) (9/2000)
- FCC supported Desktop Software (11/2000)

The FCC intends to add software package support in the system design, software/configuration management, release and version control, and documentation generation areas as suitable products are found and purchased. The Commission attempts to run the latest versions of desktop software, and when unable, runs no further than one version behind the latest version available.

#### **5.2.4.1 Platform Services**

The server hardware and software owned, maintained, and operated by the FCC are both SunSparc/Unix and Intel/NetWare based. Unix-based systems provide the platform for web and mission application servers, while NetWare-based systems provide the platform for mail, file, and print services. The FCC intends to refresh or upgrade database software tools and server hardware as circumstances warrant.

The file and print and mail servers are all Hewlett-Packard NetServers. Five main servers provide file and print services to FCC users. Each server is a 200 MHz Pentium Pro processor with 1 gigabyte of memory and 104 gigabytes of usable disk space. Mail service is provided through five mail file and print servers, plus there are five additional servers fully dedicated to mail. The file and print/mail servers within the FCC use the Novell operating system. Commission standard versions of Novell components include Novell NetWare 4.11, Novell Directory Services (NDS 6.03), Novell Application Launcher (NAL 2.7). There are 10 to 12 “specialty” servers running NetWare 3.11/3.12 and 4.11 that are used to provide miscellaneous services. A number of servers will be protected with Redundant Array of Inexpensive Disks (RAID)-5 and a hot-swappable disk drive in the event of a failure as of March 2001. The overall Novell server uptime is currently 99.91 percent. The uptime goal is 99.9 percent from 7:00 a.m. to 7:00 p.m., Monday through Friday.

The FCC has approximately 60 Sun application servers hosting Bureau and Office mission applications and databases. Approximately 50 of these Sun servers use the Sybase relational database management system (RDBMS); the remainder use Oracle RDBMS. Internet applications connect to the FCC via several Internet Application Servers. These servers are Sun1000/1000E servers with two new Sun 450s soon to be installed as replacements for older servers. The FCC would like to move toward a more unified approach, consolidating Unix-based servers and services using fewer, but larger, systems and network-attached storage. The benefits would lie in reduced labor to support and administer the systems and better availability/up-time.

The laboratories in Columbia, MD and the Gettysburg, PA facilities each have one file and print server that provides services to personnel at that location. Comparable database servers are located at the laboratory and Gettysburg. In addition, the Gettysburg facility has several Microsoft Windows NT servers for specialized applications.

All desktop workstations are Intel-based, with Pentium processor speeds ranging from 133 MHz up to 933 MHz. The telecommuting program uses the low-end Pentiums (133's and 166's). Memory ranges from 32 megabytes to 256 megabytes. Disk capacity is from

4 gigabytes to 18 gigabytes. The operating system is Windows 98, running Novell's Client 32 to provide server connectivity. The recommended PC configuration (see Appendix C) is periodically updated to keep pace with technology and configurations offering better pricing/ performance. Headquarter facilities and field office PCs operate under Windows 98.

#### **5.2.4.2 Office Automation Services**

Microsoft Office Suite 98, which includes Access 98, Excel 98, PowerPoint 98, and Word 98, is the office automation suite used within the Commission. The FCC Office Computer User Suite (FOCUS) is the standardized desktop image loaded onto every FCC employee's PC. This image contains GroupWise, NAL, Win 98, Office 97, etc. With the exception of old legacy applications, all software is run from the desktop. Workstation and application program updates and in-house database applications are also executed through the NAL, as are software pushes (via Z.E.N.Works).

The field desktop is the same as that at Headquarters, but their updates are performed differently. CDs are prepared every month and sent out. The CDs, or "e-magazines," contain all software updates needed. This works better for the field offices than trying to push updates over the telecommunications link. There is also a CD for the FOCUS PC image.

#### **5.2.4.3 Data Management Services**

The majority of FCC applications employ the Sybase relational database management system (RDBMS) including the Sybase Adaptive Server v11.0.3.3 and Sybase Open Client v11.1.1 running on Sun servers using Solaris (currently version 2.6) as the operating system with Volume Manager (also version 2.6). The FCC has approximately 60 Sun application servers hosting Bureau and Office mission applications and databases. Approximately 50 of these Sun servers use the Sybase RDBMS; the remaining ones use the Oracle RDBMS.

The Applications Integration Group (AIG) strives to maintain highly available systems—duplication of servers outside the firewall, using RAID 5 disks, and using hardware configurations that support a better mean time between failure (MTBF). AIG support also includes performance analysis and problem resolution for database engines and database applications. Oracle 7 and Jaguar are also used for a smaller subset of applications.

#### **5.2.4.4 Application Programming and Integration Services**

The primary graphical user interface (GUI) tool is PowerBuilder 5 and 6.5, although other tools are permitted. The server-side scripting and programming languages in use include SilverStream (2.7), Cold Fusion, Actuate, Sun Java, CGI, Perl (5.0.04) and web.sql (1.1). Winrunner automated testing tool is also available.

For FCC production application or development projects, the FCC uses Cast Workbench (3.7). Cast Workbench assists in version control and release management. PVCS Version Manager version control software is also available.

#### **5.2.4.5 Electronic Filing Services**

Electronic filing services provide the infrastructure and interfaces for submitting information electronically. Although there are currently 18 web-enabled electronic filing applications at FCC, there are no standard products in use throughout the Commission.

**Workflow and Document Management Services.** Workflow and document management services support users and applications in creating, storing, routing, retrieving, collaborating on, and reviewing both electronic and paper documents. Currently there are no standard products in use throughout the Commission.

#### **5.2.4.6 Forms Processing Services**

Forms processing services provide forms processing for FCC activities. Currently there are no standard products in use throughout the Commission.

#### **5.2.4.7 The Security Infrastructure**

The security infrastructure is composed of the requirements, policies, and practices to secure information sharing.

#### **5.2.4.8 Security Management and Administration Services**

All initiatives go through an FCC security audit. The security audit checks source code for backdoors and thoroughly tests the system for integrity. The security staff, with contractor support, performs security certification and accreditation tests (per OMB Circular A-130). Systems can be provided temporary accreditation—allowing 160 days to resolve issues found during the security audit. Although there is no classified data (in the DoD sense), security is still an important requirement because the FCC does deal with business sensitive, personal/Privacy Act, financial sensitive, and other unclassified information.

There are three Gauntlet Firewalls separating the FCC's LAN from the Demilitarized Zone (DMZ). The DMZ contains the web application servers that the public can access. All applications in the DMZ go through strict initial review and continuous reviews to assess security. There is also a Cisco PIX firewall that is used to limit public access to the Reference Information Center's resources.

Command Software Anti Virus (CSAV) antivirus software designed for use with NetWare, is used by the Commission. It is kept current by looking for release updates twice a day. Electronic filing systems use Secure Sockets for sensitive Internet

connections and authenticating submissions. Dial-in authorization services are provided through Cisco’s CiscoSecure.

### 5.2.5 Supported Products

The following Exhibits present products currently in use within the FCC’s infrastructure and service areas.

Information Infrastructure Products	
Data Sharing and Administration Services	
Veritas Volume Manager 2.6	Online storage management – logical volume management
ArcServe 6.6	Automated backup and restore utility
Backup Agent for Open Files 6.6	Online backup and restore of “open files”
NDS 6.03	Novell Directory Services
Adobe Acrobat	PDF Viewer
WestLaw v7.2	Legal research service
Real Player v7.0	Multimedia file viewer
CompareRite v7.0 (Lexis-Nexis)	Document compare tool
Enterprise Reporting Services	
ManageWise 2.6	Remote network management and control
Clear Access (CA)	Ad-hoc query and reporting tool
Softrack v5.3b	Software usage and license metering [for NetWare]
Electronic Mail Services	
Lotus Notes	Email client
Domino Server 4.6.5	Email and messaging server
GroupWise Client 5.5	Email Client
GroupWise Gateway API 4.1	Provides access to GroupWise within other applications

**Exhibit 5-3. Information Infrastructure Products**

Communication Infrastructure Products	
Communication Services	
Novell Client 32	Networking software
Cisco Catalyst 5500	Gigabit switch [HW]
Cisco Catalyst Lightstream 1010	ATM switch [HW] (Cisco LS 1010)
Voice ISDN/Centrex	Telecommunications Services
Remote Access Services	
Cisco AS 5300 Remote Access Server	Remote access for telecommuters, supports ISDN, 56k, VoIP
Internet Access (Portal) Services	
IPlanet Web Server 4.1	HTTP web server
Collaboration Services	

**Exhibit 5-4. Communication Infrastructure Products**

Processing Infrastructure Products	
Platform Services	
Sun Solaris 2.5, 2.6	UNIX operating system
Novell NetWare 4.11	Network Operating System
Microsoft Windows 98	Client OS
Sun 450	Enterprise Server [HW]
POSIX UNIX	Portable operating system interface – Unix based
HP netserver	Intel-based server – Novell NetWare NOS [HW]
Sun 1000/1000Es	SPARC-based server – Sun Solaris (UNIX) OS [HW]
Office Automation Services	
Microsoft Office 97	Office automation software suite
NAL 2.7 (Z.E.N.Works)	Software distribution tool
Data Management Services	
Sybase 11.x	RDBMS
Sybase Open Client 11.x	
Oracle 7	RDBMS
Jaguar CTS	Component transaction server [part of enterprise application server 3.5]
Application Programming and Integration Services	
PowerBuilder 6.5, 5.04	Sybase development environment
SilverStream 2.7	Web application development environment
web.sql 1.1	Sybase middleware – connects databases to web servers
C++	Programming language
C	Programming language
HTML	Programming language
ColdFusion	Web application server and development environment
Actuate	Content creation – for publishing database info on the web
Sun Java	Programming Language
PERL 5.0.04	Scripting Language
MAPTHIS 1.3	Image mapping shareware for web publishing
VisualSpeller	Spell checker utility for Windows-based apps [Active X]
COBOL	Programming language
SQL*Net	Oracle client-server middleware
WinRunner (Mercury Interactive)	Automated testing tools
Cast Workbench 3.7	Version control and release mgt – code impact analysis tool
PowerDocs	Document Management – Windows client to DocsFusion
Electronic Filing Services	
NONE	
Workflow and Document Management Services	
NONE	
Forms Processing Services	
NONE	

Exhibit 5-5. Processing Infrastructure Products

Security Infrastructure Products	
Security Management & Administration Services	
Command Anti Virus v5.594	Antivirus software [for NetWare]
Gauntlet Firewall (PGP)	Firewall

Exhibit 5-6. Security Infrastructure Products

### 5.3 FCC Baseline Applications

The following paragraphs summarize the information systems that are operational within FCC. Although there are several small, specialized systems that are used by a limited number of people within the FCC (e.g., Travel Manager), this section is based on the technical profiles for mission critical systems that were collected as a part of the ITSP effort. All systems, however, including the numerous automated systems developed using Microsoft Access 97 in use throughout the Commission, will be supported by the architecture. Attached in Appendix C is a list of the name, Bureau or Office, and point of contact for each of these mission critical systems.

Exhibit 5-7, Summary of FCC Initiatives, presents an overview of FCC-specific projects and applications in use today. The chart indicates the system acronym, system owner (Bureau or Office), technologies employed, users, volumes, database size, and life cycle information. These systems are primarily PowerBuilder developed applications implemented on Sybase databases. The FCC “standard” is PowerBuilder and Sybase for applications. Currently, SilverStream and ColdFusion are also widely used. The FCC intends to replace the use of older products (e.g. PERL, web.sql) with more current products such as Java or Silverstream started in late FY 2001. The chart is followed by a compilation of short initiative descriptions characterizing system use and implementation.

Initiative	B/O	Technologies	Users	Volumes	DB Size	Life Cycle Issues
AAS	WTB	Windows NT Sun Solaris Sybase 11.5 PowerBuilder 6.5 Sapphire 6.0 ColdFusion 4.5 C, HTML, Java Perl, VB	Internal (WTB) External via Web	Approximately 6-12 auctions are run each year.	Each auction is independently run and may be 300 MB – 1 GB depending on the # of licenses in the auction and the # of rounds until it closes.	Operational since 1995 and is in the process of moving to the Internet. The Package Bidding subsystem is targeted to go into production 3/2001.
ACMS	OLA	Sun Solaris 2.6 Sybase 11.5 PowerBuilder 6.5 SilverStream 2.5	Internal Only (478 users)	In FY 2000, the FCC received 7,207 pieces of congressional correspondence	8.5 GB ~8 GB data ~500 MB log 13,744 records +50-60%/yr.	Operational since 12/99.
AETS	WTB	Sun Solaris Sybase PowerBuilder 6.5	Internal Only (25-30 users)	~30-40 transactions/mo.		Operational since 1998
ARMIS	WCB	Sun Solaris Sybase 11.0.3 PowerBuilder	Internal (FCC-wide) via intranet	7300 Annual DB queries	1.12 GB 80 MB/yr.	Currently 2 systems operational

Initiative	B/O	Technologies	Users	Volumes	DB Size	Life Cycle Issues
BLS	MB	Sun Solaris Sybase 11.0.3 PowerBuilder 5.04, C++ HTML, Java Pinnacle, PERL web.sql	Internal (MMB) via intranet, and desktop PowerBuilder application) External via internet	MDS – 600 applications/yr. ITFS – 800 applications/yr.	Processing DB 400Mb + 10%/yr. Forms DB 215 MB 30,000 stored apps + 2,000/yr.	Operational internally since 2/99, and for electronic filing on 6/00. Forms filing functions to be replaced with forms handling software eventually. WebSQL to be replaced by supported Web server software.
Case Tracking System	OGC	Sun Solaris Novell NetWare Sybase 11.0 PowerBuilder 6.5	Internal (OGC) External via the FCC Reference Room		100 MB - 70MB data - 30MB log	System implemented 11/98. Current version (6.5) operational since 4/00. The system should adequately serve the Office for the next 4-5 years without any major modifications or enhancements.
CDBS	MB	Sun Solaris Sybase 11.0.3 PowerBuilder 5.04, C++ HTML, Java Pinnacle, PERL web.sql Promula	Internal (FCC-wide) via intranet (MMB) via desktop PowerBuilder application External via internet	11,000 applications/yr. 8,000-10,000 filing forms/yr.	Processing DB 2.2 GB + 0.5 GB/yr. Forms DB 1.1 GB + 1 GB/yr.	System in production since 9/99. Electronic filing operational since 4/00. Forms filing functions to be replaced with forms handling software eventually. WebSQL to be replaced by supported Web server software. DTV implemented 6/00. LPPFM implemented 5/00.
CLASPlus	OMD	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5	Internal Only – Need to know basis	10-15 new records/week	1100 MB	Operational since 11/99. Enhancements have been identified and will be designed and implemented if funded.
COALS	WCB	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5 Java, PERL web.sql	Internal (FCC-wide) via intranet External via internet	30,000 transactions/yr.	11 GB + 35-40% growth near term + 15-18% stable growth	Available during 1 <sup>st</sup> quarter FY2001. Internal system operational 11/99. External interfaces being tested; target operational date pending a Rule Making.
Collections	OMD	Sun Solaris 2.5 Sybase 11.0.3 PowerBuilder 5.03, ColdFusion HTML Perl web.sql, C	Internal Only	2,500 filings/wk. (average month) 4,600 filings/wk. (peak month)	367 data tables	To be replaced by RAMIS in FY 2001.
CORES	OMD	Sun Solaris Sybase 11.0.3 Actuate, HTML Java, Jaguar	Internal (Admin and Proxy users) External via internet	1,000 registrations/wk 400 updates/wk 2000 internet queries/wk	1250 MB + 153 MB/yr.	Operational since 7/00.
COSER	IB	Sun Solaris Sybase 11.0.3 PowerBuilder 5.0.04, C	Internal (FCC-wide 15-18 users)	1-15 files/day with 10-250 records of data	Northbound – 307MB Used 600MB Total Southbound – 125MB Used 250MB Total	Northbound COSER has been in use approximately 6 years. Southbound COSER has been in use approximately 3 years. COSER as a whole is overdue for a total rewrite, and funding has been requested in both the FY 2001 and FY 2002 budgets.
CRS	OMD	Sun Solaris NetWare 4.11 Sybase 11.0.3 PowerBuilder 6.5	Internal Only (FCC-wide)	Cost – 1,500 transactions/mo. FTE – 2,000 transactions/mo.	78 Data tables Total source LOC ~ 5,000	To be replaced by new COTS system in FY 2002.

Initiative	B/O	Technologies	Users	Volumes	DB Size	Life Cycle Issues
Call Sign	MB	Sun Solaris Sybase 11.0.3 HTML, PERL, web.sql	Internal via CSRS' "staff" functions External via Internet (e- file is mandatory)	50 filings/month 200 queries/month	4,000 records + 500-600/yr.	Operational since 11/99. WebSQL to be replaced by supported Web server software FY 2002.
CTS	WCB	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5	Internal Only (CSB staff)	375-400 transactions/wk + 8-12% growth	325 MB + 8-12% growth	Operational since 1997. Develop replacement system to enhance current capabilities and interface with MTS
EAS	OET	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5 Adobe Acrobat 4 C++, HTML, Java/iPlanet SilverStream Visual Speller Perl, web.sql	Internal (average of 30/day) External (input avg. of 200/day query avg. of 4,000/day)	400 Applications processed/mo. 400 Internet filings/month 4,000 Internet uploads/month 450,000 Internet queries/month	128 GB + 20 GB/yr.	Operational since 9/98. Projected major revision in FY 2002.
EAS / TCB	OET	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5 Adobe Acrobat 4 C++, HTML Java/iPlanet SilverStream Visual Speller Perl, web.sql	Internal (average of 10/day) External (input avg. of 100/day query avg. of 500/day)	60 Applications audited/month 200 Internet filings/month 2,000 Internet uploads/month 30,000 Internet queries/month	128 GB (part of EAS database) + 10 GB/yr.	Operational since 6/2000. Projected revision in FY 2002.
ECFS	CGB	Sun Solaris 2.6 Sybase 11.0.3 PowerBuilder 6.5 HTML, web.sql	Internal via Intranet External via Internet	~2,150 total filings/mo. ~18.5% are electronic	150 GB	Operational since 10/1998. ECFS will eventually need major changes to fix work process problems that were not included in development.
EDOCS	OMD	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5 HTML, Java SilverStream	Internal via modules and Internet External via Internet	150 document records/wk 200 updates/wk 7,500-8,000 Internet queries/wk	4500 MB	Operational since 6/00. Major enhancements and automated data transfer (with other FCC systems) needed as soon as possible.
ELS	OET	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5 Adobe Acrobat 4 C++, HTML Java/iPlanet Visual Speller Perl, web.sql	Internal via NAL (average of 10/day) External via Internet (input avg. of 20/day query avg. of 60/day)	100 Applications processed/mo. 50 Internet fillings/month 200 Internet uploads/month 2,400 Internet queries/month	9.5 GB + 4 GB/yr.	Operational since 11/98. Projected major revision in FY 2002.
ETFS	WCB	Sun Solaris Sybase PowerBuilder 6.5 Visual Basic 6.0	Internal External via Internet	750-1,000 Internet queries/wk Avg. of 380MB filed/month Avg. of 315MB is archived to CD per month	Chicago – 25MB + 2GB of throughput/mo. Los Angeles – 50MB + 2GB of throughput/mo.	Since 7/98, ILECs have been required to use ETFS to file their tariffs and associated documents. Over 10,000 individual filing submissions have been officially received.

Initiative	B/O	Technologies	Users	Volumes	DB Size	Life Cycle Issues
Expert Adviser	CGB	Sun Solaris Novell 4.x Sybase  COTS product from Software Artistry written in KML (KnowledgeBase Manipulation Language)	Internal (approx. 70 concurrent)  External (whoever calls the FCC Consumer Centers)	8,000 consumer interactions/wk.	7.5 GB  + 200,000 – 500,000 records/yr.	Operational since 1996. This system is effectively nearing the end of its use. The endeavor to upgrade the system to Tivoli Service Desk has not yet been completed. A new company has acquired IBM Tivoli Service Desk. It does not appear that it will be supported for longer than 2 years, thus leaving the future of this help desk application in severe doubt.
GENMEN (includes Retrieval)	OMD	web.sql/Syberperl Javascript, C++ PowerBuilder 5	Internal and External (average 5 users per 10 second interval).	850,000 to 1,000,000 query results per month. Front end hits expected to be at least 25% higher.	965 MB on fccsun19w host server  1679 MB on gullfoss2  1150 MB on svartifoss2	Operational since 1993. The first major upgrade in 1995/6 where it was ported to the Internet using Syberperl and web.sql. Next major upgrade in late stages of development using ColdFusion 4.5, Actuate eReports, and Javascript. System will be in service indefinitely.
IBFS	IB	Sun Solaris Sybase 11.0.3 PowerBuilder 5.04 Actuate, C++, HTML Java, Perl web.sql	Internal (30-40 have access)  External via Internet	~ 3000-4000 applications/yr. Anticipate 1/3 to be e-filed.	204 MB	Operational since 12/98. Electronic filing operational 2/99. The system is functionally stable, however, the system is becoming increasingly difficult to maintain on the Internet side as it is based on rapidly aging technology which is no longer supported by the vendor. Serious consideration should be given to replacing WebSQL with supported Web server-side software.

Initiative	B/O	Technologies	Users	Volumes	DB Size	Life Cycle Issues
IDEAS-PD	OMD	Sybase 11.5 PowerBuilder 6.5	123 assigned DB users	~ 10,000 transactions/yr.	400 MB 288+ DB objects	Operational since 8/98. The system should adequately serve for the next 3 years without any major modifications or enhancements.
IVR	CGB	Windows NT 4.0 Service Pack 4 EIC version 1.2G	External (Maximum of 24 callers can be connected to the IVR at any given time)	Avg. 5,000 calls/week. Approx. 15% of calls require a query of the ULS DB	Using a VB program, options selected and calls are logged into the Windows NT event log for weekly processing	Operational since 1998. The current system is nearing the end of its life cycle. The updated version Enterprise Interaction Center (EIC 1.3C) has many enhancements that will be needed to efficiently continue automated services for licensing status checks.
KidVid	MB	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5 HTML, MapThis, SybPerl, web.sql	Internal via Intranet  External via Internet Only (E-filing is mandatory)	1580 TV stations file Form 398 for each quarter (>2/3 file at the end of the year, <1/3 file reports quarterly)	20,000 records + 4,500 records/yr.	Operational since 9/97. Functionally stable. WebSQL to be replaced by supported Web server software.
MTS	OMD	Sun Solaris Windows 98 Sybase 11.0.3 PowerBuilder 6.5	Internal Only – Need to Know Basis (mainly CSB, IB, WTB)	Receive approximately 2,000-3,000 items/year from WTB	147 MB +33 MB/yr. ~ 15,000 WTB entries in DB 18,418 Entries +4,392 entries/yr	Operational since 1995. To track work load efficiently, the FCC plans to move to an MTS-type system that can be used by all Bureaus and Offices. WTB/MTS is a separate system that WTB maintains.
OSCAR	CGB	Lotus Domino Server 4.6.5  Lotus Notes Document Imaging Mass Storage Server  Lotus Notes	Internal (127 CIB employees)  External via Internet	1,000-1,500 complaints processed/wk. (~400 Form 475 and the balance written and email complaints)	Production DB 3.5 GB ~83,000 complaints +3-4 GB/yr. Archives 4 GB ~150,000 complaints	Initial implementation 1997. Operating in its current state since 1/00. Life expectancy is through FY 2001 and partially into FY 2002.
Price Survey	WCB	Sun Solaris Sybase 11.0.3 PowerBuilder 6.5	Internal (CSB)  External (selected Cable Operators)	500-850 transactions/yr. + 6%/yr	100 MB (allowing for 6% growth)	Operational approximately 4 years.  It is anticipated that a replacement system will be developed to enhance current capabilities and eliminate manual processing.

Initiative	B/O	Technologies	Users	Volumes	DB Size	Life Cycle Issues
RAMIS	OMD	POSIX UNIX Oracle 7 COBOL, C, C++ Clear Access, ICE, Jaguar SQLNet	Internal Only (Module based access. Max ~ 200 emp.	Fee collections = 700,000 trans/yr. Loans = 2,000 8,000 associated transactions/yr. Fines and Forfeitures = 300-500 open/yr. Other = 3,000 transactions/yr.	Estimated DB size = 12 x 4 GB DASD	It is expected that a major modification of replacement for RAMIS will occur within the next three to five years. First module (loans) operational since 10/00.
ROSIE	OMD	Sun Solaris Sybase 11.0.3 ColdFusion HTML, Perl web.sql	External (License applicants)	12,000 transactions/yr.	100 MB ~55 MB data ~10 MB log	Operational since 10/99.
ULS	WTB	Sun Solaris Sybase 11.5 PowerBuilder 6.5 C, C++, HTML Java, MapInfo Perl, Sapphire	Internal (FCC-wide, esp. WTB) External via Internet	Can handle up to 200,000 applications/year	65 GB	ULS implementation phased in beginning 11/97. Approaching final implementation in the 3rd quarter of FY 2001. Redesign of original modules is now underway.

**Exhibit 5-7. Summary of FCC Baseline Applications**

### 5.3.1 Baseline Application Summary

Auctions Automation System (AAS) – The AAS provides the mechanism for the allocation of spectrum to commercial entities. It is part of a super-system, headed by the Universal Licensing System and with interfaces to the Commission’s financial systems, that ensures efficient and equitable allocation of the electromagnetic spectrum. The system provides automated support for all aspects of the auction process including initial inquiry, application processing, auction administration, and post auction processing. The system makes use of the latest designs in both combinatorial and Vickery auction theory.

Automated Congressional Management System (ACMS) – The ACMS is used to store, track, and respond to congressional correspondence.

Auctions Expenditure Tracking System (AETS) – AETS was initially designed to assist the Auctions Expenditure Management Branch (AEMB) in organizing current and historic electronic and paper files. The system enables AEMB staffers to monitor, track, and demonstrate accountability for all acquisitions, purchase orders, and travel invoices.

Automated Reporting Management Information System (ARMIS) – The ARMIS data retrieval system allows users to access a database containing financial and operational data of the nation’s largest local exchange carriers who file this data in compliance with Part 43 of the Commission’s Rules. The general public, members of the industry, and state regulatory agencies, among others, gain access to the ARMIS database via the Internet. The ARMIS database contains eight on-line reports.

Broadband Licensing System (BLS) – The BLS is a client-server license processing system that supports electronic filing and authorization of service in the Multipoint/Multichannel Distribution (MDS) and Instructional Television Fixed (ITFS) Services. BLS also provides access to station, application, and authorization information. Public access to the system is available through the Internet.

Case Tracking System – The Case Tracking System, or the Automated Information Tracking System (AITS), enables various members of the General Counsel’s staff and FCC Reference Room users to quickly access information pertinent to court cases and tasks assigned to the Bureau.

Consolidated Data Base System (CDBS) – The CDBS is a client-server license processing system that consolidates Broadcast Radio and Television application processing, engineering, EEO, ownership and tracking data. This Internet-based system permits electronic filing of broadcast radio and television applications and forms for authorization of service with the FCC. CDBS also provides public access to mass media electronic filings and information through the Internet.

Chairman’s Lifecycle Agenda System (CLASPlus) – CLASPlus is a software computer system that tracks the status of agenda items from the date of initiation at the Bureau or Office through the date of release. The activities related to the adoption of FCC decisions, or agenda items, are supported by CLASPlus, which generates various reports and is only used internally.

Cable Operations and Licensing System (COALS) – The COALS system is an upgraded combination of two older systems: the Cable Operational Processing System (COPS) and the Cable Television Relay Service (CARS). COALS provides cable operators and other multichannel video programming distributors (MVPDs) an electronic filing capability. Public access to the completed forms and applications is available through the Internet.

Collections – The Collections System tracks collections of fees and auctions, with the exception of the auction installment loans.

Commission Registration System (CORES) – CORES is a registration system for entities filing applications or making payments with the FCC. CORES will assign a unique 10-digit FCC Registration Number (FRN). The FRN will be used for all regulatees, licensees, and others with financial transactions. Public access to registration information is available through the Internet.

Canadian Co-Channel Serial Coordination System (COSER) – The Northbound and Southbound systems were designed to exchange data with Industry Canada (IC) in support of the COSER along the A-Line boundary separating the US and IC to ensure that broadcast transmission applicants would not interfere with existing broadcast facilities.

Cost Reporting System (CRS) – The CRS is used to track cost and usage of personnel by the organization, activity, and project they support. The system serves multiple purposes:

(1) to establish that resources are spent in compliance with budget-related mandates, (2) to identify costs associated with various Auctions and licensing activities to aid in determining fee rates, and (3) as a management tool to assist in making staffing decisions.

Call Sign Reservation and Authorization System (CSRS) – The CSRS provides a fully automated Call Sign reservation and authorization service that replaced the manual Call Sign Help Desk Service. The system enables broadcast radio and television licensees and permittees to ascertain whether a Call Sign is available, to request an initial Call Sign, and to change or exchange Call Signs electronically over the Internet. The system supports public access for call sign query, reservation, fee payment, and change request authorization over the Internet.

Cable Tracking System (CTS) – The CTS was designed to track the work of the Cable Services Bureau, excluding COPS and CARS (now COALS). The system accommodates concurrent user input and queries, and provides information management and reports for Bureau staff and managers. It consists of three different modules: Informal Complaints System, New Rates Cable Forms, and Administrative Tracking.

Equipment Authorization System (EAS) – The EAS permits users to submit applications to legally market equipment subject to the FCC Equipment Authorization Regulations. The associated web site allows the public to electronically complete and submit an application for a Grantee Code and for equipment authorization (FCC ID#). The system also provides several on-line search options.

Equipment Authorization System/Telecommunications Certification Bodies (EAS/TCB) The EAS/TCB provides a vehicle for TCB's to complete and submit applications for equipment authorization (FCC Form 731) in order to issue Grants of Authorization. In addition, it allows Accreditors to maintain TCB information.

Electronic Comment Filing System (ECFS) – The ECFS provides access to comments and comment indexing information filed in FCC rulemakings and docketed proceedings, via the Internet. Using ECFS, the public can view comments online or submit comments electronically using one of a variety of supported document formats. Although the system accepts comments both on paper and electronically, comments filed electronically are accessible more quickly than those filed on paper, primarily because paper-based submissions must first be prepared and scanned before they can be made available to the public via ECFS.

Electronic Document Management System (EDOCS) – The EDOCS is an Internet system designed to transmit documents from FCC Bureaus and Offices to the Office of Media Relations and the Secretary's Office for processing and release to the public. The system automates indexing and cataloging processes in the respective Offices, and produces the Daily Digest in a variety of forms. It provides public and staff access via an online index and full-text search engine.

Experimental Licensing System (ELS) – The ELS permits applicants to file requests for licensing for the use of the radio frequency spectrum for experimentation. This web site

allows the public to electronically file forms/requests and include all necessary exhibits. The public has access to licensing application information and several reporting options through the Internet.

Electronic Tariff Filing System (ETFS) – The ETFS is an Internet based system through which Incumbent Local Exchange Carriers (ILECs) submit official tariffs and associated documents to the FCC electronically in lieu of filing paper copies with the Secretary's Office. The public may also use the system, via the Internet, to view these electronically filed tariffs and associated documents.

Expert Advisor – Expert Advisor is a commercial off-the-shelf helpdesk application used by the Consumer Information Bureau's Consumer Information Center to manage the dissemination of information regarding FCC policy, rules, and regulations to the general public. The base product has been heavily customized to accommodate FCC's specific requirements and support FCC business processes with respect to handling calls from the general public, finding information, and providing callers with that information through various communication channels.

General Menu Reports (GENMEN) – The GENMEN application is a single front-end query system that allows users to access data in many of the FCC databases using the same common interface. Also included is another program, Retrieval, which creates reports referencing many of the FCC databases for internal purposes.

International Bureau Filing System (IBFS) – The IBFS is a consolidated licensing system that tracks application processing in the International Bureau (IB). The internal portion of IBFS consists of 13 subsystems, representing the 13 major processing areas for the IB. This Internet-based system allows for electronic filing of various applications and provides users with a variety of query and reporting options. The goal is to improve the speed and quality of service to applicants, researchers, and the general public.

Interactive Voice Response System (IVR) – The IVR currently handles approximately half of the inbound phone calls directed to the agency's Gettysburg Consumer Center. The IVR currently handles calls covering telephone slamming, cramming, universal service charges, prescribed line charges, license status checks for Amateur and Land Mobile license services, broadcast licensing fees, and license application Form 600 instructions. Information about slamming is also available in Spanish.

Children's Television Reporting System (KidVid) – KidVid is used to provide information on the efforts of commercial television broadcast stations to provide children's educational television programming as required by the Children's Television Act of 1990. The KidVid web site allows TV stations to complete and file the necessary forms electronically, while providing the general public with access to the completed reports through the Internet.

Management Tracking System (MTS) – The MTS is used by several Bureaus and Offices to track FCC activities or initiatives. These Bureaus and Offices use MTS to list and track their work product and generate status reports. The MTS database also serves as a

repository for coordinating Bureau and Office-level and Commission-level matters with the eighth floor. Through the use of MTS, there is great potential for coordinating the status of FCC-wide work for FCC staff and the public.

Operations Support for Complaints Analysis Resolution (OSCAR) – The OSCAR system is a client/server based tracking, document imaging, and reporting system maintained by the Consumer Information Bureau (CIB). Its purpose is to facilitate the processing of informal complaints filed with CIB involving common carriers. The system is used to enter and track the lifecycle of these complaints.

Price Survey – The Price Survey system was designed to respond to a Congressional mandate to track samplings of cable service rates within the U.S. The system provides data from which an annual report is published and provided to Congress. Each year between 500 and 850 cable operators are provided the URL and password to access the software to download and execute on their computers that allows for collection of this data. Once the data is collected, the provided software will save it to a diskette, which is then mailed to the FCC for a manual loading process.

Revenue Accounting Management Information System (RAMIS) – RAMIS is the accounts receivable module of the commercial off-the-shelf product of Digital Systems Group, Inc. RAMIS will encompass revenue collection, accounts receivable, and loan processing and serve as the next generation collection and revenue accounting platform for Auctions and the FCC. RAMIS will also support all aspects of financial management for the revenue and receipt functions of collection, processing, reconciliation, and reporting.

Remittance Over Secure Internet E-Commerce (ROSIE) – ROSIE is a payment system which allows license applicants to pay their application fees electronically via credit card. The system has been built to Department of Treasury security specifications, employing the latest encryption technology and architecture to safeguard data. ROSIE is accessed via links from licensing systems that offer the electronic credit card payment option.

Universal Licensing System (ULS) and Antenna Structure Registration (ASR) – ULS is the interactive licensing database developed by the Wireless Telecommunications Bureau to consolidate and to replace eleven existing licensing systems used to process applications and to grant licenses in wireless services. ULS provides numerous benefits, including fast and easy electronic filing, improved data accuracy through automated checking of applications, enhanced electronic access to licensing information, and increased automated license processing. ULS enables users to select the service and the purpose of the application for all wireless services; it dynamically creates screens that request only necessary information; it enables application coordinators to file applications using Electronic Batch Filing; and it provides application status for online query. In addition, ULS has been integrated with ASR for greater functionality. ASR is the interactive registration database developed to record owner registrations of antenna structures that require FAA notification with the FCC. ASR's TOWAIR software program enables users to check tower coordinates before they begin the license application process in ULS.

A growing number of FCC initiatives provide Internet access to Commission databases as well as providing, where appropriate, electronic filing services. All web applications designed for public use must function properly with FCC-supported Netscape and Internet Explorer browsers and use design methodologies that optimize access to the application(s). System availability (24x7) is a goal, particularly for electronic filing. Electronic filing covers 72 percent of the forms the public has to file; of that, approximately 60 percent of the filers that can use it do actually use it. The goal is to increase electronic filing and eventually eliminate paper filing.

## **5.4 Needs Not Satisfied with the Current Environment**

The fundamental goal of automation is to increase the effectiveness and efficiency with which an organization operates. Several opportunities to enhance the use of automation and information technology within the FCC were brought to light while examining the current IT environment. These enhancements will give Bureaus and Offices and system owners the IT tools necessary to meet their goals and objectives. These include, but are not limited to, the following:

- Adhering to the technology refreshment schedule
- Using common data standards across Bureaus and Offices to more easily share information
- Establishing public access, electronic filing, and information dissemination standards
- Establishing capacity planning and performance monitoring
- Improving backup, recovery, and archiving capabilities
- Improving the infrastructure for electronic system deployment
- Improving remote access to FCC financial systems and other database applications
- Improving remote access capabilities (e.g., file, print, and e-mail services) for telecommuters
- Improving the internal IT technical training program to keep FCC staff abreast of the newest technologies



## FCC Target Architecture

### 6.1 Overview

The baseline architecture outlined in Section 5 is a representation of FCC's current IT environment. The target architecture is a conceptual roadmap that guides the evolution of the architecture toward meeting the FCC's future goals and objectives, at both the Commission level and the Bureau and Office level.

The target architecture is intended to support the future needs identified in the ITSP's goals and objectives. These needs are articulated in the strategies developed in the working group sessions (see Appendix B). The strategies provide actions that the FCC can take to advance toward the vision articulated in ITSP goals.

During the strategy working group sessions, several promising technologies that do not currently exist in the baseline architecture garnered significant support. Technologies that revolved around the accessibility and security themes were deemed mandatory due to Federal directives for their implementation. Other types of technologies such as archival tape backup, document management, data storage, network management and data dictionary-related products received strong support from the representatives of the strategy working group sessions. Additional candidate technologies were identified during subsequent discussions and will evolve over time. Some of the technologies are shown in Exhibit 6-1. All the technologies are identified and linked to common ITSP strategy themes and to the infrastructures of the TRM.

The target architecture is expressed in terms of the four TRM infrastructures introduced in Section 4 and a standards profile. The target architecture is defined by:

- Common ITSP strategy themes supported through the target TRM
- Candidate technologies for achieving ITSP goals and objectives
- The infrastructures and services of the target TRM
- A detailed profile of TRM standards

### 6.2 Common IT Architecture Themes

Appendix B lists over 150 implementation strategies that were developed through working groups which met to discuss ideas on how the FCC can meet its IT goals and

objectives. There are fourteen common themes that span the objectives, nine of which are directly related to the ITSP's architecture. Many of the other strategies are linked to business process changes or improvements. These themes are presented in Appendix E and are discussed below and revisited later in this section when discussing the TRM services. Linking the services provided by the target architecture to the ITSP's common themes ensures that the target architecture will guide the FCC towards meeting its IT goals and objectives. The following architecture-related themes were derived from the IT strategies:

- **Accessibility** – Accessibility is a common theme among all ITSP Goals. Accessibility is a mandatory issue that refers to Section 508 of the Rehabilitation Act that requires that Federal agencies' electronic and information technology be accessible to people with disabilities. The corresponding strategies focus on enhancing systems to meet accessibility requirements, establishing FCC IT accessibility standards, and establishing processes to review and communicate accessibility standards.
- **Architecture** – Several strategies focus directly on the IT architecture. The architecture theme includes both process and system related concerns. The focus is on (1) documenting and publicizing the IT architecture, and (2) defining how to use, maintain, and enforce it.
- **Capacity and Capacity Planning** – Infrastructure capacity and capacity planning is a common strategic theme. These strategies identify issues related to identifying and appropriately using system capacity and instituting a capacity planning process.
- **Document Management** – The document management theme has a heavy presence in the second Goal. This theme emphasizes exploring and implementing document management, workflow management and document imaging solutions that provide improvements to Bureau and Office productivity and assist in enforcing and automating system documentation.
- **Electronic Filing** – Electronic Filing is a dominant theme in the first Goal. Electronic filing is already an ongoing activity at the FCC. Electronic filing strategies focus on customer-driven solutions that are secure, reliable, and 100 percent available.
- **Remote/Mobile Access** – This theme pertains to FCC telecommuters, field personnel, and travelers. Remote and mobile access stresses the use of state-of-the art solutions to provide uniform access to FCC systems. This also includes expansion of telecommuter access beyond the current e-mail and file systems to databases and other mission applications.
- **Security** – The security theme is prevalent in all three Goals. Appropriate levels of security are mandated by several Federal directives. The security theme stresses the importance of security as the FCC's networks expand and transparently interface with remote users and external constituents for electronic filing.
- **Sharing** – The sharing theme applies to information, code, and systems. It also includes formulating processes to foster sharing. Specific strategies address the use of electronic bulletin boards and other collaboration tools to exchange information, share knowledge, and build on "lessons learned," as well as the use of data repositories and warehouses to share data across applications.

- **Tools** – The tools theme refers primarily to application development tools. The focus is on a standardized approach to software development, access and delivery of data, and management of software-based systems.

### 6.3 Target Architecture Technologies

In developing the target architecture framework, an initial target architecture workshop was conducted with the focus of formulating a list of candidate technologies that could be used to help further the identified strategies. The workshop participants composed of senior IT staff and representatives from the Bureaus and Offices identified technologies that could enhance the Commission’s IT architecture and technical infrastructure based upon the input that was received from the Strategy Working Group Sessions. A list of 56 candidate technologies was developed and is listed in Appendix B. The group mapped the candidate technologies to the 170 ITSP strategies. The results of this exercise are presented in Appendix D.

The results were then analyzed to determine which technologies could have the largest impact within the FCC with respect to the ITSP’s goals, objectives, and strategies. This is summarized in Exhibit 6-1 that maps the key new technologies with the architectural themes.

Themes	Technologies
Accessibility	Assistive technologies
Architecture	ITC technical training and education
	Test-bed environment / staging area
	Computer room environmental issues
Capacity and Capacity Planning	Network Management tools
	Network Attached Storage
	Faster, higher bandwidth network backbone
	Capacity Management
	High-speed, high-capacity tape jukeboxes
	Storage Area Networks
	Centralized tape backup system
Document Management	Document Management tools
Electronic Filing	Web-based forms software package
	Portals technology
Remote/Mobile Access	High-speed telecommuter and traveler access
Security	PKI and other security technologies
Sharing	Data Warehouse / Repository / Dictionary
	Enterprise Management tools
Tools	Standard software development tools

**Exhibit 6-1. Infrastructure Themes Mapped to Technologies**

The purpose of this exercise was to identify technologies that can help the FCC achieve its ITSP goals and objectives, by prioritizing technologies based on their ability to support implementation of the ITSP strategies. As IT goals, objectives and technologies evolve, and as ITSP strategies are accomplished, the list of technologies and strategies will be reviewed and reprioritized.

## 6.4 Target Architecture Infrastructure Services

The following subsections describe the infrastructures and services of the target architecture. The baseline environment already provides some of these services. Others are aspirations of the ITSP. Together, they comprise the target ITSP services. Refer to Section 4, FCC Technical Reference Model Overview, for a functional description of the infrastructures and services.

### 6.4.1 The Information Infrastructure

The information generated, used, shared, and stored at the FCC represents the information infrastructure. It characterizes information by showing how it is used, generated, accessed, and maintained. The information infrastructure includes the Data Sharing and Administration Services, Electronic Mail Services, and Enterprise Management Services. Exhibit 6-2 presents a pictorial representation of each service's individual components. The subsequent subsections describe each service in more detail and specify the standards and technologies for the information infrastructure.

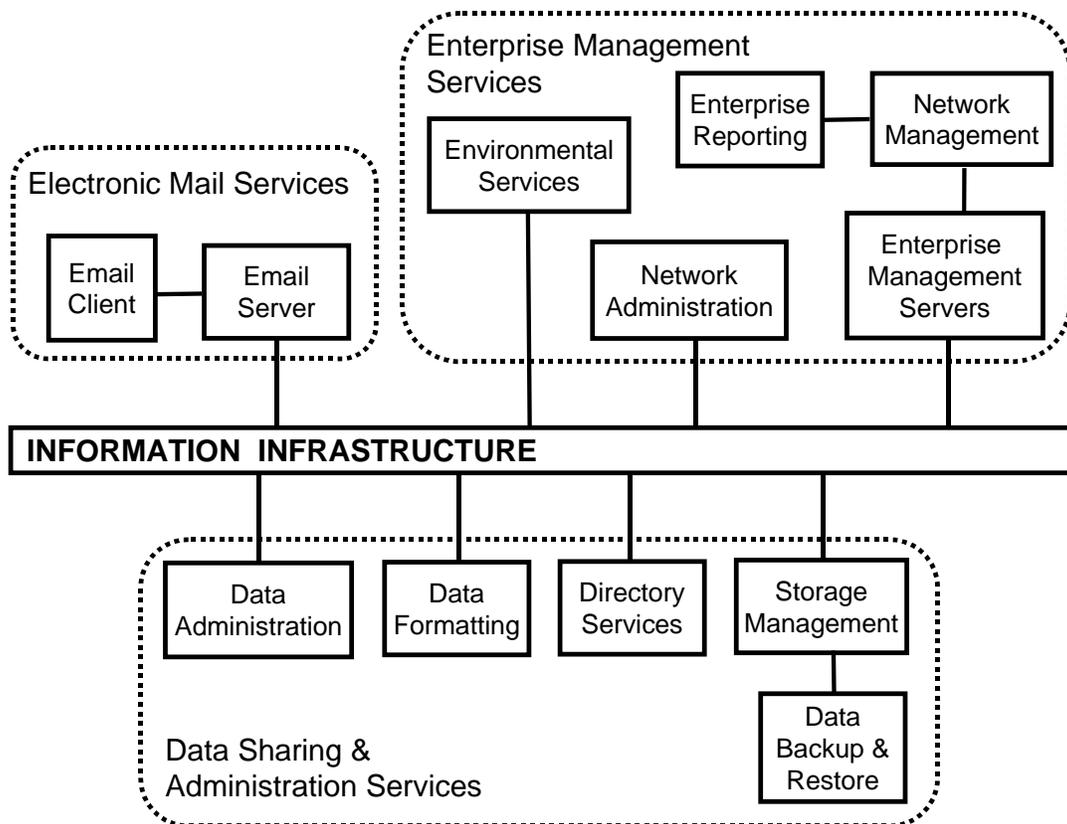


Exhibit 6-2. Target Information Infrastructure Services

### **6.4.1.1 Data Sharing and Administration Services**

Data sharing and administration services shall provide fast, highly reliable, and fully redundant data storage and backup capabilities for critical data by using technologies such as network attached storage, storage area networks, and high capacity tape jukeboxes. These services will also include enterprise management and reporting tools for capacity planning. Data sharing and administration services will provide a long term archival solution for records retention and for satisfying National Archives and Records Administration (NARA) requirements.

As imaging becomes more prevalent, data sharing and administration services shall incorporate imaging technologies into the architecture for fast storage, retrieval, and transfer of large image files. Additionally, these services will consider directory services based on standard directory access protocols for sharing of information and digital certificates (e.g., Public Key Infrastructure (PKI) and digital signatures).

The Data Sharing and Administration Services support the sharing and the capacity and capacity planning themes. Enterprise management services shall provide enterprise management tools that include network management, network administration, performance measurement, and reporting tools. Enterprise management services also include tools for monitoring and managing environmental services (e.g., power requirements, space, and building security).

The Enterprise Management Services support the capacity measurement and monitoring, and capacity planning and sharing themes.

Electronic mail services shall provide reliable, robust, and secure electronic mail access to all FCC personnel through an industry standard electronic mail system. The system will be able to support multiple modes of access.

The Electronic Mail Services support the accessibility, remote access, and security themes.

## **6.4.2 The Communication Infrastructure**

The communication infrastructure provides connectivity while promoting interoperability and scalability. This infrastructure encompasses internal and external connectivity that includes information exchange within the FCC LAN/WAN environment, as well as with field offices, remote users, and constituents. The communication infrastructure includes Communications Services, Remote Access Services, Internet Access (portal) Services, and Collaboration Services. Exhibit 6-3 presents a pictorial representation of each service's individual components. The subsequent subsections describe each service in more detail and specify the accepted standards and technologies for the communication infrastructure.

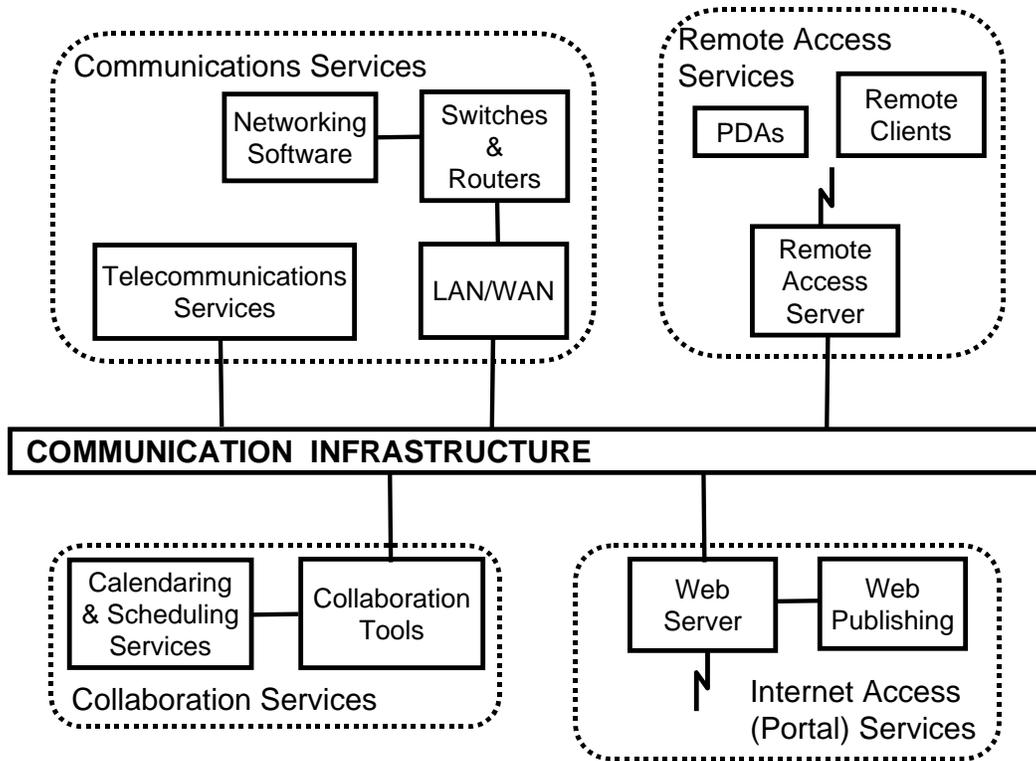


Exhibit 6-3. Target Communication Infrastructure Services

### 6.4.2.1 Communications Services

Communications Services support upgrades to the network backbone, as needed, in a modular fashion based on network usage reports and capacity planning by Enterprise Management Services. Communications Services will request that system owners and project managers perform traffic analysis/bandwidth requirements estimates to determine impact of new or updated systems on network performance and capacity.

The network shall easily accommodate standards-based upgrades such as new cable and higher speeds to the desktop without significant redesign. Communications Services will strive for a 100 percent Internet Protocol (IP)-based network to support emerging IP technologies (such as Voice Over IP).

The Communications Services support the architecture, capacity and capacity planning, remote access, and sharing themes.

### 6.4.2.2 Remote Access Services

Remote Access Services will provide uniform, high-speed remote access to FCC systems. These services support telecommuters’ access to internal FCC systems including file and print servers, e-mail, and databases. They also support field personnel access from field offices. Technologies such as terminal servers will be considered in an ongoing effort to

enhance the functionality and efficiency of remote access. Remote Access Services will also include support for wireless access from the field using technologies such as laptops and PDAs.

In addition to access for telecommuters, Remote Access Services also support uniform, reliable, high-speed access to FCC systems from external constituents for e-filing, information access, and other communications with the FCC.

The Remote Access Services support the accessibility, electronic filing, and remote access themes.

### **6.4.2.3 Internet Access (Portal) Services**

Internet Access Services provide a portal or a unified web-based interface to FCC web-based e-filing, informational, and correspondence systems. These services provide advanced web publishing using state-of-the-art, standards-based technologies to create highly functional web interfaces that increase productivity and accessibility and ease the burden on external constituents. Internet Access Services will work in conjunction with the Application Development and Integration Services to reserve a portion of the FCC development test-bed for reviewing web content before it is transferred to a production web server.

The Internet Access (Portal) Services support the accessibility, architecture, electronic filing, and sharing themes.

### **6.4.2.4 Collaboration Services**

Collaboration Services will provide standards-based collaboration tools to support a seamless, and fully integrated collaborative working environment. These services may interface with other services such as Workflow and Document Management Services, Forms Processing Services, and Office Automation Services.

Collaboration Services support the document management, electronic filing, and sharing themes.

## **6.4.3 The Processing Infrastructure**

The processing infrastructure supports the information and communication infrastructures by providing an environment for developing and managing information processing systems and applications. The processing infrastructure includes Platform Services, Office Automation Services, Data Management Services, Application Programming Services, Electronic Filing Services, Workflow and Document Management Services, and Forms Processing Services. Exhibit 6-4 presents a pictorial representation of each service's individual components. The subsequent subsections describe each service in more detail and specify the accepted standards and technologies for the processing infrastructure.

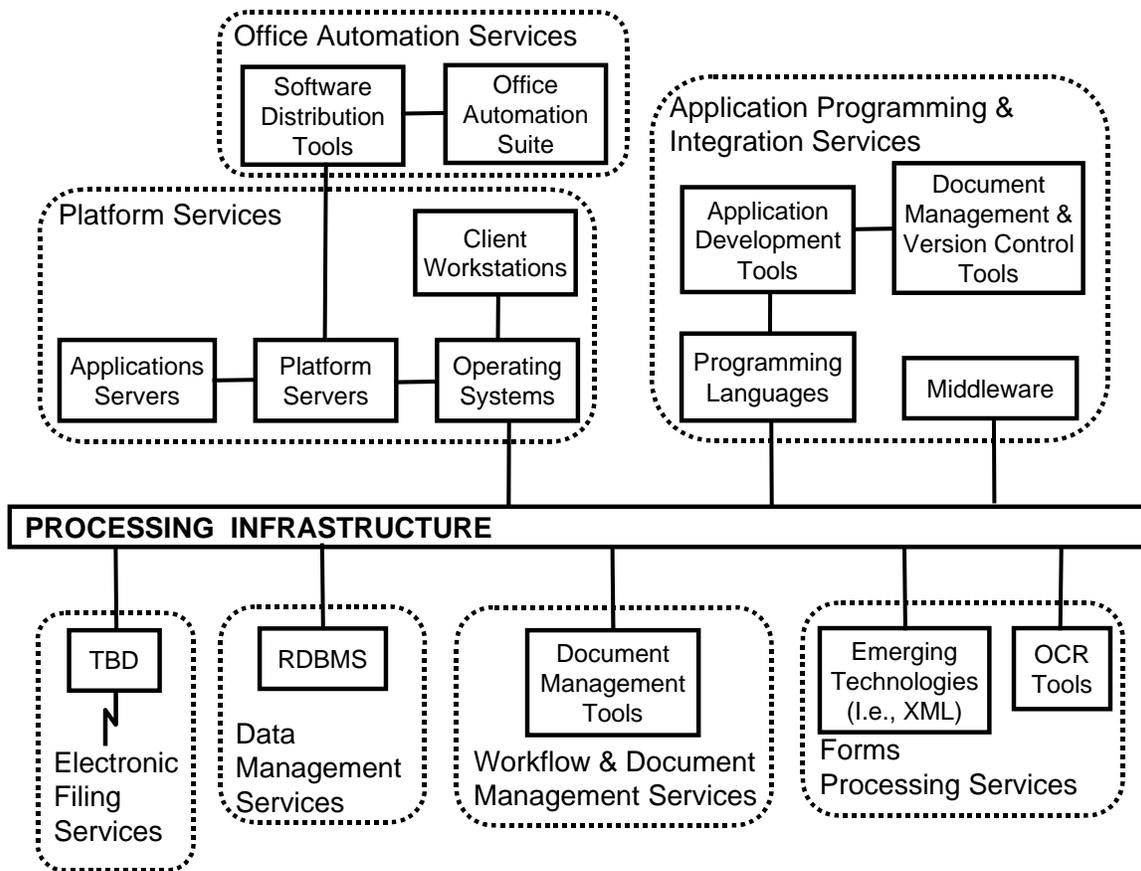


Exhibit 6-4. Target Processing Infrastructure Services

### 6.4.3.1 Platform Services

Platform services will provide continued support for operating systems, application servers, file and print servers, client workstations, and all other platform related hardware and software in the baseline through periodic reviews and upgrades (technology refreshment) and the needs of new initiatives.

Platform Services will also take into account the implementation of centrally managed desktops, support for other operating systems, support for multiple client types, and specialized (high-end) printing services.

The Platform Services support the architecture themes.

### 6.4.3.2 Office Automation Services

Office Automation Services will provide continued support for desktop and remote user office automation tools available in the baseline through periodic reviews and upgrades

(technology refreshment) and the needs of new initiatives. Office automation services will incorporate project management tools for more efficient and automated project management and execution, and Enterprise Resource Planning (ERP) focused applications to support automated project management.

The Office Automation Services supports the accessibility theme.

### **6.4.3.3 Data Management Services**

Data Management Services will promote the use of data warehousing and repository technologies. Data management services will request that system owners and project managers use a common data dictionary to promote data sharing and a common approach to database development.

Data Management Services will promote the use of information engineering tools for analyzing disparate data to determine similarities and to create an enterprise data dictionary and repository. Data Management Services will also promote a common method for retrieving, storing, and normalizing data contained in forms and other automated data collection methods.

The Data Management Services support the architecture, remote access, and sharing themes.

### **6.4.3.4 Application Programming and Integration Services**

Application Programming and Integration Services will recommend and support a standard set of software development tools for application development and integration. The Application Programming and Integration Services will work in conjunction with Document Management and Workflow Services to support version control tools as needed for code development and system documentation.

This service will also set up, administer, and maintain a test bed for application development and integration testing. The test bed will be available for all development efforts within the FCC and will contain test versions of standard platforms, databases, communications equipment, hardware, and software presently installed at the Commission. Application Programming and Integration Services will work in collaboration with Workflow and Document Management Services to promote the sharing of information including code, systems, and development processes.

The Application Programming and Integration Services support the accessibility, architecture, remote access, sharing, and tools themes.

### **6.4.3.5 Electronic Filing Services**

A common implementation of Electronic Filing Services is not available in the baseline architecture. These services shall be cultivated to provide robust, standardized, highly

available electronic filing capabilities to the FCC's external constituents. As standards for electronic filing emerge within the Federal Government, the ITSP will assess and adopt any such standards that meet the FCC's electronic filing needs.

The Electronic Filing Services support the architecture, document management, accessibility, tools, and sharing themes.

#### **6.4.3.6 Workflow and Document Management Services**

A common implementation of Workflow and Document Management Services is not available in the baseline architecture. Workflow and Document Management Services will provide automated document management products that include workflow tools for document routing, tracking, editing, and version control. The implementation of workflow tools should include the automation of business processes and the formulation or reengineering of business processes that are needed to support strategies identified in the strategic planning portion of this document.

The Workflow and Document Management Services support the capacity and capacity planning and sharing themes.

#### **6.4.3.7 Forms Processing Services**

A common implementation of Forms Processing Services is not available in the baseline architecture. These services will provide web-based forms processing tools and software packages to support electronic filing. Forms Processing Services will also integrate with workflow tools to manage internal forms processing for business processes.

The Forms Processing Services support the electronic filing and tools themes.

### **6.4.4 The Security Infrastructure**

The security infrastructure weaves through the information, communication, and processing infrastructures to ensure only authorized users get access to the information they need. The security infrastructure unites the three infrastructures using policies, procedures, and technologies to provide an environment in which information can be securely processed and exchanged. To accomplish this, the security infrastructure includes Security Management and Administration Services. Exhibit 6-5 presents a pictorial representation of the service's individual components. The subsequent subsection describes the service in more detail and specifies the accepted standards and technologies for the security infrastructure.

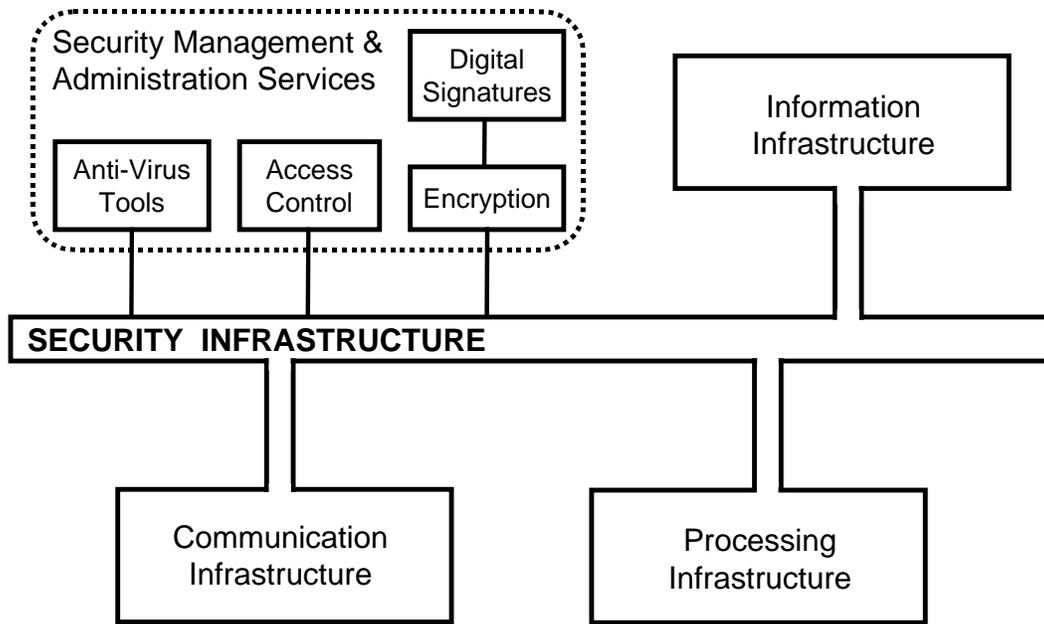


Exhibit 6-5. Target Security Infrastructure Services

### 6.4.4.1 Security Management and Administration Services

Security Management and Administration Services will support PKI and other emerging security technologies as they mature. PKI, electronic signatures, digital certificates, and other security related technologies that are based on ITSP security standards will enable the FCC to meet security requirements outlined in OMB Circular A-130 and other security-related directives.

These technologies will improve access control, authentication, and secure transmission of data. At the same time, the certificate infrastructure necessary to implement PKI can be used for digital signatures in e-filing, forms processing, workflow, and document management applications. Security services will also take into account the use of distributed host-based firewalls for intrusion prevention and detection.

The Security Management and Administration Services support the architecture, electronic filing, security, and sharing themes.

## 6.5 Technical Standards Profiles

The following sections present the standards associated with the infrastructures and service areas described above.

### 6.5.1 Information Infrastructure Standards

Information Infrastructure Standards	
Data Sharing and Administration Services	
File Transfer	<ul style="list-style-type: none"> <li>File Transfer Protocol (FTP) – IETF RFC 959</li> <li>Unix to Unix Copy (UUCP)</li> </ul>
Image Formats	<ul style="list-style-type: none"> <li>Tag Image File Format (TIFF) 6.0 – Adobe</li> <li>Portable Network Graphics (PNG) – W3C</li> <li>Graphics Interface Format (GIF) – (CompuServe v.89a:1989)</li> <li>Joint Photographic Experts Group (JPEG) – ISO/IEC 10918</li> </ul>
Video Formats	<ul style="list-style-type: none"> <li>Moving Pictures Experts Group (MPEG) and (MPEG2) – ISO/IEC 13818, 11172</li> </ul>
Document Formats	<ul style="list-style-type: none"> <li>Rich Text Format (RTF)</li> <li>ASCII text</li> <li>Portable Document Format (PDF) – Adobe</li> <li>HyperText Markup Language (HTML) – IETF RFC 1866</li> <li>Standard Generalized Markup Language (SGML) – ISO 8879:1986</li> <li>eXtensible Markup Language (XML) – W3C REC-XML-19980210</li> <li>Computer Graphics Metafile (CGM) – ISO/IEC 8632</li> </ul>
Directory Services	<ul style="list-style-type: none"> <li>Lightweight Directory Access Protocol (LDAP) v3 – IETF RFC 2251-2256</li> <li>Directory Services, Distributed Computing Environment (DCE) 1.1 – Open Group Common Application Environment (CAE) Spec C705:1988</li> <li>Directory Access – ITU X.500</li> </ul>
Data Interchange Services	<ul style="list-style-type: none"> <li>Electronic Data Interchange (EDI) – ITU X.435, FIPS PUB 161-2, ANSI X.12</li> <li>Initial Graphics Exchange Specification (IGES) – FIPS PUB 177-1</li> </ul>
Enterprise Reporting Services	
Support Network Management	<ul style="list-style-type: none"> <li>Simple Network Management Protocol (SNMP) v3 – IETF RFC 2570 –2576</li> <li>Management Information Base (MIB) II – IETF RFC 2011</li> <li>Remote Monitoring (RMON) – IETF RFC 2819</li> </ul>
Electronic Mail Services	
Electronic Mail	<ul style="list-style-type: none"> <li>Simple Mail Transfer Protocol (SMTP) – IETF RFC 821</li> <li>Multi-purpose Internet Message Extensions (MIME) attachments – IETF RFC 2045-2049</li> <li>Internet Message Access Protocol (IMAP4) – IETF RFC 2060, 2061</li> <li>Message Disposition Notifications – IETF RFC 2298</li> <li>Delivery Status Notifications – IETF RFC 2852</li> <li>Secure/MIME (S/MIME) – IETF RFC 2311</li> </ul>

**Exhibit 6-6. Information Infrastructure Standards**

### 6.5.2 Communication Infrastructure Standards

<b>Communication Infrastructure Standards</b>	
Communications Services	
LAN: Cable	<ul style="list-style-type: none"> <li>• Average Wire Gauge (AWG) 24 Category 5 4-pair plenum</li> <li>• Fiber Distributed Data Interface (FDDI) using 50/125 or 62.5/125 micron fiber</li> </ul>
LAN: Access Control	<ul style="list-style-type: none"> <li>• Ethernet – IEEE 802.1.3:1985</li> <li>• 100BaseT Ethernet – IEEE 802.3u</li> <li>• Gigabit Ethernet – IEEE 802.3ab</li> <li>• Wireless – IEEE 802.11</li> </ul>
LAN and WAN: Transport, Network, and Services	<ul style="list-style-type: none"> <li>• Transmission Control Protocol (TCP) – IETF RFC 793</li> <li>• Internet Protocol( IP) – InterNIC - IS 0005:1981; IETF RFC 791, 919, 922, 1112, 2228, 2640</li> <li>• Internet Protocol (IP) version 6 – IETF RFC 1886, 1887</li> <li>• User Datagram Protocol (UDP) – IETF RFC 768</li> <li>• Internet Control Message Protocol (ICMP) – IETF RFC 792, 950</li> <li>• Dynamic Host Configuration Protocol – IETF RFC 2131</li> </ul>
WAN	<ul style="list-style-type: none"> <li>• Integrated Services Digital Network (ISDN) – FIPS PUB 182: 1993</li> <li>• Frame Relay – ANSI T1.606, T1.617, T1.618</li> <li>• Asynchronous Transfer Mode (ATM) – ANSI T.1.5</li> <li>• ATM Multiprotocol Over ATM (MPOA) – ATM Forum MPOA v1.0</li> <li>• Synchronous Optical NETwork (SONET) – ANSI T1.105, T1.403 (DS1), T1.404 (DS2)</li> <li>• Fiber Distributed Data Interface (FDDI) – ISO 9314</li> <li>• Packet – ITU X.25</li> </ul>
Computer Telephony Services	<ul style="list-style-type: none"> <li>• Application Interoperability – Enterprise Computer Telephony Forum (ECTF) A.X00</li> <li>• Call Control Interface – ECTF C.X00</li> <li>• Hardware Compatibility Interface – ECTF H.100</li> <li>• Media and Switching Services Interface – ECTF S.100</li> <li>• Transport Protocol Interface – ECTF S.200</li> <li>• Service Provider Interface – ECTF S.300</li> <li>• Media Services for JTAPI (Java Telephony API) – ECTF S.410</li> <li>• Administrative Services Interface – ECTF S.900</li> <li>• Voice Over Internet Protocol (VoIP) – ITU H.323</li> </ul>
Wireless Telecommunications Services	<ul style="list-style-type: none"> <li>• Voice eXtensible Markup Language (VoiceXML) – W3C</li> <li>• Wireless Markup Language (WML) – WAP Forum</li> <li>• Wireless Application Protocol (WAP) – WAP Forum</li> <li>• Cellular Digital Packet Data (CDPD)</li> <li>• Code Division Multiple Access (CDMA)</li> </ul>

<b>Communication Infrastructure Standards (continued)</b>	
Facsimile Services	<ul style="list-style-type: none"> <li>• Facsimile Standards (Group 3) – ITU T.4</li> <li>• Facsimile Standards (Group 4) – ITU T.6</li> <li>• Facsimile Coding Schemes (Group 4) – FIPS PUBS 150</li> </ul>
Digital Radio Services	<ul style="list-style-type: none"> <li>• Project 25 LMR standards as adopted in the Federal Telecommunication Recommendation 1024a-1997</li> </ul>
<b>Remote Access Services</b>	
Remote LAN Interfaces	<ul style="list-style-type: none"> <li>• Point-to-Point Protocol (PPP) – IETF RFC 1661, 2153</li> <li>• Serial Line Internet Protocol (SLIP) – InterNICIS 0047:1993</li> <li>• Multilink Point-to-Point Protocol (MPP) – IETF RFC 1990</li> <li>• PPP over Ethernet (PPPoE) – IETF RFC 2516</li> </ul>
Remote Terminal Access (Virtual Terminal Emulation)	<ul style="list-style-type: none"> <li>• Telnet (A terminal emulation program for TCP/IP networks) – InterNIC - IS 0008:1983</li> <li>• TN3270 – IETF RFC 1576)</li> </ul>
Secure Remote Access	<ul style="list-style-type: none"> <li>• Secure Hyper Text Transfer Protocol (S-HTTP) – IETF RFC 2660</li> <li>• Secure Sockets Layer (SSL) protocol – The Open Group, Specification SSL-3)</li> </ul>
<b>Internet Access (Portal) Services</b>	
Support Inter/Intranet Services	<ul style="list-style-type: none"> <li>• HyperText Transfer Protocol (HTTP) – IETF RFC 2068</li> <li>• Common Gateway Interface (CGI) – ISO/IEC 9636</li> </ul>
<b>Collaboration Services</b>	
Multimedia Teleconferencing Services	<ul style="list-style-type: none"> <li>• ISDN Video Teleconferencing – ITU H.320</li> <li>• LAN Video Teleconferencing – ITU H.323</li> <li>• POTS Video Teleconferencing – ITU H.324</li> <li>• ATM Video Teleconferencing – ITU H.310</li> <li>• Data Conferencing – ITU T.120</li> <li>• Host extensions for IP multicasting – IETF RFC 1112, 2236</li> </ul>
Calendaring and Scheduling Services	<ul style="list-style-type: none"> <li>• iCalendar (Internet Calendaring and Scheduling Core Object Specification)</li> <li>• vCalendar (Versit Consortium), Calendaring Interoperability Protocol (CIP), Calendaring Interoperability under HTTP (CIH)</li> </ul>

**Exhibit 6-7. Communications Infrastructure Standards**

### 6.5.3 Processing Infrastructure Standards

Processing Infrastructure Standards	
Platform Services	
Operating System Services	<ul style="list-style-type: none"> <li>• Microsoft Windows 2000</li> <li>• Microsoft NT Server</li> <li>• UNIX</li> </ul>
User Interface Services	
User Command Interface Services	<ul style="list-style-type: none"> <li>• Use native operating system capabilities</li> </ul>
Windowing Services	<ul style="list-style-type: none"> <li>• Microsoft Windows Product Family</li> </ul>
Graphics Services	<ul style="list-style-type: none"> <li>• OpenGL</li> <li>• Programmer's Hierarchical Interactive Graphics System (PHIGS) – FIPS PUB 153-1</li> <li>• Computer Graphics Metafile (CGM) – ISO/IEC 8632</li> </ul>
Resource Naming and Resolution	<ul style="list-style-type: none"> <li>• Domain Name Service (DNS) – IETF RFC 1035</li> </ul>
Office Automation Services	
Office Automation	<ul style="list-style-type: none"> <li>• Microsoft Windows Office Suite</li> </ul>
Data Management Services	
Data Management Services	<ul style="list-style-type: none"> <li>• Open Database Connectivity (ODBC)</li> <li>• Structured Query Language (SQL) – ANSI X3.135, FIPS PUB 127-2</li> <li>• Information Resource Dictionary System (IRDS) – ISO/IEC 10027</li> </ul>
Application Programming and Integration Services	
Application Programming Languages	<ul style="list-style-type: none"> <li>• C – ANSI, ISO/IEC 9899</li> <li>• C++ – ANSI, ISO/IEC</li> <li>• Visual Basic</li> <li>• Java</li> </ul>
Distributed Computing Services	<ul style="list-style-type: none"> <li>• Distributed Computing Environment (DCE) 1.1 – Open Group CAE Spec P409</li> <li>• Common Object Request Broker Architecture (CORBA) – Object Management Group (OMG) 2.4.1</li> <li>• WebNFS - IETF RFC 2054 – <i>EMERGING STANDARD</i></li> <li>• Portable Operating System Interface for UNIX (POSIX) – IEEE P10033</li> </ul>
Electronic Filing Services	
Electronic Filing	(none identified at this time)
	<ul style="list-style-type: none"> <li>•</li> </ul>

Processing Infrastructure Standards (continued)	
Workflow and Document Management Services	
Document Management	<ul style="list-style-type: none"> <li>Open Document Management API (ODMA) 2.0</li> </ul>
Forms Processing Services	
Forms Processing	<ul style="list-style-type: none"> <li>Optical Character Recognition (OCR) – ANSI/NCITS X3.209-1992 (R1997)</li> <li>EXtensible Markup Language (XML) 1.0 – W3C REC-XML-20001006</li> <li>Form Interface Management System (FIMS) – ISO 11730</li> </ul>

**Exhibit 6-8. Processing Infrastructure Standards**

### 6.5.3 Security Infrastructure Standards

Security Infrastructure Standards	
Security Management and Administration Services	
Encryption	<ul style="list-style-type: none"> <li>Data Encryption Standard (DES) – FIPS PUB 46-2</li> <li>Guidelines for Implementing and using the NBS Encryption Standards – FIPS PUB 74</li> <li>Security Requirements for Encryption Modules – FIPS PUB 140-1</li> <li>Interoperability and Security Requirements for Use of the Data Encryption Standard with CCITT Group 3 Facsimile Equipment – FIPS PUB 141</li> <li>Key Management Using ANSI X9.17 – FIPS PUB 171</li> <li>Escrowed Encryption Standard (EES) – FIPS PUB 185</li> <li>POSIX Security Extensions – IEEE 1003.1e &amp; c</li> <li>Internet Security Association and Key Management Protocol (ISAKMP) – IETF RFC 2408</li> <li>IP Secure (IPSEC)</li> </ul>
Digital Signature	<ul style="list-style-type: none"> <li>Computer Data Authentication – FIPS PUB 113</li> <li>Secure Hash Standard (SHS) – FIPS PUB 180-1</li> <li>Digital Signature Standard – FIPS PUB 186</li> <li>Guideline for the Use of Advanced Authentication Technology Alternatives – FIPS PUB 190</li> <li>Internet Security Association and Key Management Protocol (ISAKMP) – IETF RFC 2408</li> <li>PKI Certificate and Certificate Revocation List (CRL) Profile v3 – ITU X.509</li> </ul>
Access Control	<ul style="list-style-type: none"> <li>RSA Public Key Cryptography – (A public-key encryption technology developed by RSA Data Security, Inc)</li> <li>Kerberos – (An authentication system developed at the Massachusetts Institute of Technology) DCE-SS 1.1</li> <li>Generic Security Service Application Programming Interface (GSSAPI)</li> <li>Entity Authentication Using Public Key Cryptography – FIPS PUB 196</li> </ul>
IP Security	<ul style="list-style-type: none"> <li>Security Architecture for Internet Protocol – IETF RFC 2401</li> </ul>

**Exhibit 6-9. Security Infrastructure Standards**



# Implementing the IT Strategic Plan

## 7.1 Overview

Implementation of the ITSP is not a one-time event. The ITSP is a living entity—going through continuous updates and revisions - intended to keep pace with changing technology and business needs. As the plan changes, its derivative strategies will be continuously reviewed, updated, reprioritized, and implemented.

There are four components to implementing the ITSP. The first component is developing a prioritized set of strategies, or tactical actions. The second is to define the roles and responsibilities of essential groups and individuals throughout the FCC. The third component is the budgeting and planning processes for new and existing IT investments. Finally, the fourth component is the processes for assessing IT initiatives for compliance.

Each of these components is addressed in this section.

## 7.2 Implementation Strategies

Implementation strategies are a “to do list” of items necessary to implement the ITSP. The FCC’s goals and objectives (Section 3), the standards (Section 6), and the strategies introduced here provide the roadmap for reaching the target architecture. These strategies were formulated through a series of working groups that included representation from all FCC Bureaus and Offices. Implementation strategies are updated through the IT Strategic Goals and Objectives update process. A list of strategies for implementation of the ITSP is presented in Appendix B.

## 7.3 Roles and Responsibilities

This section defines roles and responsibilities within the FCC (ITC and the Bureaus and Offices) in the context of implementing and updating the ITSP. The roles and responsibilities defined here are a mixture of individual roles and group roles. This section details each group (or individual), the group’s focus, its representation, its responsibilities, and its authority. It is important to stress that these are roles and responsibilities as they relate to implementing and maintaining the ITSP. All individuals and groups identified in Section 7.3.2 are members of at least one of the established review groups described in Section 7.3.1.

### 7.3.1 Review Groups

Four review groups have been defined for implementing and updating the ITSP, as shown in Figure 7-1. These groups are responsible for reviewing and recommending changes to the ITSP, approving changes to the ITSP, and prioritizing and approving the FCC’s IT budget. Each group’s charter, and its charter members are detailed in this section. These groups, their charters, and their membership will periodically be reviewed and updated as part of ITSP maintenance.

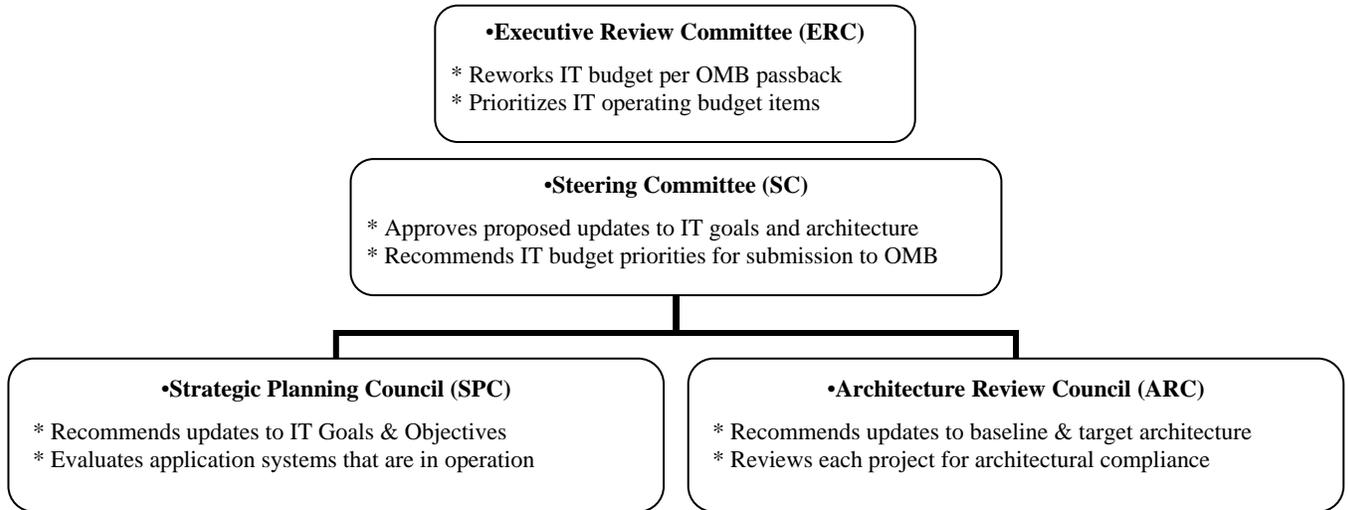


Figure 7-1. Information Technology Review Groups

#### Strategic Planning Council (SPC)

**Charter:** The SPC is responsible for reviewing and recommending updates to the FCC’s IT Strategic Goals and Objectives. This process also includes reviewing, updating, and reprioritizing the ITSP’s implementation strategies. The IT Strategic Goals and Objectives are updated on an annual basis.

The SPC is also responsible for reviewing each major or significant application system which is in operation, to determine whether the system is meeting its goals, meeting the Commission's needs, and satisfying the system's users. The SPC will review each such system at least once every two years. As a result of its review, the SPC may make recommendations to the Chief Information Officer and the Chiefs of Bureaus and Offices that are affected by the system.

**Members:** Deputy CIO for Customer Service, CSRs, Chief of Planning & Support Group, Bureau & Office Representatives, IT Security Officer.

### **Architecture Review Council (ARC)**

**Charter:** The ARC is responsible for reviewing and recommending updates to the baseline and target architectures. This includes updates to current IT products in use at the FCC, acceptable services, standards, and recommended products. The ARC will also participate in life cycle phase reviews for projects as they work their way through the SDLC.

**Members:** Deputy CIO for Technical & Support Services, Designated CSRs, ITC Group Chiefs, Technical Representatives from Bureaus & Offices who have designated one, IT Security Officer.

### **Steering Committee (SC)**

**Charter:** The SC is responsible for approving and rejecting proposed updates to IT Strategic Goals and Objectives and the architecture by the SPC and ARC. It is also responsible for recommending priorities for OMB budget submissions.

The Steering Committee also fulfills the role envisioned in OMB Circular A-130, Appendix IV:

“Many agencies will institute a second board, composed of program or project level managers, with more detailed business and information resource knowledge. They will be able to provide technical support to the senior level board [the Executive Review Committee] in proposing, evaluating, and recommending information resource investments.”

**Members:** Chief Information Officer, Chief of the Information Technology Center’s (ITC’s) Network Development Group (as liaison from the Architecture Review Council), Chief of the ITC’s Planning and Support Group (as liaison from the Strategic Planning Council), Bureau and Office representatives, and such other members as the Chief Information Officer shall designate.

The Chief Information Officer or his designee shall chair and administer the Steering Committee.

### **Executive Review Committee (ERC)**

**Charter:** The Executive Review Committee is established pursuant to OMB Circular A-11, Section 300.5, which requires that:

“A cross-functional executive review committee acting for or with the Agency Head must be responsible for managing the agency’s entire capital

asset portfolio, making decisions on the best allocation of assets to achieve strategic goals and objectives within budget limits.”

The Executive Review Committee is also established pursuant to OMB Circular A-130, Appendix IV, which requires that:

“The CIO will help establish a board composed of senior level managers, including the Chief Financial Officer and Chief Procurement Executive, who will have the responsibility of making key business recommendations on information resource investments, and who will be continuously involved.”

The ERC is responsible for prioritizing the IT operating budget items and approving the rework of the annual IT budget submission per direction of OMB for inclusion in the President’s budget proposal to Congress.

**Members:** The members of the ERC shall be the Chief Information Officer (CIO), the Chief Financial Officer, the Chief Procurement Executive, and such other officials as the Managing Director may designate. The Managing Director or his designee shall chair and administer the Executive Review Committee.

### **Individual and Group Roles and Responsibilities**

The roles and responsibilities of the designated person or group are defined as follows:

- **Chief Information Officer (CIO)** – The CIO is a member of the Steering Committee. The CIO is the senior IT official in the FCC and has direct oversight of the ITSP. The CIO is responsible for overseeing execution of the processes for implementing and updating the ITSP. The CIO (or designee) is also responsible for designating projects as “architecturally significant” (i.e., those that warrant oversight).
- **Deputy Chief Information Officers** – The Deputy CIO for Customer Service is a member of the Strategic Planning Council, and is responsible for keeping the IT Goals and Objectives aligned with FCC’s needs. The Deputy CIO for Technical & Support Services is a member of the Architecture Review Council, and is responsible for keeping the architecture as articulated in the ITSP aligned with the FCC’s IT policies and recommending updates to the ITSP that promotes current IT policies.
- **Customer Service Representatives (CSRs)** – The CSRs sit on the Strategic Planning Council and the Architecture Review Council. CSRs are responsible for ensuring that the ITSP meets the needs of their constituents (Bureaus and Offices and automated systems owners). CSRs shall be aware of their constituents’ concerns and address such issues when reviewing and recommending updates to the ITSP.

- **Group Chiefs (GCs)** – GCs are members of the Strategic Planning Council and the Architecture Review Council. GCs represent their respective groups within the ITC. GCs are responsible for recommending updates to the ITSP that are based on their group’s business and technical requirements and objectives. GCs shall make use of the technical expertise contained within their groups to keep the ITSP up to date with current and emerging technologies. The Chief of the Planning and Support Group serves as the liaison from the SPC to the SC. The Chief of the Network Development Group serves as the liaison from the ARC to the SC.
- **Bureau and Office Representatives (B/O Repts)** – B/O Representatives are members of the Strategic Planning Council, Architecture Review Council, and the Steering Committee. B/O Representatives are responsible for ensuring that the specific needs of their respective Bureaus and Offices are met by the ITSP. B/O Representatives shall solicit input from their constituents prior to Council assembly and shall be able to convey needs in terms of updates to the ITSP.
- **IT Security Officer** – The IT Security Officer is a member of the Strategic Planning Council and the Architecture Review Council. The IT Security Officer is responsible for reviewing and recommending IT security-related updates to the ITSP. The IT Security Officer shall stay abreast of emerging technologies and standards in the IT security arena.
- **Bureau and Office (B/O) Policy Liaisons** – B/O Policy Liaisons sit on the Steering Committee. B/O Policy Liaisons are responsible for ensuring that the recommended updates to the ITSP and proposed OMB budget submissions are aligned with B/O policies. A B/O Policy Liaison is familiar with the policies and business requirements of his/her B/O and understands how those policies are impacted by any proposed changes.
- **SPC Liaison** – The Strategic Planning Council Liaison (ITC’ Planning and Support Group Chief) is responsible for executing the SPC’s charter. The Liaison convenes the Council, prepares the Goals and Objectives update proposal, and defends the proposed updates and changes during the Steering Committee approval process.
- **ARC Liaison** – The Architecture Review Council Liaison is responsible for executing the ARC’s charter. The Liaison convenes the Council, prepares the baseline and target architecture update proposals, and defends the proposed updates and changes during the Steering Committee approval process.

## 7.4 IT Capital Planning and Investment Control

The Federal government is changing the way it budgets for Information Technology. Traditionally, Federal agencies budgeted for IT as they do for other expenses, using an annual cycle of the previous year's base adjusted for uncontrollable increases such as inflation, for programmatic initiatives, and for government-wide budget targets. But since the 1996 Clinger-Cohen Act, Federal agencies have been moving towards a formalized capital planning approach, where the entire life cycle costs and benefits of an IT investment are considered, and form the basis for annual budget decisions.

The FCC is in the midst of this transition to capital planning. The processes described in this chapter meet many of the requirements for an IT capital planning and investment control process, as required by the Clinger-Cohen Act and OMB Circular A-130. The FCC has drafted an IT capital planning and investment control process, as required by OMB Circular A-130. The capital planning and investment control process will:

- Utilize the process for assessing architectural compliance described in Section 7.6 of this plan.
- Utilize the Systems Development Life Cycle (SDLC) process for projects to which SDLC applies.<sup>3</sup>
- Serve as an information source and an analytical framework for the deliberations of the Steering Committee and the Executive Review Committee, as described in Section 7.3.1 of this plan.
- Be complementary to FCC's budget formulation and execution procedures, which are currently being developed by FCC's Chief Financial Officer.<sup>4</sup>

### **Budgeting includes two distinct activities:**

- "Budget formulation" is the process that leads to the budget submission to Congress.
- "Budget execution" is the process of allotting, spending and monitoring the appropriated funds, which is done in FCC through the "operating budget."<sup>5</sup>

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<sup>3</sup> FCC, *Systems Development Life Cycle User Guide*, located at [http://intranet.fcc.gov/omd2/mgmt/sdlc/Docs/userguide\\_fnl.htm](http://intranet.fcc.gov/omd2/mgmt/sdlc/Docs/userguide_fnl.htm)

<sup>4</sup> FCC, Associate Managing Director for Financial Operations, *Policies and Procedures Manual*, Chapter 2, Budget.

<sup>5</sup> "Operating budget" is equivalent to a "spending plan" as referred to in OMB Circular A-34. This usage of "operating budget" is not to distinguish from a capital budget, which is how the term is generally used.

For Information Technology investments, the timeline for budgeting activities is synchronized with updates to the ITSP so that the budget submission accurately reflects the FCC's current goals and objectives and supports the target architecture. The timeline for all activities related to implementing and updating the ITSP, including the IT Investment Plan, is presented in Section 8.7.

### **7.4.1 Budget Formulation**

The FCC receives its operating budget from Congressionally approved appropriations. The budget submission has two phases—the FCC budget submission to OMB for the next fiscal year and then the final FCC budget submission to Congress.

#### **Phase 1 – Submission to OMB**

The IT budget submission to OMB has the following steps:

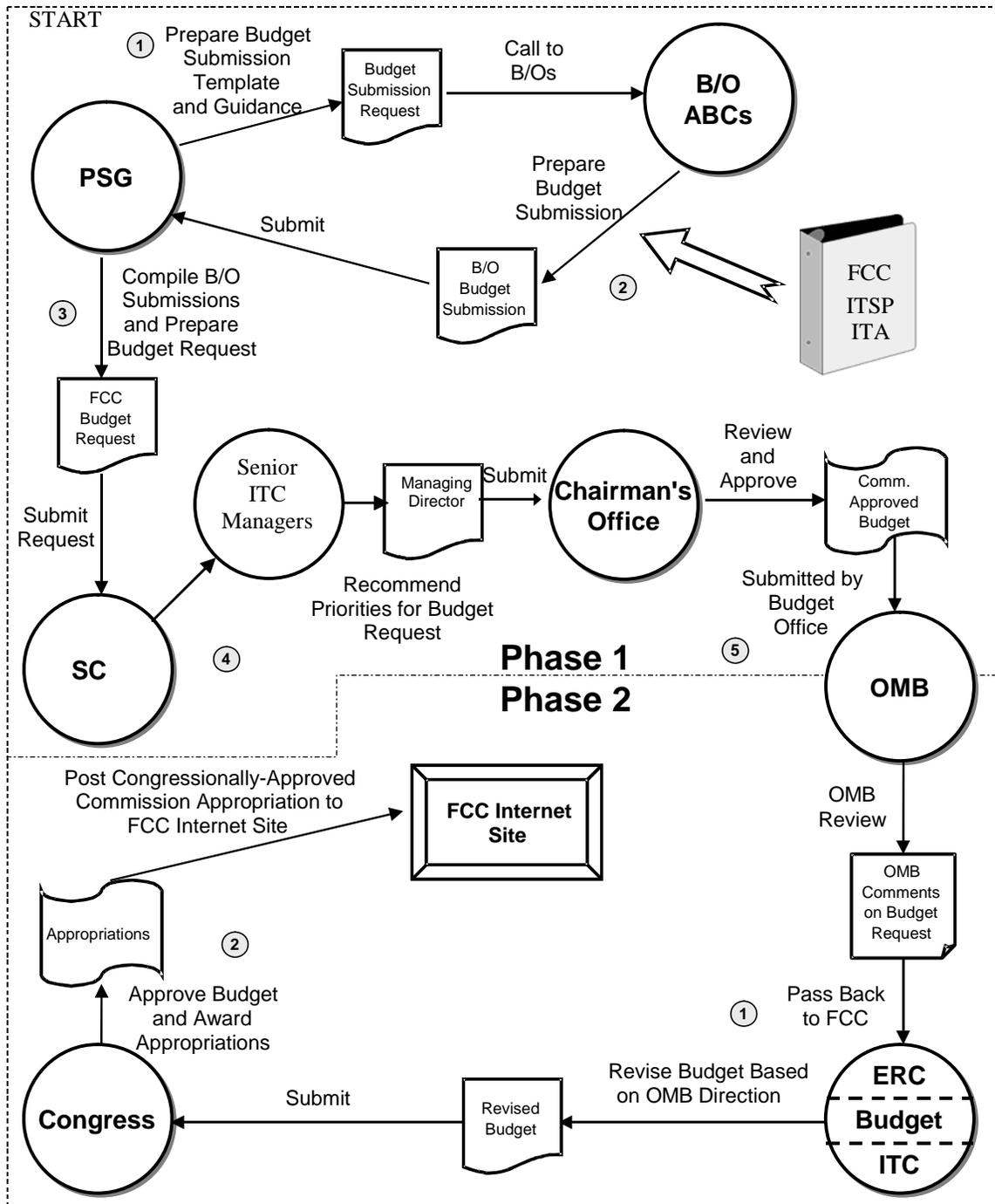
- The ITC's Planning and Support Group (PSG) prepares the next fiscal year's IT budget submission template and guidance for inclusion in the Office of the Managing Director (OMD) call to the FCC's Bureaus and Offices in the third quarter of the fiscal year (May). The call references current ITSP Goals and Objectives, current baseline architecture, and current target architecture. Bureaus and Offices are reminded to review and comply with the established Systems Development Life Cycle (SDLC) methodology before IT project cost estimates are developed.
- Each Project Manager prepares and submits through Bureau/Office management, a submission for his/her project, showing separately the funding levels required to:
  - continue any development, modernization or enhancement efforts that are already underway, and
  - undertake any new development, modernization or enhancement efforts.
- After review by senior ITC managers, the PSG prepares draft IT budgets and submits to the Steering Committee (SC), chaired by the CIO with senior management participation, in the fourth quarter of the fiscal year (July).
- The SC reviews the draft IT budget and recommends priorities. The budget and recommended priorities are then reviewed by senior ITC managers and submitted to the Managing Director. The Managing Director submits the budget to the Chairman's Office. (August).
- Once approved by the Commission, the FCC's Budget Center submits the overall agency budget submission to OMB in September.

**Phase 2 – Submission to Congress**

The FCC budget submission to Congress has the following steps:

- The Executive Review Committee, comprised of senior FCC executives is responsible for prioritizing the IT operating budget and re-working the annual IT budget submission as warranted. The Budget Center and the ITC receive the passback from OMB, make recommended changes (November), and forward budget submission to Congress for approval in the second quarter of the fiscal year (January).
- The status of the current year Congressionally-approved Commission appropriation (along with prior year and budget year requirements) is posted to the FCC’s Internet site.

The following diagram shows the flow for the FCC’s IT budget formulation process.



### 7.4.2 Budget Execution

After appropriations approval from Congress, the Commission’s IT operating budget is established. The process is as follows:

- Once Congress has approved the Commission’s appropriation for the current fiscal year, the Budget Center and PSG, depending on the overall funding level, may send out a call to Bureau and Office management for re-prioritized IT funding requests that map to both the FCC and IT Strategic Plans. The call includes reference to the current IT Goals and Objectives and Baseline Architecture. (November)
- Bureau and Office management prepare submissions—referencing both Strategic Plans (i.e., Commission and IT) and providing total system life cycle cost estimates. (December\*)
- PSG prepares the proposed IT operating budget. (December\*)
- ITC sends the proposed IT operating budget to the Executive Review Committee (ERC) for prioritization. (December\*)
- The Managing Director submits the proposed IT operating budget to the Chairman’s Office for approval. (December\*)
- Budget Office allocates funds as approved. (December\*)
- Before the CIO authorizes use of funds for a project, the Project Manager shall submit to the CIO a project plan that includes:
  - A statement of the requirements the project must satisfy.<sup>6</sup>
  - A preliminary Work Breakdown Structure that divides the work necessary to satisfy the project’s requirements into tasks.<sup>7</sup> The preliminary Work Breakdown Structure must show the complete project from start to end, but it may use broad tasks that will be broken down into more specific tasks as the project progresses. The Work Breakdown Structure must specify who will perform each task (for example, FCC employees in a particular organizational unit, or a vendor). The level of detail of the preliminary Work Breakdown Structure should be sufficient to demonstrate the feasibility of fulfilling the project’s requirements within the planned budget and schedule.

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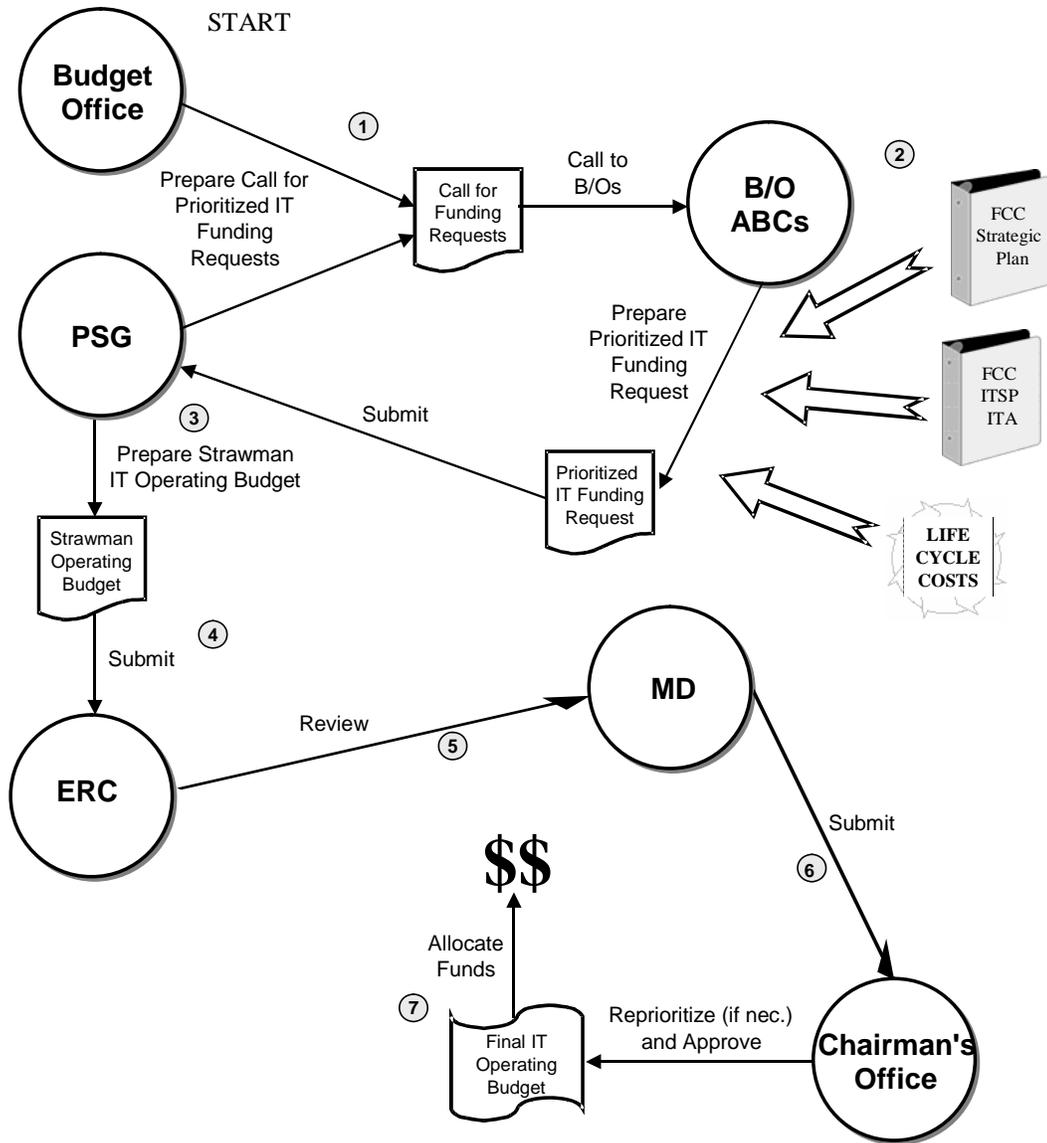
\* The timing of these steps may vary from year to year, based on the timing of Presidential and Congressional actions in the budget process.

<sup>6</sup> This statement of requirements corresponds to the Statement of Work as defined in Section 3.1 of standard ANSI/EIA-748 *Earned Value Management Systems*. The scope that is specified in the statement of requirements must constitute a “useful segment” of a capital project, in accordance with OMB Circular A-11, Section 300.

<sup>7</sup> The Work Breakdown Structure should conform to section 3.2 of standard ANSI/EIA-748 *Earned Value Management Systems*.

- A schedule showing the planned start date and completion date for each element of the Work Breakdown Structure, and any pre-requisite relationships among the elements. The schedule may also show additional milestones for use in measuring the progress of the project.
- A budget showing the total expenditure for goods and services for each element of the preliminary Work Breakdown Structure, and the planned division of funding for these expenditures between the FCC's appropriated funds, auctions cost recovery, and any other sources.
- The other resources required for the project, including work-hours from FCC employees and usage of FCC information technology infrastructure.

The following diagram shows the flow for developing the FCC's operating budget process.



## 7.5 IT Project Planning

IT projects must have budget approval to exist. A critical element of budget approval is compliance with the ITSP's technical architecture and standards profile. A fundamental step in advance of the operating budget approval process, and preferably prior to the OMB IT budget submission process, includes determining if current and potential projects are in harmony with the target architecture. This exercise is a fundamental part of the project planning process and is accomplished by evaluating proposed projects using the architectural evaluation factors explained in Section 7.5.1. The architectural evaluation factors are used to gauge the satisfaction of ITSP requirements.

## **7.5.1 Architectural Evaluation Factors**

The ARC will develop architectural evaluation factors that will be used to assess proposed IT initiatives in the post-requirements phase. The architectural evaluation factors identify a set of technical characteristics for analyzing system designs to provide insight into the ability of a proposal's technical solution to operate in a forward-looking and standards-based environment. Evaluation factors provide a method for assessing the degree to which projects conform to the standards and guidelines articulated by the target architecture. Architecture evaluation factors are also used to determine the degree to which a project's architecture conforms to the Commission's strategic goals and objectives.

Each project must address the evaluation factors and provide evidence that they are capable of meeting the intent of the assessment criteria. The key factors for achieving architectural commonality within the FCC are interoperability, use of standards and approved products, and the impact on the Commission's infrastructure, security practices, as well as the Commission's goals and objectives.

### **7.5.1.1 Interoperability**

Interoperability describes the degree to which a project supports data exchange and integration with other FCC systems and applications. The project team must identify the availability and intended use of technologies that promote interoperability and any needs that might hinder interoperability. To assess the extent of an initiative's interoperability within the FCC, the project team must do the following:

- Identify the availability and intended use of communications facilities, protocols, gateways, application programming interfaces (APIs), middleware, and toolkits.
- Identify characteristics that are intended to isolate products from proprietary vendor features.
- Identify how the investment has (or does not have) the capability to operate internally or externally to the Commission.
- Determine if the initiative advances, or at least maintains, the Commission's interoperability capabilities through its technologies, products, and processes.
- Assess the need for special protocols, formats, translation gateways, data reformatting, and transformation devices.

Evaluating these issues will provide insight into the initiative's potential degree of interoperability throughout the Commission.

### **7.5.1.2 Use of Standards and Products**

Investigating an initiative's use of standards and products reveals the extent to which its overall design and individual system hardware, software, and communications elements comply with applicable standards and products. The project team must identify relevant standards, map them to the infrastructure layers and justify any discrepancies. In order to fully understand an initiative's use of standards and products, the project team must do the following:

- Identify relevant standards associated with proposed hardware and software and map them to the information, communications, processing, and security infrastructures.
- Identify and justify discrepancies such as proprietary (non-standards-based) interfaces, formats, tools, and methods.

By doing this, the project planning team will have an understanding of the degree to which the initiative is likely to be compliant with the target architecture.

### **7.5.1.3 Impact on the Commission's Technology Infrastructure**

Studying an initiative's impact on the Commission's technology infrastructure provides insight into a project's ability to use shared computing and communications resources. It also shows the impact the design has on the capabilities of the infrastructure's common elements. To assess the extent of a project's impact on the Commission's technology infrastructure, the project team must do the following:

- Describe the ability to use shared computing and communications resources such as networks, software, hardware, applications, and administration.
- Identify the capacity and utilization requirements for storage, processor, and communications bandwidth of existing or planned infrastructure elements and platforms.
- Identify requirements and plans for sharing common processing resources and facilities.

Following these steps equips the project planning team with a detailed understanding of whether the initiative will fit within the current capabilities of the Commission technology infrastructure.

#### **7.5.1.4 Security Practices**

An in-depth look at security practices indicates the level at which a project supports secure access, exchange, and processing of data. The project team must identify relevant security standards and map them to the security infrastructure layer. As with the other infrastructure practices, any exceptions or discrepancies must be fully justified. To assess the extent to which a project adheres to the security practices of the architecture, the project team must do the following:

- Determine if the initiative advances, or at least maintains, the Commission's information security capabilities.
- Understand the impact of the design on capabilities and capacities of the common elements of the FCC's security infrastructure.
- Identify user communities, data classes, sensitivity, system interfaces, security risks, and a risk migration approach.
- Identify and justify discrepancies like proprietary (non-standards-based) protocols and encryption techniques.

Doing this ensures that the initiative will not weaken the Commission's security infrastructure by undermining its security practices.

#### **7.5.1.5 Impact on the Commission's IT Strategic Goals and Objectives**

Evaluating an initiative's impact on the Commission's IT Strategic goals and objectives establishes its level of support for the goals and objectives. To accomplish this, the project team must do the following:

- Determine which goals, objectives, and strategies the initiative supports.
- Understand to what extent an initiative will satisfy an objective or multiple objectives and their corresponding strategies when implemented.
- Identify and justify any aspects of the initiative that do not directly support stated IT goals, objectives, and strategies.

Doing this will help the project team identify the initiative's impact on the Commission's IT Goals and Objectives.

### **7.5.1.6 Future Architectural Evaluation Factors**

Architectural evaluation factors will continue to develop in an iterative process as technology changes and as needs arise. The architectural evaluation factors will be revisited and updated as part of the target architecture update process (see Section 8.4).

#### **Architecturally Significant Projects**

As part of the IT project planning process, projects are assessed for “architectural significance.” The ITSP promotes interoperability, shared resources, and common solutions. In accomplishing these objectives, traditionally stove-piped systems will become inter-dependent. Architecturally significant projects are identified so that system owners understand how changes to their projects impact the FCC’s IT landscape. It is ultimately the CIO’s responsibility to designate projects architecturally significant. An architecturally significant project is one that:

- Implements commonly used IT services (e.g., approach or solution, standards, and products can be applied to other Bureaus and Offices)
- Implements shared IT infrastructure services
- Establishes standard methods for cross-system interfaces and communications
- Involves, or directly affects, multiple Bureaus and Offices

## **7.6 Assessing Architectural Compliance**

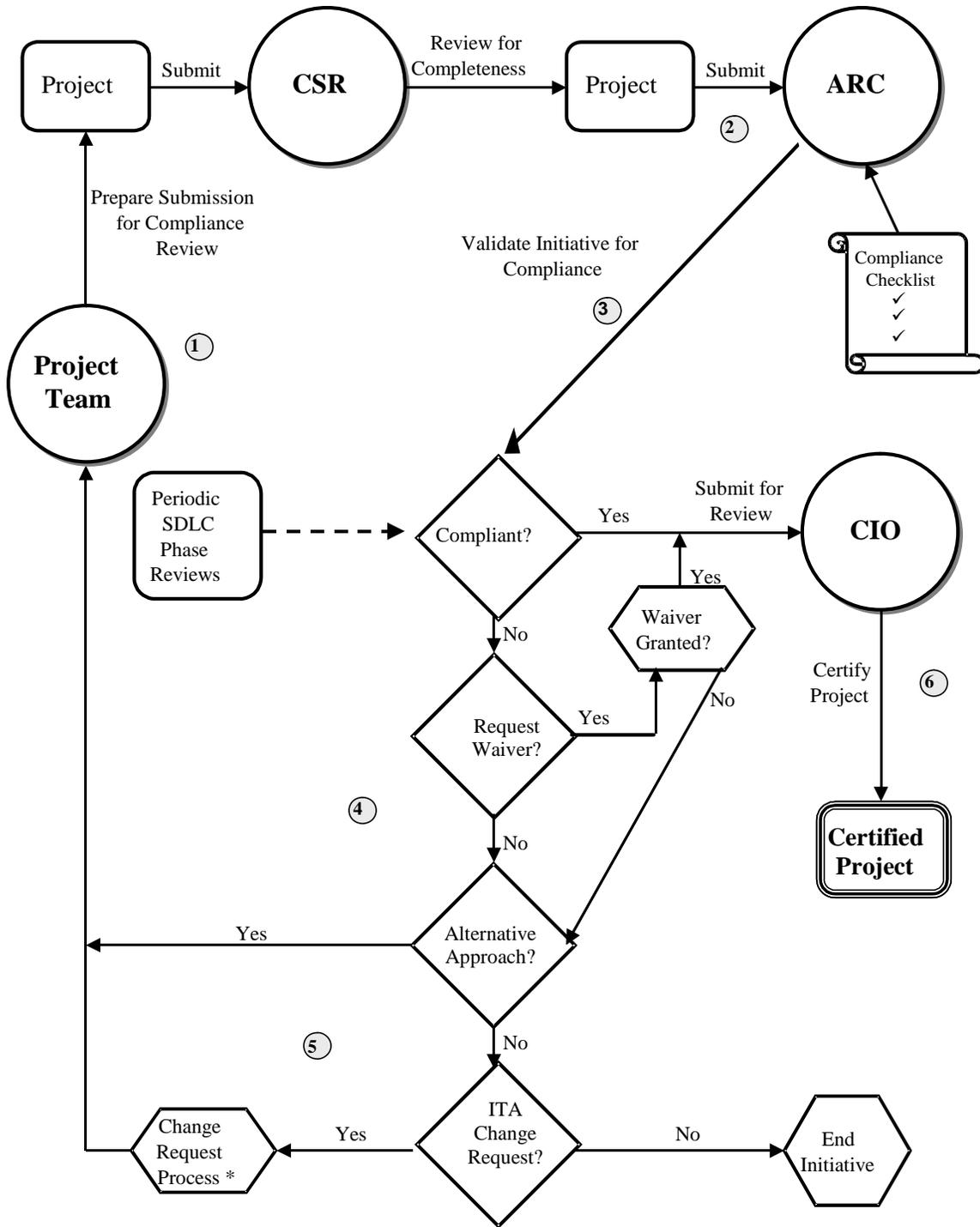
This section defines compliance in the context of the ITSP and outlines the processes for reviewing, maintaining, and managing project compliance. Section 7.1 identified several detailed actions that must take place to implement the ITSP. In conjunction with these activities, the ITC must review all proposed IT initiatives to assess their compliance with the ITSP. Initiatives that are not compliant will not necessarily be rejected or terminated. Non-compliant initiatives will be encouraged to develop a roadmap for achieving compliance, and may initiate changes to the target architecture.

### **7.6.1 Project Compliance Review Process**

All IT projects—current and proposed—are subjected to the compliance review process. The Architecture Review Council (ARC) reviews established projects on an annual basis. As new projects are submitted, they are first reviewed by ITC and then submitted to the ARC. The project review process is as follows:

- a. Modifications to Bureau and Office current systems and newly proposed initiatives are submitted to their Customer Service Representative (CSR). New initiatives are submitted after the project team has finished the IT project planning process as part of the SDLC. Projects which are already underway are re-submitted after any modification that could cause a deviation from the Technical Reference Model.
- b. The CSR reviews the submission for completeness and ultimately submits it to the ARC. If the submission is not complete, it is sent back to the system owner for revision.
- c. The ARC validates all initiatives using an pre-established compliance checklist and makes recommendation regarding compliance.
- d. If a project is deemed non-compliant (its requirements cannot be satisfied using the ITSPs technical reference model (TRM)), the system owner has three choices: (1) develop an alternative approach that is compliant, (2) prepare a waiver request, or (3) prepare a formal TRM change request.
- e. If an alternative approach is developed, this process must restart at step one. If a waiver is granted, the process continues to the next step. If the TRM is changed, then the process may continue to the next step, or may require revision of the proposal, depending on whether the existing proposal complies with the revised TRM.
- f. After the project is deemed compliant by the ARC (or waived), the CIO reviews the recommendation and certifies the project. (April)

The following diagram illustrates the compliance review process.



\* If an ITA change request is granted, then the project can be approved immediately if it complies with the ITA as changed. Otherwise, the project must be revised to comply with the existing ITA.

## **7.6.2 Compliance Checklist**

The compliance checklist is a device used by the Architecture Review Council (ARC) to ensure that all proposed initiatives are compliant and that all current projects remain compliant. This section shows how to set up the checklist to effectively measure projects against compliance criteria (goals, objectives, and standards). The compliance checklist contains the items listed below. Each item can be broken down into sub-categories for a more thorough review. It is the ITC's responsibility to disseminate the compliance checklist to system owners and project planners for use as a guide during IT project planning. The checklist should, as a minimum, ensure that:

- ✓ Documentation has been produced by the system owners justifying system compliance.
- ✓ Project requirements are satisfied by architecture standards.
- ✓ ITA-supported products are used to implement the solution.
- ✓ If project requirements cannot be met by the baseline or target architecture, the proper waivers have been obtained or the appropriate steps have been taken to obtain them.
- ✓ The project satisfies the Architectural Evaluation Factors. All initiatives must satisfy the requirements set forth by the architectural evaluation factors (Section 7.5.1). Although evaluation factors were developed for proposed initiatives, they also apply to current initiatives.

### **7.6.3 Waivers**

The ITSP recognizes that it cannot anticipate and accommodate every business requirement. It also recognizes that not all IT initiatives will be fully compliant. If a project's requirements cannot be satisfied using the ITSP's TRM, the project owner has three choices: (1) develop an alternative approach that is compliant, (2) prepare a waiver request, or (3) prepare a formal TRM change request. Preparing a waiver request is discussed in this section. The waiver process provides a vehicle for non-compliant, but mission critical, projects to be implemented at the Commission. A waiver may be issued on the following grounds:

- a. The requirements of the project cannot be met by the existing standards and products.
- b. Adherence to the existing standards and products would not be cost effective over the life of the project.
- c. New standards, platforms, or products have become available that can provide more cost-effective solutions in support of requirements.

Under any of these circumstances, a waiver request must be developed that details the reasons for the request and specifies any infrastructure upgrades and estimated costs that might be needed to accommodate the project. In addition, the long-term support obligations for the new product must be clear. Waivers do not apply to the ITSP goals, and objectives—these must be unconditionally adhered to.

The waiver request must identify:

- Project business requirements that cannot be supported by the IT architecture.
- The reason current information technology standards or products do not meet the needs of the project in areas such as conflicts with standards, conflicts with platform or communications requirements, or conflicts with products.
- The proposed approach and information technology standards or products
- The proposed approach to complying with the security infrastructure
- The proposed approach to support interoperability within the Bureau or Office and across the Commission
- Cost and support ramifications and explanation of the way in which sustaining life cycle support requirements will be met.

The IT architecture strives to build a common automated information systems infrastructure through products widely supported within the ITC and FCC. Without the framework provided by the architecture, the Commission would be supporting many disparate and incompatible products, thus constraining interoperability and information sharing within the Commission and with its constituents and increasing support costs.

The support plan for the project receiving the waiver is used to recognize and place support responsibility for unique operational requirements arising as a consequence of architectural nonconformance. The Support Plan includes:

- A description of the product to be supported
- Life cycle support approach
- Duration of required support
- Support cost projections and funding sources for:
  - Initiation
  - Requirements
  - Design
  - Development
  - Testing
  - Installation
  - Training
  - Operation
  - New releases/revisions
  - Maintenance
  - Other, as required.

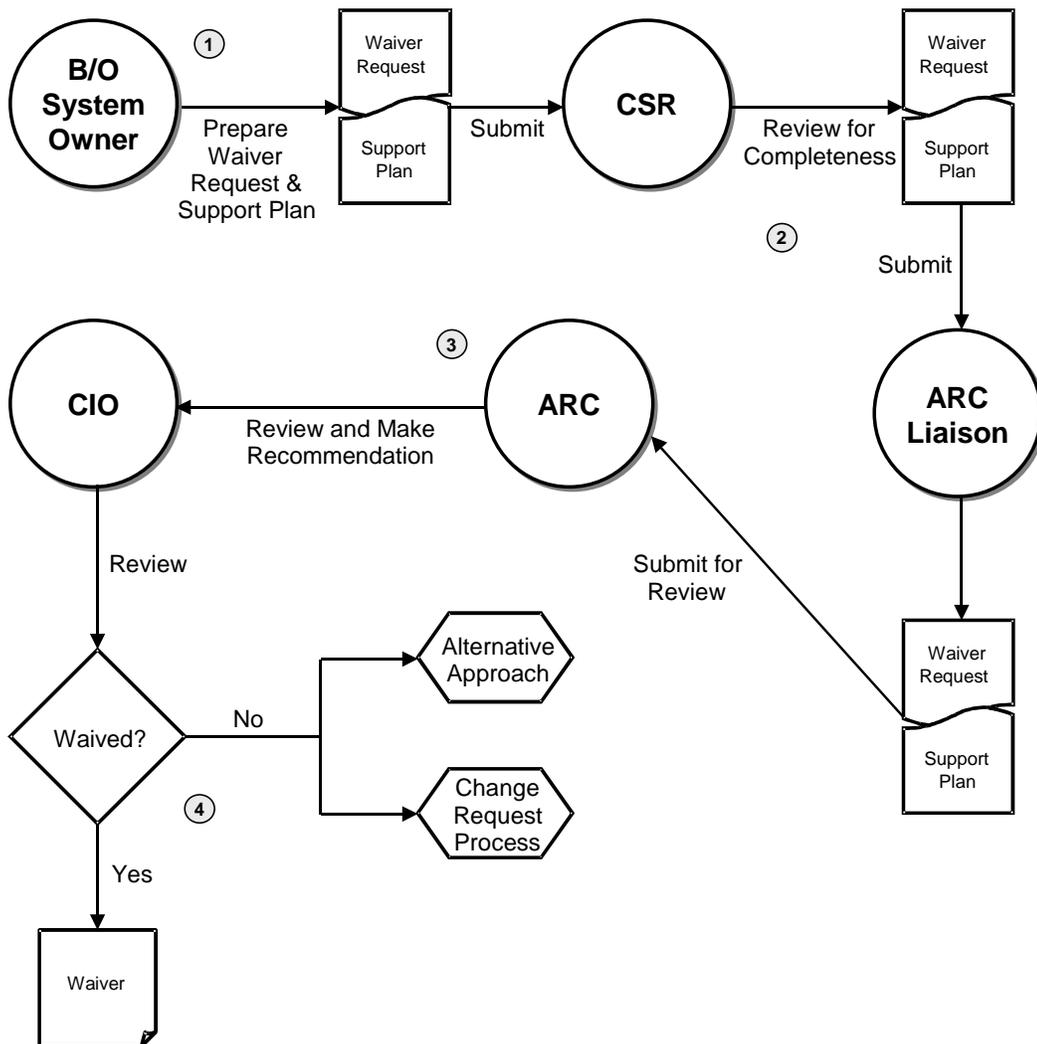
The waiver request, support plan, and the ARC recommendation will be reviewed in conjunction with project proposals submitted through the SDLC process.

**The waiver request and approval process is as follows:**

- a. The requesting Bureau or Office, or system owner, submits the request and Support Plan through his/her CSR for processing. The waiver request identifies why the project cannot comply with the IT architecture and outlines its proposed implementation approach. The support plan establishes the long-term plan for support obligations and infrastructure upgrades that might be necessitated.

- b. The CSR checks the waiver request and corresponding support plan for completeness, with assistance from ITC staff, and submits it to the ARC Liaison for review when the ARC convenes.
- c. The waiver is reviewed by the ARC. The result of the review may be that the ARC concurs with the waiver request and recommends it be accepted, or that it does not and recommends the waiver not be permitted.
- d. The recommendation is passed to the CIO for a final decision. An accepted waiver recommendation allows the project to proceed based on a valid Support Plan.

Exhibit 7-4 presents the waiver request and approval process.



**Exhibit 7-4. The Waiver Request Process**

#### **7.6.4 ITSP Change Request**

Requesting a change to the ITSP can be done in lieu of filing a waiver request for a non-compliant initiative. ITSP change requests shall be made so that the basic architectural principles in the areas of interoperability, improved missions support and security are not compromised. Proposals to modify the ITSP shall include:

- A description of the mission need addressed by the new services, technologies, and standards introduced
- A definition of the proposed modifications to the architectural principles, Technical Reference Model, services, and/or standards
- An analysis of the industry environment that supports the premise that the proposed modifications will keep FCC in the mainstream of current technological trends, including an assessment of viable alternatives
- An analysis of impacts to the existing FCC processing, communications, and security infrastructure and, as appropriate, implementation plans to realize the proposed change

A change request is filed with the CSR, who reviews it for completeness and submits it for ARC review. The ARC reviews change requests quarterly, and upon approval, updates the TRM (see Section 8.4 for details on this process).

8

# Updating the Information Technology Strategic Plan

## 8.1 Overview

The ITSP must be evolutionary. It must provide guidelines to FCC Bureaus and Offices and system developers for building information systems that are increasingly interoperable and migrate toward a single vision for enterprise-wide mission support. This section defines the process for maintaining the ITSP to ensure that the architecture will continue to be relevant in the face of rapidly changing technology and Bureau and Office needs.

Information gathering, evaluation, and distribution are central to accomplishing the mission of the FCC and its Bureaus and Offices. At any instant in time, there will be some IT systems in each of the phases of the SDLC. As the IT systems in use or in development go through changes, the ITSP itself—being a definition of standardized services, trade and industry standards, and products—must be periodically upgraded to reflect the current state of information and communications technology.

The ITSP must be kept up-to-date to provide value to the Bureaus and Offices and projects. It must reflect the impact of the following types of changes:

- **Architectural Design Guidelines.** Experience shows that design guidelines adopted by an organization change over time due to changing regulatory, organizational, mission, and user environments. Because the ITSP guidelines are fundamental to the implementation of the architecture, the impact of such changes on the ITSP must be regularly reviewed and addressed.
- **New Technology.** Information systems technology is changing rapidly, often in ways that cannot be predicted. As technology evolves, trends and changes should be monitored, and new products should be evaluated for their applicability to the ITSP.
- **New or Revised Standards.** Standards organizations are actively adding to and changing the body of consensus-based standards. The emerging internationalization of IT standards is further stimulating reconciliation and acceleration of standardization activities. Standards already selected in the ITSP need to be monitored for changes and obsolescence, while emerging standards should be tracked and assessed regularly for inclusion in the ITSP.

- **New or Revised User Requirements.** User expectations and needs are primary drivers in determining the services an architecture must provide and in selecting products to implement them. In the dynamic environment of the FCC's Bureaus and Offices, user requirements evolve quickly. The business demands of users, mission systems, and constituents must be evaluated frequently to assess their impact on the ITSP.

All three major segments of the ITSP—the IT Strategic Goals and Objectives, the Baseline Architecture, and the Target Architecture—are to be reviewed periodically for potential updates. The IT Strategic Goals and Objectives will be updated as needed to reflect new initiatives, Government mandates, changes in the communications industry, and reprioritization of FCC initiatives. The baseline architecture will be updated as needed to reflect changes in the FCC's IT landscape. The target architecture will be updated as needed to reflect individual Bureau and Office project requirements, to keep current with technology, and to reflect new Commission business needs identified in each update to the IT Strategic Goals and Objectives.

This section presents the processes for updating the ITSP. The timeline for all activities related to implementing and updating the ITSP is presented in Section 8.7.

## **8.2 Roles and Responsibilities**

Please see Section 7.3 for defined roles and responsibilities within the FCC (ITC and Bureaus and Offices) in the context of implementing and updating the ITSP.

## **8.3 Updating the IT Strategic Goals and Objectives**

The Strategic Planning Council (SPC) periodically reviews and recommends revisions to the IT Goals and Objectives. Updating the IT goals, objectives, and strategies occurs after mapping them to the FCC business strategic goals. The process for updating the IT Goals and Objectives is as follows:

- The SPC Liaison (PSG Group Chief) puts out a call to SPC members to convene a session during January of each year.
- The SPC meets, reviews, and updates goals, objectives, and strategies and forwards the revised Strategic Goals and Objectives proposal to both the Steering Committee (SC) and the Architecture Review Council (ARC) Liaison. The SPC Liaison is responsible for preparing the proposal.
- The SC reviews the proposal and either accepts or rejects it (March). The SPC Liaison briefs and responds to questions posed by Committee members.

- The SPC Liaison notifies SPC members of the SC’s decision, ensures the ITSP is updated by April to accommodate budget submission to OMB, and forwards updated ITSP to the ARC Liaison.

The IT Goals and Objectives update process is illustrated in the following diagram.

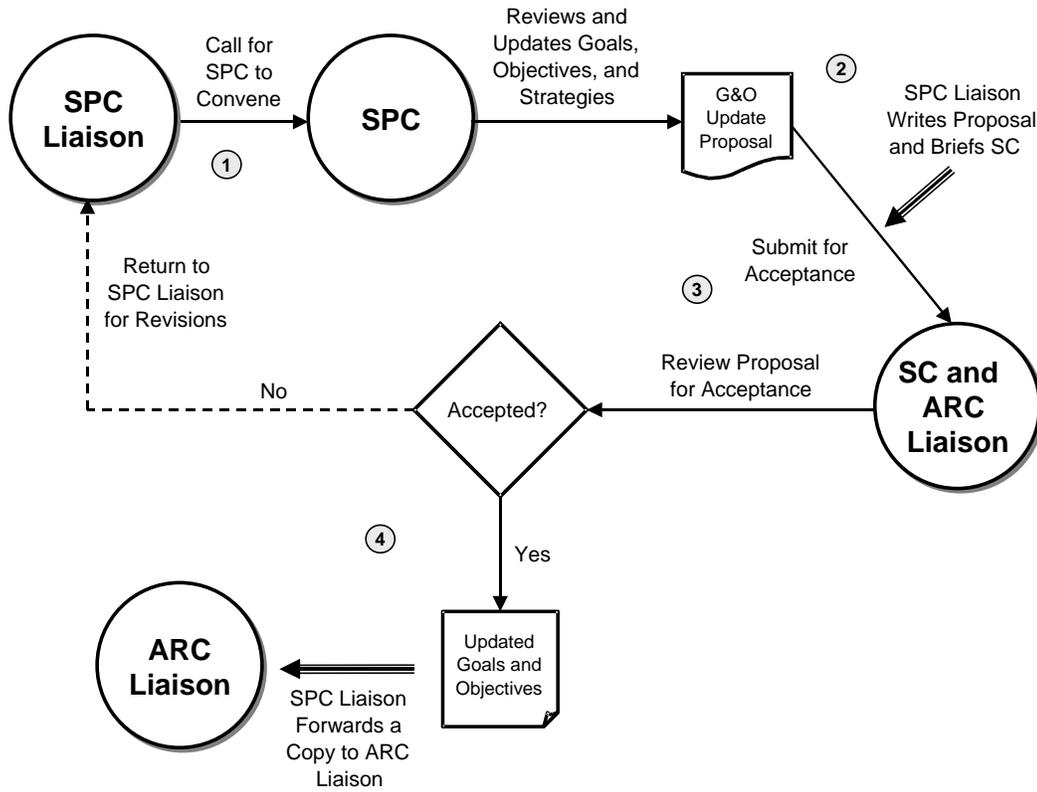


Exhibit 8-1. Updating the IT Strategic Goals and Objectives

## **8.4 Updating the IT Architecture**

The Architecture Review Council periodically reviews and recommends revisions to the target architecture as defined in the ITSP. The updating of the ITSP includes the baseline architecture and the target architecture.

## **8.5 Updating the Baseline Architecture**

As the FCC ITSP evolves towards its target, the baseline must be updated to reflect changes to the four infrastructures.

The steps for updating the baseline architecture are:

- The CSRs and the Deputy CIO simultaneously put out calls to their customers, ABCs, and Group Chiefs, respectively, requesting proposals to change, add to, or seek waivers from, the baseline architecture in the first and third quarters of the year. Submissions are sent to the Architecture Review Council (ARC) Liaison.
- The ARC Liaison calls a meeting of the ARC, which reviews, prepares, and submits a draft revised baseline architecture proposal to the CIO for approval (or rejection) in the first and third quarters of the year. The ARC Liaison is responsible for preparing the proposed baseline architecture proposal and briefing the CIO.
- The CIO approves (or rejects) proposed architecture changes and waivers.
- Rejected items are sent back to the ARC for negotiation with Bureau and Office representatives, CSRs, and Group Chiefs. Appeals are sent to the CIO and if necessary can be escalated to the Managing Director.
- The ARC Liaison updates the baseline architecture and sends copies to ABCs, ITC, and the Contracts and Procurement Center (CPC) as support for IT acquisitions in second and fourth quarters of the year.

**The baseline ITA update process is illustrated in the following diagram.**

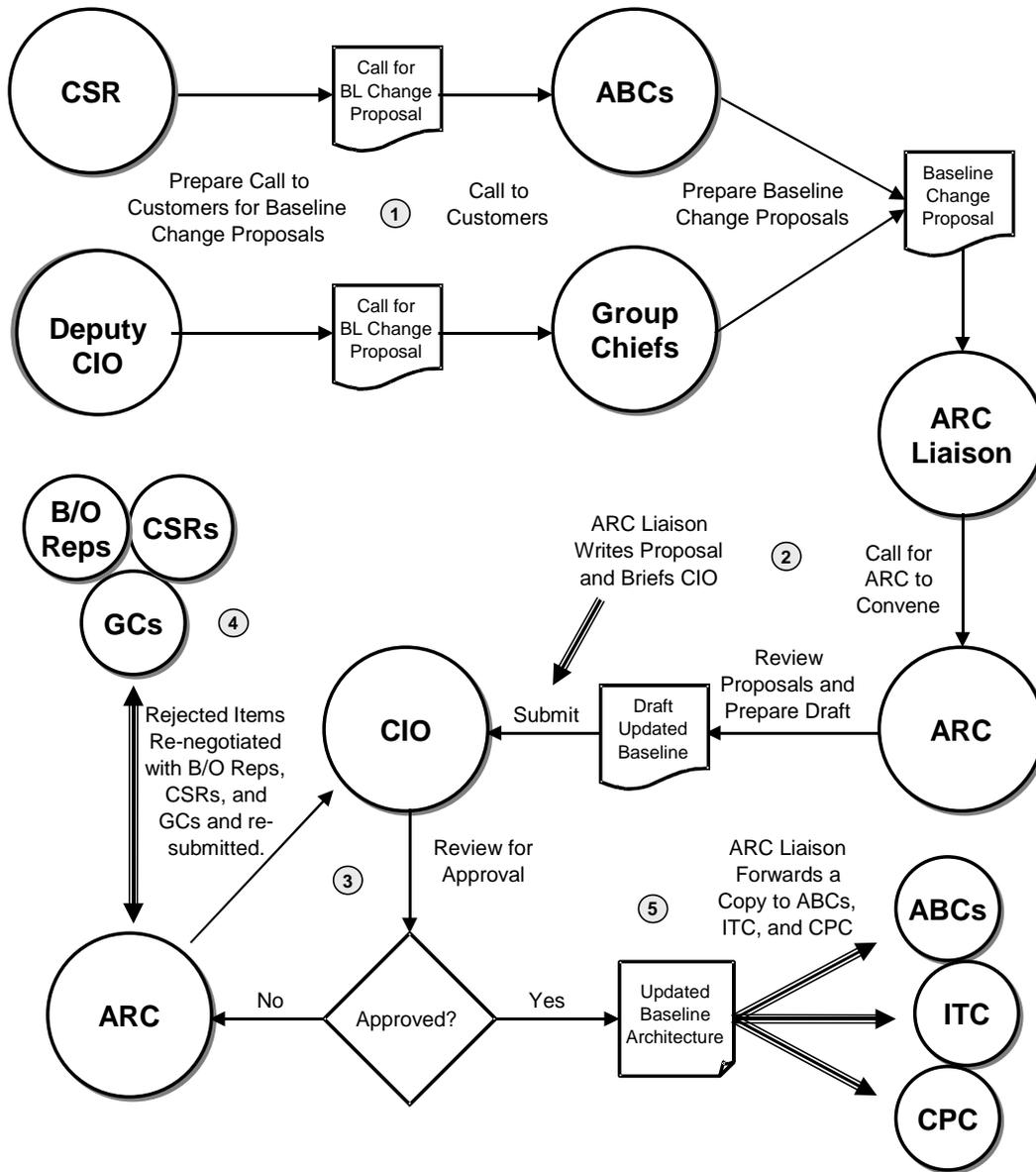


Exhibit 8-2. Updating the Baseline Architecture

## 8.6 Updating the Target Architecture

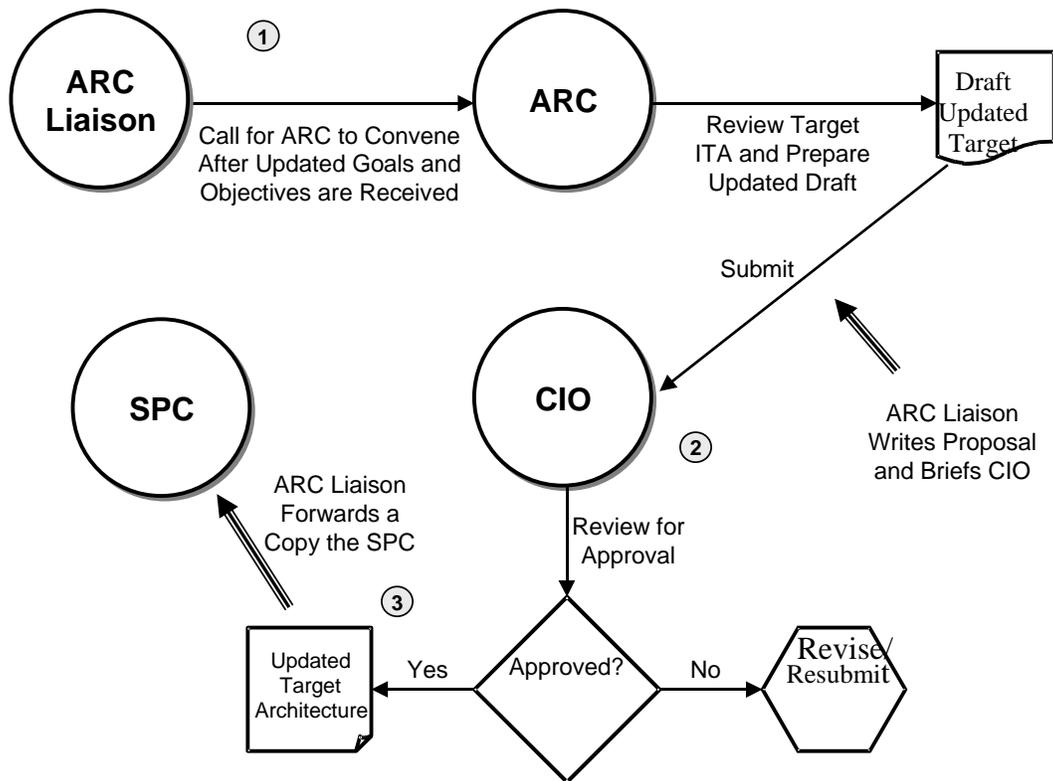
Recommended updates to the target architecture can be of three types:

- New service in the TRM – the results of a requirement that the architecture does not address
- New protocol, standard or preferred product
- Change to an existing protocol, standard, standard version number, or product

**The steps for updating the target architecture are:**

- Once the Architecture Review Council (ARC) Liaison receives the updated IT Strategic Goals and Objectives, a meeting of the ARC is convened in which the TRM, including the services and standards, is reviewed and updated as needed to support the ITSP. The proposed target architecture is forwarded to the CIO. The ARC Liaison is responsible for preparing the proposal. (April)
- The CIO reviews the proposal and either accepts or rejects it (May). The ARC Liaison is responsible for briefing CIO and responding to questions.
- The ARC Liaison notifies ARC members of the outcome, ensures the ITSP is updated in time for OMB budget call in May, and forwards updated ITSP to the SPC for information.

**The target ITA update process is illustrated below.**



**Exhibit 8-3. Updating the Target Architecture**

## **8.7 IT Strategic Plan, IT Budget, and IT Architecture Timeline**

Managing IT initiatives requires coordination of four related, but distinct, disciplines: 1) Strategic Planning and Architecture Management, 2) Systems Development Life Cycle, 3) Project Management, and 4) IT Capital Planning.

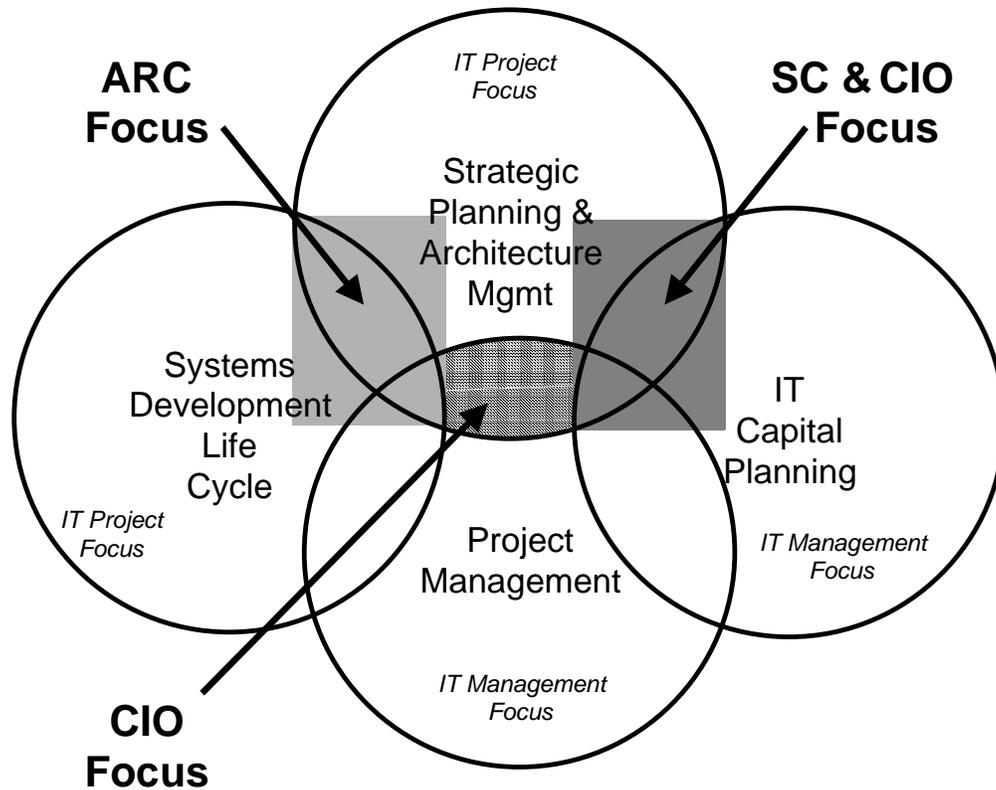
Strategic Planning and Architecture Management define the organization's near- and longer-term IT goals and objectives, and the strategies, guidelines, and standards for advancing toward them. The architecture management portion of this activity ensures the technical architecture remains viable and that Bureaus and Offices develop systems in harmony with the supported standards and implementation approaches.

The SDLC is a process for managing software development and integration style projects. The SDLC provides the rigor to ensure proper documentation is developed and specific activities occur during the course of the implementation. However, not all IT initiatives involve development. For example, a business process reengineering initiative that documents "as is" and "to be" business processes and data relationships involves IT but isn't development, so it wouldn't necessarily be bound by the SDLC process. Development of the SDLC is an effort separate from the ITSP.

Project Management provides the necessary diligence and oversight required for managing all types of projects and ensuring they are on schedule, within budget, and satisfying their requirements. Project Management also involves knowing when to terminate a project.

IT Capital Planning determines whether to undertake a project, aids in developing budgets and funding sources, and conducts project follow-up (post-implementation) surveys to determine whether projects were effective in meeting their objectives. Capital Planning processes encompass activities related to justifying and appropriating operating funds as well as ensuring return on investment is supportable.

Exhibit 8-4 illustrates the relationship among these areas and also shows the relative interest of the Architecture Review Council (ARC), Steering Committee (SC), and CIO in these subjects. The ARC and project teams tend to be technically-driven and focus more on the Strategic Planning and Architecture Management and SDLC processes; while the emphasis of the project leaders, SC and CIO are on the Project Management and IT Capital Planning processes and issues. These subjects do overlap somewhat, as illustrated in the exhibit, making it difficult at times in their practical application to draw a clear line of where one ends and the other begins.

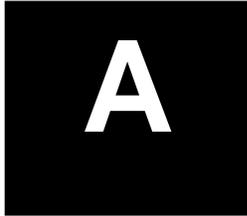


**Exhibit 8-4. IT Planning, Budget, and Technical Focus**

Exhibit 8-5 is a timeline for all processes related to updating the ITSP. The ITSP must be updated prior to OMB and Congressional budget submissions to ensure that current goals and objectives and the target architecture can be supported by the budget request. The Strategic Planning Council and the Architecture Review Council (ARC) must convene in the second quarter of each year to complete updates to the goals and objectives and the target architecture prior to the OMB budget submission. The ARC also convenes in the first and third quarters of each year to review and update the baseline architecture to support IT acquisitions in the second and fourth quarters of the year.

Activities	J	F	M	A	M	J	J	A	S	O	N	D
<b>ITSP Annual Update</b>												
SPC meets, reviews and proposes		X										
SC reviews proposals			X									
SPC updates ITSP & forwards to ARC Liaisons				X								
<b>Target IT Architecture Update</b>												
ARC meets, reviews and proposes			X									
CIO reviews proposals				X								
ARC updates Target Architecture					X							
<b>OMB Budget Submission</b>												
Budget/PSG budget call to B/Os					X							
B/O ABCs prepare budget submission						X						
PSG prepares draft IT submission							X					
SC reviews draft IT submission								X				
Budget Office submits budget to OMB									X			
<b>Congressional Budget Submission</b>												
Review OMB budget pass back											X	
Submits budget to Congress	X											
<b>Baseline IT Architecture Update</b>												
ARC meets, reviews and proposes				X						X		
CIO reviews proposals					X						X	
ARC updates Baseline Architecture						X						X
<b>IT Operating Budget</b>											X	
Budget/PSG call to B/Os											X	
B/O ABCs prioritize their budget requests												X
PSG proposes strawman budget												X
ITC sends budget strawman to ERC												X
ERC prioritizes and sends to OMD												X
OMD submits budget to Chairman's Office												X
Budget Office allocates funds												X

**Exhibit 8-5. ITSP Implementation and Update Timeline**



## Glossary

AAS	Auctions Automation System
ACMS	Automated Congressional Management System
AIG	Applications Integration Group
AITS	Automated Information Tracking System
ANSI	American National Standards Institute
API	Application Programming Interface
ARC	Architecture Review Council
ARMIS	Automated Reporting Management Information System
ASR	Antenna Structure Registration
ATM	Asynchronous Transfer Mode
B/Os	Bureaus and Offices
BLS	Broadband Licensing System
CAE	Common Application Environment
CCB	Common Carrier Bureau
CDBS	Consolidated Database System
CDMA	Code Division Multiple Access
CDPD	Cellular Digital Packet Data
CGI	Common Gateway Interface
CGM	Computer Graphics Metafile
CIB	Consumer Information Bureau
CIH	Calendaring Interoperability under HTTP
CIO	Chief Information Officer
CIP	Calendaring Interoperability Protocol
CLASPlus	Chairman's Lifecycle Agenda System
COALS	Cable Operations and Licensing System
COBOL	Common Object Business Oriented Language
CORBA	Common Object Request Broker Architecture
CORES	Commission Registration System
COSER	Canadian Co-channel Serial Coordination System
COTR	Contracting Officer's Technical Representative
COTS	Commercial off the Shelf
CPC	Contracts and Procurement Center

CRL	Certificate Revocation List
CRS	Cost Reporting System
CSAV	Command Software Anti Virus
CSB	Cable Services Bureau
CSR	Customer Services Representative
CSRS	Call Sign Reservation System
CTS	Cable Tracking System
DCE	Distributed Computing Environment
DES	Data Encryption Standard
DHCP	Dynamic Host Configuration Protocol
DMZ	Demilitarized Zone
DNS	Domain Name Service
EAS	Equipment Authorization System
EAS/TCB	Equipment Authorization System / Telecommunications Certification Bodies
EB	Enforcement Bureau
EBF	Electronic Batch Filing
ECFS	Electronic Comment Filing System
ECTF	Enterprise Computer Telephony Forum
EDI	Electronic Data Interchange
EDOCS	Electronic Document Management System
EES	Escrowed Encryption Standard
ELS	Experimental Licensing System
ERP	Enterprise Resource Planning
ESC	Executive Steering Committee
ETFS	Electronic Tariff Filing System
FCC	Federal Communications Commission
FDDI	Fiber Distributed Data Interface
FEAF	Federal Enterprise Architecture Framework
FIMS	Forms Interface Management System
FIP	Federal Information Processing
FIPS PUB	Federal Information Processing Standards Publication
FIRMR	Federal Information Resources Management Regulation
FOCUS	FCC Office Computer User Suite
FRN	FCC Registration Number
FTP	File Transfer Protocol
GC	Group Chief
GIF	Graphics Interface Format
GIS	Geographic Information Systems
GPEA	Government Paperwork Elimination Act

GPRA	Government Paperwork Reduction Act
GSSAPI	Generic Security Service API
GUI	Graphical User Interface
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
IB	International Bureau
IBFS	International Bureau Filing System
IC	Industry Canada
ICMP	Internet Control Message Protocol
IDEAS-PD	Procurement Desktop
IEEE	Institute of Electrical and Electronics Engineers
IETF RFC	Internet Engineering Task Force Request Comments
IGES	Initial Graphics Exchange Specification
ILEC	Incumbent Local Exchange Carriers
IMAP	Internet Message Access Protocol
IP	Internet Protocol
IPSEC	IP Secure
IRDS	Information Resource Dictionary System
ISAKMP	Internet Security Association and Key Management Protocol
ISDN	Integrated Services Digital Network
ISO/IEC	International Standards Organization / International Electrotechnical Commission
IT	Information Technology
ITA	Information Technology Architecture
ITC	Information Technology Center
ITMRA	Information Technology Management Reform Act
ITSP	Information Technology Strategic Plan
ITU	International Telecommunication Union
IVR	Interactive Voice Response
JPEG	Joint Photographic Experts Group
JTAPI	Java Telephony API
Kbps	Kilo-bits Per Second
KidVid	Children's Television System
LAN	Local Area Network
LDAP	Lightweight Directory Access Protocol
Mbps	Mega-bits Per Second
MIB	Management Information Base

MIME	Multi-Purpose Internet Message Extensions
MMB	Mass Media Bureau
MPEG	Moving Pictures Experts Group
MPOA	Multi-protocol over ATM
MPP	Multi-link Point-to-Point Protocol
MTBF	Mean Time Between Failure
MTS	Management Tracking System
MVPD	Multi-channel Video Programming Distributors
NAL	Novell Application Launcher
NARA	National Archives and Records Administration
NDG	Network Development Group
NDS	Novell Directory Services
NTIA	National Telecommunications and Information Administration
OA	Office Automation
OALJ	Office of Administrative Law Judges
OCBO	Office of Communications Business Opportunities
OCR	Optical Character Recognition
ODBC	Open Database Connectivity
ODMA	Open Document Management API
OET	Office of Engineering and Technology
OG	Operations Group
OGC	Office of General Counsel
OIG	Office of the Inspector General
OLIA	Office of Legislative and Intergovernmental Affairs
OMB	Office of Management and Budget
OMD	Office of Managing Director
OMR	Office of Media Relations
OPP	Office of Plans and Policy
OSCAR	Operations Support For Complaints Analysis Resolution
OWD	Office of Workplace Diversity
PDA	Personal Digital Assistant
PDF	Portable Document Format
PKI	Public Key Infrastructure
PNG	Portable Network Graphics
POSIX	Portable Operating System under UNIX
PPP	Point-to-Point Protocol
PPPoE	PPP over Ethernet
PSG	Planning and Support Group
RAID	Redundant Array of Inexpensive Disks
RAMIS	Revenue Accounting & Management Information System

RDBMS	Relational Database Management System
RMON	Remote Monitoring
ROSIE	Remittance Over Secure Internet E-Commerce
RTF	Rich Text Format
S/MIME	Secure Multi-Purpose Internet Message Extensions
SDLC	System Development Lifecycle
SGML	Standard Generalized Markup Language
SLIP	Serial Line Internet Protocol
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SONET	Synchronous Optical NETwork
SPC	Strategic Planning Council
SQL	Structured Query Language
SRB	Senior Review Body
SSL	Secure Socket Layer
TCP	Transmission Control Protocol
TIFF	Tag Image File Format
TRM	Technical Reference Model
UDP	User Datagram Protocol
ULS	Universal Licensing System
UUCP	Unix to Unix Copy
VoIP	Voice over IP
WAN	Wide Area Network
WAP	Wireless Application Protocol
WML	Wireless Markup Language
WTB	Wireless Telecommunications Bureau
XML	Extensible Markup Language

**B****Summary of IT Strategic Goals,  
Objectives, and Strategies**

The following summarizes the ITSP's strategic goals, objectives, and strategies.

**Goal 1: Implement customer-focused IT solutions to facilitate information exchange with the public and telecommunications industries.**

**Objective 1: Evolve FCC systems to respond quickly to industry and regulatory changes.**

**Strategies:**

- 1.1 Review process of Administration Resource Impact statement creation for realism/impact.
- 1.2 Create cross organization advisory team to respond to unplanned priorities.
- 1.3 Review current tools and create/maintain recommended development tools list (use outside expertise).
- 1.4 Create reserve hardware capacity for development and production purposes.
- 1.5 Identify critical systems that we now have and ensure that core systems can be responsive to changes that must be made quickly (i.e. can be quickly changed, non-proprietary system/software).
- 1.6 Create and maintain in-house implementation and maintenance expertise (FTE).
- 1.7 Create budget contingency fund for unplanned changes (no-year funds, allocated by advisory team).
- 1.8 Review and streamline process to hire technical support (contractor and in-house).
- 1.9 Review process of FCC's response to external legislative/policy directives.
- 1.10 Enforce system documentation (i.e. via implementing the SDLC).



**Goal 1**

- 1.11 Agency-wide application integration that highlights core sharing, data standardization, and data warehousing.
- 1.12 Create cross-organization technology review team for architecture duration, and develop experience sharing.
- 1.13 Review budget allocation and procurement process for speed. (i.e., can the process be accelerated?)
- 1.14 Create an outreach mechanism for early identification of requirements.

**Objective 2: Provide electronic filing in all cases where it is practicable.**

**Strategies:**

- 2.1 Define measures of success for reporting and performance assessment (e.g., what applications and types of filing does this apply to?).
- 2.2 Determine strategy on FCC Rulemakings (Bureau and Office specific or FCC wide) to make electronic filing mandatory.
- 2.3 Continual assessment of internal processes that will complement how we move to 100 percent electronic filing.
- 2.4 Continual assessment of IT infrastructure that will complement how we move to 100 percent electronic filing.
- 2.5 Develop capacity planning estimates based on best case (peak load) scenarios.
- 2.6 Staff planning that is proactive and based on movement toward 100 percent electronic filing.
- 2.7 Identify technologies and strategies to reduce cycle time for development and deployment
- 2.8 Do more rigorous schedule and risk estimates for specific electronic filing initiatives.
- 2.9 Implement critical electronic filing system enhancements that are customer driven (e.g. get customer feedback).
- 2.10 Implement formal capacity planning, contingency to make electronic filing system 100 percent reliable and available.
- 2.11 Foster enterprise perspective (agency-wide view) for common functions like mergers, fee payment.
- 2.12 Determine why public and industry can't do electronic filing 100 percent.

<b>Goal 1</b>
---------------

- 2.13 Assess FCC movement toward consolidating FCC systems to reduce data entry burden on applicants and provide a common interface.
- 2.14 Provide a regular forum for sharing problems and customer feedback across Bureau and Office electronic filing systems.
- 2.15 Implement appropriate levels of security and privacy for electronic filing systems to address customer concerns (e.g., digital signature).  
[Mandatory]
- 2.16 Pursue system enhancements for accessibility.  
[Mandatory]
- 2.17 Prioritize FCC electronic filing needs across the agency to determine which are 1) biggest bang-for-the-buck, 2) easiest to implement, 3) highest visibility.
- 2.18 Activate a change management program to orient and train FCC staff on electronic filing system – overcome resistance.

**Objective 3: Provide public access to FCC systems, information and customer service 24 hours a day, 7 days a week.**

**Strategies:**

- 3.1 Processing should be real-time.
- 3.2 Establish speed of service standards.
- 3.3 Communicate service results.
- 3.4 Assess speed-of-service, time and quality.
- 3.5 Enhance assistance for customer-user interface (chat).
- 3.6 Ensure redundancy.
- 3.7 Implement phone (IVR) for customer support – all input channels. (web, call center, application experts).
- 3.8 Enhance technical support; e.g. software to manage the help desk.
- 3.9 Study opportunity for a virtual reference center.
- 3.10 Develop archiving solution.
- 3.11 Improve access to graphical reference room.
- 3.12 Enhance enterprise-wide searchability.
- 3.13 Ensure accessibility.
- 3.14 Find out what the customers need – (Palm Pilot support, PDA, wireless).
- 3.15 Preserve traditional as well as automated support (human).



- 3.16 Adopt FCC-wide standardization of terms, tools, and navigation for Internet presence. Incorporate the standards into web templates and a style guide.
- 3.17 Create common interfaces for application at web level.
- 3.18 Improve monitoring and intrusion detection capability to support 24x7 access.
- 3.19 Remove impediment to non-English speaking customers.
- 3.20 Assess option for FCC staff to work 2<sup>nd</sup>, 3<sup>rd</sup> shifts, 24x7.
- 3.21 Provide a development web server.

## Most Significant Strategies for Goal 1

### Mandatory Items:

- 1. Implement appropriate levels of security and privacy for electronic filing systems to address customer concerns (e.g., digital signature).  
[Mandatory] [Strategy 2.15]
- 2. Pursue system enhancements for accessibility.  
[Mandatory] [from Strategies 2.16, 3.13]

### Ranked Strategies:

- 1. Enhance support infrastructure (such as systems, people, processes, high availability, contingency arrangements, monitoring facilities, specialized software) to make Electronic Filing and Public Access systems 100 percent available and reliable.  
[from Strategies 2.10, 3.6, 3.8, 3.20]
- 2. Develop a comprehensive program to enhance customer support for Electronic Filing and Public Access systems. (e.g., consolidated help desk/customer call center support, add on-line chat/Instant Messaging, Customer Relationship Management tools.) [from Strategies 3.5, 3.7]
- 3. Implement critical Electronic Filing system enhancements that are customer driven (get customer feedback.) [Strategy 2.9]
- 4. Create/evolve a set of agency-wide standards for FCC Electronic Filing and Public Access systems (e.g. end-user interfaces, development tools, data standardization, data warehousing, web based application and content, code reuse/sharing and common functions like mergers, fee payment.) [from Strategies 1.11, 2.11, 3.16, 3.17]



**Goal 1**

5. Incorporate agency-wide standards into templates and a style guide for FCC web pages. [Strategy 3.16]
6. Assess the FCC movement toward consolidating FCC systems to reduce data entry burden on applicants and provide a common interface. [Strategy 2.13]
7. Provide a regular forum for sharing customer issues, feedback and problems across Bureau and Office systems. [Strategy 2.14]
8. Implement early warning and planning system with advisory team to respond to potential regulatory changes incorporating the administrative resource impact (ARI) statement. [from Strategies 1.1, 1.2, 1.9]
9. Pursue innovative strategies to secure resources and allow flexibility to respond quickly to unforeseen requirements. [from Strategies 1.4, 1.7, 1.13]
10. Provide a development web server. [Strategy 3.21]

**Goal 2: Provide the IT infrastructure and productivity tools to enhance FCC staff's ability to execute their statutory responsibilities and mission.**

**Objective 1: Provide a common IT infrastructure for developing common solutions, while meeting specialized needs.**

**Strategies:**

- 1.1 Develop and implement an enterprise-wide dictionary for database applications.
- 1.2 Establish a library of sharable code.
- 1.3 Establish a review and approval process for additions or changes to established architecture.
- 1.4 Document all standards and common interfaces where they can be found easily. Enforce them for staff and contractors.
- 1.5 Assess user needs up front; articulate day-to-day needs beyond routine tasks (e.g., maps, and searches).
- 1.6 Enhance remote access for field users and other types of remote users; pursue best practices and state-of-the-art solutions (e.g., web, thin client).
- 1.7 Establish appropriate life cycle management program considering financial and technological impacts.
- 1.8 Measure total cost of ownership at desktop system, services.
- 1.9 Map FCC infrastructure to be able to plan for changes.
- 1.10 Streamline administrative processes and systems (employees).
- 1.11 Conduct a productivity analysis to identify opportunities to leverage IT for staff effectiveness.
- 1.12 Provide tools and training to support a cadre of desktop software experts in each Bureau and Office.

**Objective 2: Provide venues and opportunities for sharing information.**

**Strategies:**



- 2.1 Employ e-mail to inform FCC staff of hardware/software changes.
- 2.2 Reestablish Bureau and Office monthly information exchange meetings (DALO).

- 2.3 Schedule regular sessions on use of FCC databases and systems.
- 2.4 Create knowledge repositories available via electronic means (a la COTR Corner).
- 2.5 Host informal information exchange meetings (brown-bag lunches).
- 2.6 Create an electronic forum/bulletin board on the FCC intranet for topic-specific information exchange.
- 2.7 Schedule/host electronic chat sessions (FCC intranet; video, voice, real time, text).
- 2.8 Create internal FCC “list server” for parties to receive subject-related information electronically.
- 2.9 Produce a regularly scheduled newsletter (e-gram like) on systems, technical information.
- 2.10 Follow the SDLC for input to major systems by Bureaus and Offices.
- 2.11 Post system quarterly reports available to all FCC/CSRs to highlight interface opportunities (system development IT reviews).
- 2.12 Expand use of video streaming for desktop delivery of information.
- 2.13 Host CIO meeting (quarterly) on strategic and tactical items.
- 2.14 Produce an annual FCC CIO report of systems, infrastructure, progress on strategic plan, direction for next year (snapshot for reference).
- 2.15 Hold IT technical subject sessions featuring subject matter experts (internal, public, invited guests).
- 2.16 Identify links between System Owners/COTRs/Managers to foster information sharing.

**Objective 3: Establish and maintain defined processing and communications service levels.**

**Strategies:**

- 3.1 Create, define, and communicate agency-wide IT service level agreements in accordance with budgetary constraints and union rules that span the FCC (intra-bureau, inter-bureau, ITC/agency), e.g., outage notifications and restore service, Help Desk support, software distribution and impact).
- 3.2 Keep customers informed when contractual matters prevent meeting service levels.

- 3.3 Provide written feedback to Bureau and Office customers on meeting service standards.
- 3.4 Tie performance of responsible party to service level agreements (e.g., contract incentives, performance clauses, employee days off).
- 3.5 Where appropriate, align IT service level agreements with externally published standards.
- 3.6 Compile and publish key ITC point-of-contact information (e.g., core hours, after-hours contact procedures).
- 3.7 Using re-instituted DALO meetings to communicate customer service standards, and promises vs. results.
- 3.8 Establish a periodic review of service level standards to maintain currency.
- 3.9 Communicate status and expectations to individual customers.
- 3.10 Perform quality assurance surveys to assess success and quality of service.
- 3.11 Employ agency-wide solution to monitor, measure, and analyze service levels.
- 3.12 Assess and communicate infrastructure strengths, constraints, trade-offs, and possible alternatives where needed (e.g., firewall). [related to Objective 2]

**Objective 4: Provide technical solutions that improve data management.**

**Strategies:**

- 4.1 Implement the use of Geographic Information Systems (GIS) within the FCC.
- 4.2 Explore enterprise-wide (all data repositories) backup and archival process solutions.
- 4.3 Explore global shared drive concept.
- 4.4 Implement new techniques and methods to disseminate the information pertaining to the existing FCC database systems (demos, interactive, web-based, PowerPoint).
- 4.5 Explore new solutions that can provide a common interface and look and feel to the data sets.
- 4.6 Provide data links to the different FCC databases.
- 4.7 Explore web-based data delivery solutions (wireless access, accessibility issues).
- 4.8 Explore GroupWise solutions (group collaboration software).



**Goal 2**

- 4.9 Explore Server-based as opposed to client-based solutions.
- 4.10 Work to ensure there is a Bureau-level coordination of data assets (i.e., database data) (a liaison that knows where the Bureau or Office data is stored, a person inside the Bureau or Office that is knowledgeable concerning its IT functions and “stuff”).
- 4.11 Explore document management solutions (including version control).
- 4.12 Explore implementing an FCC-wide data dictionary.
- 4.13 Share data elements across different systems.
- 4.14 Ensure data systems are well documented.
- 4.15 Ensure that data within the administrative systems are linked “where appropriate” and accessible to authorized FCC personnel.
- 4.16 Explore the use of state-of-the-art software tools to access FCC data (internal and external).
- 4.17 Explore the use of web-based cookie technology to query internal FCC data.
- 4.18 Study options to reduce the number of software products that are used (balance between development flexibility and creating legacy systems).
- 4.19 Explore the expanded use of data warehousing.
- 4.20 Improve timeliness and accessibility of administrative systems.
- 4.21 Explore the use of document management tools that will provide ownership, creation, and modification date stamps, security permissions.
- 4.22 Expand the use of common interface models for putting together applications so they will inter-operate (industry standard common interface models).
- 4.23 Expand the use of optical jukebox systems for storage and retrieval services.
- 4.24 Communicate the existing records management policy (storage, archival, retention period).

### **Most Significant Strategies for Goal 2**

**Mandatory Items:**

None.

**Ranked Strategies:**



**Goal 2**

1. Work to ensure there is Bureau-level management of data assets and other IT functions (i.e., database data, a liaison that knows where the Bureau or Office data is stored, a person inside the Bureau or Office that is knowledgeable concerning its IT functions, redefine DALO responsibilities). [Strategy 4.10]
2. Create, define, and communicate agency-wide IT service level agreements in accordance with budgetary constraints and union rules (intra-bureau, inter-bureau, ITC/agency), e.g., outage notifications and restore service, Help Desk support, software distribution, and impacts). [Strategy 3.1]
3. Communicate service level impact and problem resolution status to affected customers (may be done on an exception basis only). [Strategy 3.9]
4. Develop and implement an enterprise-wide dictionary for database applications. [Strategy 1.1]
5. Continually assess the value and use of state-of-the-art software tools to access internal and external FCC data (e.g., cookies, data warehousing) and the use of web-based cookie technology to query internal FCC data. [Strategy 4.17]
6. Regularly assess user needs up front; articulate day-to-day needs beyond routine tasks (e.g., maps, searches, productivity tools). [Strategy 1.5]
7. Reestablish Bureau and Office monthly information exchange meetings (among DALOs and other Bureau and Office IT staff). [Strategy 2.2]
8. Streamline administrative processes and systems (e.g., personnel, timekeeping, procurement, etc.). [Strategy 1.10]
9. Plan and implement enterprise-wide backup and archival process solutions for all data repositories (e.g., optical storage). [Strategy 4.2]
10. Implement new techniques and methods to disseminate information pertaining to the existing FCC database systems (such as demonstrations, interactive sessions, web-casts, PowerPoint). [Strategy 4.4]
11. Create an electronic forum/bulletin board on the FCC intranet for topic-specific information exchange. [Strategy 2.6]
12. Conduct a productivity analysis to identify opportunities to leverage IT for staff effectiveness. [Strategy 1.11]

13. Provide tools and training to support a cadre of desktop software experts in each Bureau and Office. [Strategy 1.12]

**Goal 3: Provide innovative, responsible, flexible leadership to ensure successful FCC IT programs.**

**Objective 1: Clearly identify roles and responsibilities and build expertise to support IT programs.**

**Strategies:**

- 1.1 Develop and distribute a list of IT points of contact and backup with roles and responsibilities (on intranet by function for ITC and Bureaus and Offices) in key areas.
- 1.2 Determine required (project management) expertise for IT skill set. Assess current IT skills to identify gaps. (must be performed by FTE versus contractor.)
- 1.3 Ensure executive awareness, support, and participation in developing and using IT in the agency.
- 1.4 Clearly delineate FTE function, role and responsibility versus that of the contractor.
- 1.5 Manage IT knowledge, capture and share, and maintain access to lost knowledge.
- 1.6 Develop and present IT proposal to executives (alternatives, cost to implement versus cost not to implement in priority order).
- 1.7 Provide incentives (educational opportunities) to develop and maintain IT skills (ITC and Bureaus and Offices).
- 1.8 Ensure cross training for continuity of operations.
- 1.9 Reassess avenues for acquiring IT expertise other than contracting (interns, external hires, industry partnerships, inter-agency details).
- 1.10 Ensure access to new IT expertise prior to losing existing expertise.

**Objective 2: Define, use, and maintain an IT architecture.**

**Strategies:**

- 2.1 Periodic review by outside organization to evaluate the FCC IT architecture (ensure independence and publicize results).



- 2.2 Ensure that FCC IT architecture adheres to OMB guidance.
- 2.3 Centralize the configuration control plan of the FCC IT architecture to ensure that it is all encompassing (applies to all Bureaus and Offices).
- 2.4 Provide means for Bureaus and Offices to get new IT products and technologies added to the IT architecture.
- 2.5 Ensure the decision-makers are aware of the costs to the strategies and risk associated with implementing the strategies.
- 2.6 Develop a prioritization mechanism to implement new technology into the FCC IT architecture.
- 2.7 Create a detailed IT architecture mapped to business processes and funding sources.
- 2.8 Place highest priority on incorporating and maintaining high technology (reliable) backup systems.
- 2.9 Map the FCC IT architecture to the FCC business processes and mission goals.
- 2.10 Management of the IT architecture must be proactive, not reactive.
- 2.11 Define HW/SW and procedures for the FCC IT architecture (how does the FCC define components?) and the relationships among the components.
- 2.12 Publicize ITC efforts concerning IT architecture (publicize the actual architecture).
- 2.13 Move away from the idea of “non-standard” components. (standardized system). If a component is “mission-critical,” then support it in the architecture.
- 2.14 Develop mechanism to ensure remaining “non-standard” components will not harm the overall IT architecture.
- 2.15 Aid the Bureaus and Offices in developing alternative (standardized) IT solutions to their proposed mission-critical objectives.
- 2.16 Conduct a project to identify opportunities for integrating separate FCC databases and systems.

**Objective 3: Provide detailed guidance and proactive controls.**

**Strategies:**

**Goal 3**

- 3.1 Provide more two-way accountability (ITC & Bureaus and Offices, ABC/management, COTR/TPOC) for IT budget and procurements.
- 3.2 Establish and document contingency planning guidelines for System Design and Operations; leverage on Y2K BCCP.
- 3.3 Developing a uniform set of guidance on development, testing and deployment of software systems. Include distinction between mission critical and non-critical systems.
- 3.4 Establish an enterprise-wide portfolio management mechanism to perform IT investment reviews for capital assets (steering committee) tied to the budget process.
- 3.5 More SDLC tools: templates, sample documents, best practices and PIR update continually to incorporate reviews of lessons learned from outside FCC.
- 3.6 Develop capacity planning program that links approved project needs to the capacity analysis to the budget process.
- 3.7 Establish ITC focal point (CIO) to lead development of FCC policy guidance that complements and maps to Federal IRM policies (ITMRA, A-130) inclusive process with Bureaus and Offices. Also communicate impact of the rule.
- 3.8 Develop process of yearly reviews for mission critical system to determine if the project should stay the course, increase level effort, modify approach, terminate, re-engineer or replace system.
- 3.9 Pursue training/orientation for all IT people on IT policies and procedures.
- 3.10 Establish a repository on FCC intranet for Federal and FCC IT policy, procedures, guidelines, and standards on IT. Maintain currency of all information on web site.
- 3.11 Establish guidelines for internal coordination and control of reports to external entities. Minimize burden of reporting by consolidating information call to Bureaus and Offices. Make information available within the FCC central repository.
- 3.12 Develop detailed guidance for checks and balances on operation activities for production systems.
- 3.13 Improve procedure for follow-up on open CRC calls, especially calls referred by CRC to Net Ops, NDG, etc.

- 3.14 Develop guidelines for prioritizing critical operational resource requests such as fault tolerant, reliable backups.

**Objective 4: Continually assess new technologies**

**Strategies:**

- 4.1 Solicit Bureau and Office input for new technology opportunities.
- 4.2 Create a continuous formal process (managed by ITC) to identify and assess new technologies, mapped to FCC goals, and maintain supported HW/SW lists.
- 4.3 Communicate assessments (made in the formal process) to Bureaus and Offices for specific impacts.
- 4.4 Sponsor open meetings/briefings/presentations by technical vendors.
- 4.5 Create a dedicated technical assessment org/p.o.c.
- 4.6 Investigate private and public sources of technical review.
- 4.7 Develop common criteria for assessing new technology, as applied to FCC goals.

**Objective 5: Ensure compliance with accessibility requirements**

**Strategies:**



- 5.1 Establish permanent Review Working Groups with participants from Bureaus and Offices to review the Accessibility Standards as they pertain to IT and then develop FCC IT Accessibility Standards.
- 5.2 Establish a review process to ensure that all IT programs adhere to the accessibility standards.
- 5.3 Create a forum to communicate Section 508 accessibility standards to all FCC staff.

**Objective 6: Enforce IT security**

**Strategies:**

- 6.1 Ensure FCC compliance with OMB Circular A-130 and other Federal directives concerning computer security issues.
- 6.2 Ensure compliance with Computer Security Act.

- 6.3 Interface with other agency Computer Security Officers.

### Most Significant Strategies for Goal 3

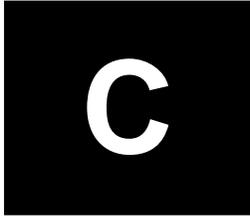
#### Mandatory Items:

1. Establish permanent Review Working Groups with participants from Bureaus and Offices to review the accessibility standards as they pertain to IT and then develop FCC IT accessibility standards. [Mandatory]
2. Establish a review process to ensure that all IT programs adhere to the accessibility standards. [Mandatory]
3. Create a forum to communicate Section 508 accessibility standards to all FCC staff. [Mandatory]
4. Ensure FCC compliance with OMB Circular A-130 and other Federal directives concerning computer security issues. [Mandatory]
5. Ensure compliance with Computer Security Act. [Mandatory]
6. Interface with other agency Computer Security Officers. [Mandatory]

#### Ranked Strategies:

1. Ensure executive awareness of the role of IT at the agency and ensure their ongoing participation and support throughout the IT decision making process. [from Strategies 1.3, 1.6]
2. Establish an enterprise-wide portfolio management mechanism, tied to the budget process, to perform regular IT investment reviews (e.g., steering committee). [from Strategies 3.4, 3.8, 3.14]
3. Implement a process for maintaining the FCC IT architecture that establishes standards and ensures support for business processes and mission goals. [from Strategies 2.4, 2.6, 2.7, 2.9, 2.13, 2.14, 2.15]
4. Manage IT institutional knowledge to ensure continuity of operations (e.g., cross training, employment practices). [from Strategies 1.5, 1.8, 1.10]

5. Develop a new technical assessment program. [from Strategies 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7]
6. Conduct a project to identify opportunities for integrating separate FCC databases and systems. [Strategy 2.16]



## **FCC Environment Information**

This appendix includes the following historical documents:

- FCC Information Technology Life-Cycle Management Program
- FCC PC and Software Inventory (8/31/2000)
- FCC Supported Desktop Software (11/27/2000)
- IT Standards for Purchase Card Acquisitions (November 2000)
- FCC Desktop Computer Purchase Specifications (minimum)
- FCC Notebook Computer Purchase Specifications (minimum)
- Technical Profile List

**Fiscal Year 2000 FCC Information Technology Life-Cycle Management Program**

Item		Quantity	Amount	Life-cycle	Qty/Year	LC Amount
Desktop microcomputers	\$1,300	2600	\$3,380,000	3	867	\$1,127,100
Notebook microcomputers	\$3,000	400	\$1,200,000	3	134	\$402,000
Field Office notebooks w/docking stations	\$3,500	166	\$581,000	3	56	\$196,000
Palm Pilots	\$400	27	\$10,800	3	9	\$3,600
Intel-based file servers	\$30,000	20	\$600,000	4	5	\$150,000
Hewlett Packard personal printers	\$400	500	\$200,000	4	125	\$50,000
Hewlett Packard network printers	\$3,000	350	\$1,050,000	5	70	\$210,000
Hewlett Packard plotters	\$7,000	6	\$42,000	5	2	\$14,000
Hewlett Packard scanners	\$400	81	\$32,400	4	21	\$8,400
ADIC FastStor DLT 7000 jukeboxes	\$8,000	16	\$128,000	4	4	\$32,000
SUN UltraSPARC 60 workstations	\$15,000	40	\$600,000	4	10	\$150,000
SUN Enterprise 4500 servers (Sybase)	\$150,000	6	\$900,000	5	1.2	\$180,000
Cisco 7513 routers	\$75,000	5	\$375,000	4	1.25	\$93,750
Cisco 3660 routers	\$4,000	27	\$108,000	4	7	\$28,000
Cisco Catalyst 5500 network switches	\$44,000	35	\$1,540,000	4	9	\$396,000
Cisco LightStream 1010 ATM switches	\$53,400	4	\$213,600	4	1	\$53,400
Cisco PIX 520 firewall	\$12,000	6	\$72,000	4	1.5	\$18,000
Cisco Access Server 5300	\$44,000	2	\$88,000	4	0.5	\$22,000
APC Smart-UPS rack mount 1400VA	\$700	24	\$16,800	4	6	\$4,200
APC Smart-UPS rack mount 5000VA	\$2,500	4	\$10,000	4	1	\$2,500
Ricoh 3800L facsimile machines	\$1,500	154	\$231,000	5	31	\$46,500
Cell phones with Accessories	\$300	90	\$27,000	3	30	\$9,000
4mm 125m tape cartridges	\$16	600	\$9,600	3	200	\$3,200
8mm 160m tape cartridges	\$11	300	\$3,300	3	100	\$1,100
DLT IV tape cartridges	\$70	1040	\$72,800	3	347	\$24,290
CD-R media (TDK packs of 100)	\$50	6	\$300	1	6	\$300
Microsoft Windows 2000 (workstation)	\$200	2500	\$500,000	2	1250	\$250,000
Microsoft Office Automation Software	\$200	2500	\$500,000	2	1250	\$250,000
Totals			\$12,491,600			\$3,725,340

## Federal Communications Commission PC and Software Inventory

### Summary of PC Desktop Hardware at FCC Portals

Pentium 50	9
Pentium 66	17
Pentium 90	25
Pentium 100	22
Pentium 120	25
Pentium 133	228
Pentium 150	1
Pentium 166	618
Pentium 200	530
Pentium 266	772
Pentium 300	24
Pentium 333	14
Pentium 350	1
Pentium 450	208
Pentium 550	25

### Summary of FCC Standard PC Software

Microsoft Word 97  
Microsoft Excel 97  
Microsoft Access 97  
Microsoft Power Point 97  
Internet Explorer v5.5  
GroupWise v5.5  
Netscape Communicator 4.7  
Adobe Acrobat v4.0  
WestLaw v7.2  
RealPlayer v7  
Compare Rite v7.0 (Lexis Nexis 97)

### Summary of FCC File Server Software

GroupWise v5.5  
ManageWise v2.6  
ArcServeIT v6.6  
Backup Agent for Open Files 6.06  
Softrack v5.00c  
Command Anti Virus v4.594

### FCC Supported Desktop Software (11/27/2000)

*Supported Desktop Software, Training Provided*

- Microsoft Windows 98 Second Edition

- Novell GroupWise 5.5
- Word 97
  - CompareRite 7.0
  - Forms and Standard Docs
- Excel 97
- PowerPoint 97
- Access 97
- Netscape 4.75
  - Netscape Manager
- Internet Explorer 5.5
- Adobe Acrobat Reader v4
- RealPlayer 7 Intranet Edition
- ScanDisk
- Defragmenter
- WinZip
- Disk Cleanup
- Command Software Anti Virus 4.59.4

*Supported Desktop Software. No formal classroom training provided*

- Dragon Dictate Naturally Speaking
- JAWS
- On Demand CBT
- Westmate 7.3 (contact FCC Library for availability)
- Attachmate Extra! Version 6.4
- Kermit-95
- Microsoft Windows 95
- Windows NT (as determined by ITC)
- NetTerm

*Special Purpose Software Classroom training but not extensive support of consulting*

- Microsoft Project 98
- VISIO 2000 Professional Edition

*Desktop Software not supported*

- Ping, FTP, Telnet, Trace Route
- Windows NetMeeting
- Acrobat Exchange, Acrobat Capture
- Visual Speller
- Vue Pro
- WinFax Pro
- Lotus
- TSP/GiveWin 4.5
- SPSS
- Microsoft Front Page Express
- Palm Desktop
- Netscape Composer
- Microsoft Publisher
- GroupWise Conversation Place

## IT Standards for Purchase Card Acquisitions – November 2000

- \*Computer Monitors – (17” – 21” 1024x768 @ 75 Hz refresh rate, .26mm dot pitch)
- Hard Disk Drives – (Quantum Fireball hard disk)
- \*Inkjet printers – (Hewlett-Packard 970Cxi color inkjet printer)
- \*Laser printer personal – (Hewlett-Packard LaserJet 1100 printer)
- \*Laser printer workgroup – (Hewlett-Packard LaserJet 4050N printer)
- \*Laser printer office – (Hewlett-Packard LaserJet 8100N printer)
- \*Color laser printer – (Hewlett-Packard Color LaserJet 4500N printer)
- \*Color scanner – (Hewlett-Packard ScanJet 5200c scanner)
- \*CD Writer – (Hewlett-Packard CD-Writer Plus 9100i)
- Personal Scanner – (Vioneer Strobe Pro)
- PC backup drive – (Iomega Zip 250 Mb USB Drive)
- \*\*Fax machine – (Ricoh 3800L, 4800L)
- \*\*Digital cell phone – (Motorola StarTAC 7860W from Verizon (recommended phone); Nokia from both AT&T and Sprint)
- \*\*Cell phone – (Motorola StarTAC 6500 from Verizon (recommended phone))\*\*ISDN Headset – (Plantronic Model #H81N, Part #26091-01 from Anixter). The headset also requires the purchase of the following two peripheral devices:
  - Adaptor & Volume Control – (Plantronics Model #P10, Part #29362-10)
  - Lucent System 75/85 adapter – (Model #500A1-003, Part #107 152 100)
- \*\*Conference Phone – (SoundStation EX Console, part #2200-01423-001 from Review Video Services; SoundStation EX with extended microphones, part #2200-00696-001 from Review Video Services; Sound Station EX with microphones & wireless system, part #2200-00697-001 from Review Video Services)
- Pager – (Skytel). Call your CSR to acquire – these are leased devices.
- Office Automation software – (Microsoft Office 97 Professional)
- Drawing and diagramming software – (Visio 2000 Professional)
- PDF creation software – (Adobe Acrobat 4.0)
- PC Utilities software – (Norton SystemWorks 2000 3.0)
- Fax software – (WinFax Pro 9.0)
- Project management software – (Microsoft Project 98)
- Optical Character Recognition (OCR) software – (OmniPage Pro 9.0)

\* Denotes items that must be purchased from an authorized BPA vendor.

\*\* Denotes items that must be purchased from the designated telecom vendor.

## **Current FCC Desktop Computer Purchase Specifications (minimum) September 2000**

Intel Pentium III (FCPGA) or AMD Athlon (Socket A) 800 MHz CPU  
Front Side Bus (FSB): 133 MHz for Intel and 200 MHz for AMD solutions  
DIMM sockets supporting up to 512Mb of PC133 SDRAM  
128Mb PC133 SDRAM (must be system manufacturer approved)  
2 PCI and 1 AGP Pro/AGP 4X expansion slots open and available  
15Gb EIDE hard disk drive with 8.5 ms average seek time and 7200 rpm rotational speed  
48X EIDE/ATAPI internal CD-ROM drive  
3.5" 1.44Mb floppy disk drive  
17" (16.0" viewable) monitor with .26 mm dot pitch and capable of displaying resolution of:  
1024x768 at 75 Hz vertical refresh rate  
AGP 2X video; 16Mb of video memory available, 64-bit 2D, 3D and software DVD encoder  
3Com 3C905CTX 10/100 PCI network interface card (not built into motherboard)  
Microsoft IntelliMouse with PS/2 interface (or equivalent)  
Windows 98 compatible keyboard  
SoundBlaster PCI 64 sound card (or equivalent)  
External speakers  
2 USB ports  
1 serial and 1 parallel port  
1 PS/2 keyboard and 1 PS/2 mouse ports  
Windows 98 Second Edition installed, to include license certificate  
Mid-tower chassis (minimum of two 3.5" and one 5.25" open slots available after installation)  
3-year warranty (1 year on-site including parts and labor with next business day on-site response,  
2 year mail-in, freight charges to and from depot repair paid by vendor)  
All cards, except for AGP video, must have PCI bus interface.  
Y2K and EnergyStar compliant  
The system-processing unit shall not have a relative acoustic power level greater than 45 dB(A).  
All machines in order must have identical system board, and video, network, and sound cards.  
All machines in order must have the same firmware versions including those of system board,  
and video, network, and sound cards.  
Complete sets of media and documentation provided for software drivers.  
  
Each system must be labeled to identify its configuration.  
System (including chassis, power supply, and internal components) must be UL listed.  
System must carry FCC Declaration of Conformity (DoC).  
(FCC standard FOCUS client software image configuration loaded at factory from FCC provided CD-  
ROM disc, two machines will be provided to FCC to build the FOCUS client three weeks prior to the  
remainder of order being completed. FCC will provide manufacturer with software license ownership  
documentation.)

## **Current FCC Notebook Computer Purchase Specifications (minimum)**

Intel Pentium III 800 MHz CPU with SpeedStep technology and 256Kb of L2 cache  
2 SODIMM sockets capable of accommodating up to 512Mb of PC100 SDRAM  
128Mb of PC100 SDRAM on one SODIMM  
12Gb hard disk drive  
24x ATAPI internal CD-ROM drive  
3.5" 1.44Mb internal floppy disk drive  
AGP 2X video graphics interface with 16Mb SGRAM  
14" active matrix TFT XGA LCD screen with a resolution of 1024x768  
3Com 3CCFEM556B 10/100 LAN and 56K modem combo PC card  
Built-in SoundBlaster compatible audio  
Built-in stereo speakers and microphone  
1 parallel, 1 serial, 1 external VGA, 2 USB, 1 infrared FIR, and 1 PS/2 keyboard or mouse port  
Microphone-in, line-in, and line-out jacks  
Docking station port or port replication port  
87-key keyboard with 101/102bkey emulation and 1 Windows key  
Trackpad with 2 buttons  
Nylon carrying case  
AC adapter  
3 year of mail-in/mail-back depot warranty including parts and labor  
Windows 98 Second Edition installed includes license certificate  
FAT32 installed on disk partition  
(Notebook must be Y2K compliant)  
(Notebook must be UL listed)  
(Notebook must carry FCC Declaration of Conformity (DoC))

**Technical Profiles**

SYSTEM	B/O	POC
Consolidated Database System (CDBS)	MMB	Ron Novak
Call Sign Reservation System (Call Sign)	MMB	Grace Fowler
Children’s Television System (KidVid)	MMB	Regina Barrett
Universal Licensing System (ULS)	WTB	Judy Dunlap
Auctions Automated System (AAS)	WTB	John Giuli
Auctions Expenditure Tracking System (AETS)	WTB	Christopher McManus
International Bureau Filing System (IBFS)	IB	Jacki Ponti
Canadian Cochannel Serial Coordination System (COSER)	IB	Jacki Ponti
Cable Operations/Antenna Relay (COALS)	CSB	John Mount
Cable Tracking System (CTS)	CSB	Jackie Coles
Price Survey System	CSB	John Mount
Equipment Authorization System (EAS)	OET	Sandy Haase
Experimental Licensing System (ELS)	OET	Sandy Haase
Electronic Comments Filing System (ECFS)	CIB	Steve Gorey
Informal Complaints (OSCAR)	CIB	Steve Gorey
Integrated Voice Response (IVR)	CIB	Steve Gorey
Expert Adviser	CIB	Steve Gorey
Automated Reporting Management Information System (ARMIS)	CCB	Fatina Franklin
Electronic Tariff Filing System (ETFS)	CCB	Judy Nitsche
Chairman’s Lifecycle Agenda Tracking System (CLAS)	OMD	Magalie Salas
Revenue Accounting & Management Information System (RAMIS)	OMD	Mary Linda Norman
Commission Registration System (CORES)	OMD	Mary Linda Norman
Collections System	OMD	Bill Lewis
Electronic Document Management System (EDOCS)	OMD	Magalie Salas
Cost Reporting System (CRS)	OMD	Bill Lewis
Management Tracking System (MTS)	OMD	Magalie Salas Eddie Richardson (WTB)
General Menu Reports (GENMEN)	OMD	Mike Kemper
Remittance Over Secure Internet E-Commerce (ROSIE)	OMD	Bill Lewis
Procurement Desktop (IDEAS-PD)	OMD	Sonna Stampone
Case Tracking System	OGC	Lewis Young
Automated Congressional Management System (ACMS)	OLIA	Connie Chapman

# D

## Target Architecture Candidate Technologies

In developing the target ITA, the FCC identified technologies that are candidates for implementation at the Commission. After identification, the technologies were mapped to the IT strategies to both validate them against the Commission’s IT strategic goals and objectives and to link technologies to the most significant strategies. This exercise facilitated the development of the target ITA.

Exhibit D-1 presents the list of technologies that are candidates for implementation at the Commission. The technologies are not ranked in any particular order. The cost for implementing each technology falls into one of the following investment categories:

- Small: Less than \$50,000
- Medium: Between \$50,000 and \$150,000
- Large: Greater than \$150,000

No.	Technologies	Votes	Investment Size
1	Terminal Servers	2	Medium
2	Storage Area Networks	8	Large
3	High-speed, high-capacity tape jukeboxes	8	Medium
4	Network Attached Storage	10	Large
5	Distributed Host-based Firewalls	4	Large
6	Faster, higher bandwidth network backbone	10	Large
7	Voice/IP	3	Large
8	Broadcast-Video	1	Large
9	Collaborative Services *	5	Medium
10	Capacity Management	10	Medium
11	Network Management tools	13	Large
12	Client independent applications tools	1	Large
13	Enterprise Management tools	9	Large
14	Information Engineering tools *	3	Medium
15	Personal Data Assistant (PDA)	1	Medium
16	Wireless/Mobile (International)	1	Large
17	Workstation Operating System upgrade	2	Large
18	Environmental issues (facilities power & space)	7	Medium
19	Portals technology	8	Large
20	High-speed telecommuter access *	5	Large
21	Standard software development tools	10	Large

22	Hot-Sites for system redundancy	0	Large
23	Centralized backup systems	7	Medium
24	PKI and other security technologies	M**	Large
25	Improved cell phone and pager services *	0	Medium
26	Document Management system *	13	Large
27	Load balance Internet infrastructure	2	Medium
28	Imaging technology	3	Large
29	Hardware-based Firewalls	0	Medium
30	Data Warehouse / Repository / Dictionary	12	Large
31	Work Flow tools *	5	Medium
32	Pure IP network environment	4	Small
33	Test-bed environment / staging area	8	Large
34	Web Publishing environment	6	Medium
35	Improve support issues (ITC staff skill sets)	1	Large
36	ITC technical training and education	9	Medium
37	Industry standard electronic mail system *	5	Large
38	Migrate to existing standards on other applications	0	Medium
39	Centrally managed client desktop	4	Large
40	Project Management tools *	5	Medium
41	Place all systems under Directory Services	4	Small
42	Support multiple standard clients	2	Large
43	Specialized (high-end) printing services	2	Large
44	Support other Operating Systems	4	Large
45	PC/Fax services *	2	Small
46	Video conference from desktop *	0	Large
47	Improve network speeds to desktop computers	4	Medium
48	Web-based Forms software package	9	Medium
49	CRM tools	2	Large
50	ERP software	3	Large
51	Long-term archival solution	4	Medium
52	Performance Measure tools	6	Medium
53	Assistive Technologies	M**	Large
54	Reporting tools *	5	Medium
55	IVR Technologies	3	Large
56	Mapping tools (GIS)	0	Medium

\* Denotes technologies that are grouped to support process-related strategies

\*\* Denotes technologies that were not included in the voting because they are mandatory

**Exhibit D-1. Target ITA Candidate Technologies**

The results of the technologies/strategies mapping exercise are presented in Exhibits D-2, D-3, and D-4 for Goals 1, 2, and 3 respectively. The “Rank” column indicates the rankings for strategies deemed “most significant” by their respective working groups. The “Resource Impact” column identifies each strategy as “major” or “minor”. Major means that pursuing the strategy will put considerable strain on the current resources at FCC—including personnel, environmental resources, servers, bandwidth, and telecommunications equipment. The column labeled “P/T” (Process/Technology) denotes whether the strategy can be accomplished by reengineering or developing a process (P) or if it requires enhancements to the ITA (T). All strategies labeled “P” automatically include a base group of technologies that are process related. The process group includes the following technologies: 9,14,20,25,26,31,37,40,45,46, and 54.

Strategies		Rank	Resource Impact	P/T	Applicable Technologies
1.1	Review process of Administration Resource Impact statement creation for realism/impact.	7	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.2	Create cross organization advisory team to respond to unplanned priorities.	7	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.3	Review current tools and create/maintain recommended development tools list (use outside expertise).		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.4	Create reserve hardware capacity for development and production purposes.	8	major	T	2,3,4,5,6,10,11,13,18,22,23,33,36
1.5	Identify critical systems that we now have and ensure that core systems can be responsive to changes that must be made quickly (i.e. can be quickly changed, non-proprietary system/software).		minor	P	9,14,20,25,26,31,37,40,45,46,54,13,11,21,33,34
1.6	Create and maintain in-house implementation and maintenance expertise (FTE).		major	T	7,35,37
1.7	Create budget contingency fund for unplanned changes (no-year funds, allocated by advisory team).	8	minor	T	50
1.8	Review and streamline process to hire technical support (contractor and in-house).		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.9	Review Process of FCC’s response to external legislative/policy directives.	7	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.10	Enforce system documentation (i.e. via implementing the SDLC).		minor	P	9,14,20,25,26,31,37,40,45,46,54,13,24,30
1.11	Agency-wide application integration that highlights code sharing, data standardization, and data warehousing.	4	major	T	13,21,30,34
1.12	Create cross-organization technology review team for architecture duration, and develop experience sharing.		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.13	Review budget allocation and procurement process for speed (i.e., can the process be accelerated?).	8	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.14	Create an outreach mechanism for early identification of requirements.		minor	T	49

2.1	Define measures of success for reporting and performance assessment (e.g., what applications and types of filing does this apply to?).		minor	T	11,52
2.2	Determine strategy on FCC Rulemakings (B/O specific or FCC wide) to make electronic filing mandatory.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.3	Continual assessment of internal processes that will compliment how we move to 100 percent electronic filing.		minor	P	9,14,20,25,26,31,37,40,45,46,54,52
2.4	Continual assessment of IT infrastructure that will compliment how we move to 100 percent electronic filing.		minor	T	10,11,13,24
2.5	Develop capacity planning estimates based on best (peak load) case scenarios.		minor	T	10,11,27,33,52
2.6	Staff planning that is proactive and based on movement toward 100 percent electronic filing.		minor	T	33,50
2.7	Identify technologies and strategies to reduce cycle time for development and deployment		minor	T	12,21,33,34,39,40,42
2.8	Do more rigorous schedule and risk estimates for specific electronic filing initiatives.		minor	T	11,24,33,40,52
2.9	Implement critical electronic filing system enhancements that are customer driven (e.g. get customer feedback).	3	minor	P	9,14,20,25,26,31,37,40,45,46,54,8,19,34,49
2.10	Implement formal capacity planning, contingency to make electronic filing system 100 percent reliable and available.	1	major	T	2,3,4,5,6,10,11,12,15,18,20,22,23,27,29,32,42,45
2.11	Foster Enterprise perspective (agency-wide view) for common functions like mergers, fee payment.	4	minor	P	9,14,20,25,26,31,37,40,45,46,54,21,30,50
2.12	Determine why public and industry can't do electronic filing 100 percent.		minor	P	9,14,20,25,26,31,37,40,45,46,54,8,11,15,18,25,48,49
2.13	Assess FCC movement toward consolidating FCC systems to reduce data entry burden on applicants and provide a "common" interface.	5	minor	P	9,14,20,25,26,31,37,40,45,46,54,14,30,42,48
2.14	Provide a regular forum for sharing problems and customer feedback across B/O electronic filing systems.	6	minor	P	9,14,20,25,26,31,37,40,45,46,54
2.15	Implement appropriate levels of security and privacy for electronic filing systems to address customer concerns (i.e. digital signature). [Mandatory]		major	T	21,24
2.16	Pursue system enhancements for accessibility. [Mandatory]		major	T	12,42,48,49,53
2.17	Prioritize FCC electronic filing needs across the agency to determine which are 1) biggest bang-for-the-buck, 2) easiest to implement, 3) highest visibility.		minor	P	9,14,20,25,26,31,37,40,45,46,54,19,21,52
2.18	Activate a change management program to orient and train FCC staff on electronic filing system – overcome resistance.		minor	P	9,14,20,25,26,31,37,40,45,46,54,19
3.1	Processing should be real-time.		major	T	7,8,10,15,16,18,20,21,28,30,45
3.2	Establish speed of service standards.		minor	P	9,14,20,25,26,31,37,40,45,46,54

3.3	Communicate service results.		minor	T	34,43,50,52,54
3.4	Assess speed-of-service, time and quality.		minor	P	9,14,20,25,26,31,37,40,45,46,54,11,52
3.5	Enhance assistance for customer-user interface (chat).	2	major	P	9,14,20,25,26,31,37,40,45,46,54,15,37,49
3.6	Ensure redundancy.	1	major	T	2,3,4,5,6,10,11,12,13,14,17,18,19,20,21,22,23,24,26,27,30,31,32,33,35,36,39,40,41,42,43,44,45,48
3.7	Implement phone (IVR) for customer support – all input channels. (web, call center, application experts).	2	major	P	9,14,20,25,26,31,37,40,45,46,54,7,8,32,45,46,49,55
3.8	Enhance technical support; e.g. software to manage the help desk.	1	major	P	9,14,20,25,26,31,37,40,45,46,54,25,35
3.9	Study opportunity for a virtual reference center.		minor	T	1,19,21,26,34
3.10	Develop archiving solution.		major	T	3,23,30,45,51
3.11	Improve access to graphical reference room.		minor	T	6,28,43,51,56
3.12	Enhance enterprise-wide searchability.		major	T	13,19,21,30,33
3.13	Ensure accessibility. [Mandatory]		major	T	12,19,42,48,49,53
3.14	Find out what the customers need – (Palm Pilot support, PDA, wireless).		minor	P	9,14,20,25,26,31,37,40,45,46,54,15,16,48,49
3.15	Preserve traditional as well as automated support (human).		minor	P	9,14,20,25,26,31,37,40,45,46,54,35,36,45,50
3.16	Adopt FCC wide standardization of terms, tools, and navigation for Internet presence.	4	major	T	12,14,19,21,30,37
3.17	Create common interfaces for application at the web level.	4	major	T	28,48
3.18	Improve monitoring and intrusion detection capability to support 24x7 access.		major	T	11,13,20,24,25,52
3.19	Remove impediment to non-English speaking customers.		major	T	12,21,19,55
3.20	Assess option for FCC staff to work 2nd, 3rd shifts, 24x7.	1	minor	P	9,14,20,25,26,31,37,40,45,46,54

Exhibit D-2. Goal 1 Strategies and Applicable Technologies

Strategies		Rank	Resource Impact	P/T	Applicable Technologies
1.1	Develop and implement an enterprise-wide dictionary for database applications.	4	major	T	30
1.2	Establish a library of sharable code.		major	T	14,21,23,30,36,38,51
1.3	Establish a review and approval process for additions or changes to established architecture.		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.4	Document all standards and common interfaces where they can be found easily. Enforce them for staff and contractors.		major	P	9,14,20,25,26,31,37,40,45,46,54,12,21,30,34
1.5	Assess user needs up front; articulate day-to-day needs beyond routine tasks (e.g., maps, and searches).	6	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.6	Enhance remote access for field users and other types of remote users; pursue best practices and state-of-the-art solutions (e.g., web, thin client).		major	T	1,5,7,8,11,15,16,19,20,24,25,26,27,29,30,32,37,39,45,46,48,54
1.7	Establish appropriate life cycle management program considering financial and technological impacts.		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.8	Measure total cost of ownership at desktop system, services.		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.9	Map FCC infrastructure to be able to plan for changes.		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.10	Streamline administrative processes and systems (employees).	8	minor	P	9,14,20,25,26,31,37,40,45,46,54
2.1	Employ e-mail to inform FCC staff of hardware/software changes.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.2	Reestablish B/O monthly information exchange meetings (DALO).	7	minor	P	9,14,20,25,26,31,37,40,45,46,54
2.3	Schedule regular sessions on use of FCC databases and systems.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.4	Create knowledge repositories available via electronic means (such as the COTR Corner).		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.5	Host informal information exchange meetings (lunch brown-bags).		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.6	Create an electronic forum/bulletin board on the FCC intranet for topic-specific information exchange.	11	minor	P	9,14,20,25,26,31,37,40,45,46,54
2.7	Schedule/host electronic chat sessions (FCC intranet; video, voice, real time, text).		major	P	9,14,20,25,26,31,37,40,45,46,54,8,15
2.8	Create internal FCC "list server" for parties to receive subject-related information electronically.		major	P	9,14,20,25,26,31,37,40,45,46,54
2.9	Produce a regularly scheduled newsletter (e-gram like) on systems, technical information.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.10	Follow the SDLC for input to major systems by B/O.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.11	Post system quarterly reports available to all FCC/CSRs to highlight interface opportunities (system development IT reviews).		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.12	Expand use of video streaming for desktop delivery of information.		major	T	8,21,32

2.13	Host CIO meeting (quarterly) on strategic and tactical items.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.14	Produce an annual FCC CIO report of systems, infrastructure, progress on strategic plan, direction for next year (snapshot for reference).		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.15	Hold IT technical subject sessions featuring subject matter experts (internal, public, invited guests).		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.16	Identify links between System Owners/COTRs/ Managers to foster information sharing.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.1	Create, define, and communicate agency-wide IT service level agreements in accordance with budgetary constraints and union rules that span the FCC (intra-bureau, inter-bureau, ITC/agency), e.g., outage notifications and restore service, Help Desk support, software distribution and impact).	2	minor	P	9,14,20,25,26,31,37,40,45,46,54
3.2	Keep customers informed when contractual matters prevent meeting service levels.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.3	Provide written feedback to B/O customers on meeting service standards.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.4	Tie performance of responsible party to service level agreements (e.g., contract incentives, performance clauses, employee days off).		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.5	Where appropriate, align IT service level agreements with externally published standards.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.6	Compile and publish key ITC point-of-contact information (e.g., core hours, after-hours contact procedures).		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.7	Using reinstated DALO meetings to communicate customer service standards, and promises vs. results.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.8	Establish a periodic review of service level standards to maintain currency.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.9	Communicate status and expectations to individual customers.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54
3.10	Perform quality assurance surveys to assess success and quality of service.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.11	Employ agency-wide solution to monitor, measure, and analyze service levels.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.12	Assess and communicate infrastructure strengths, constraints, trade-offs, and possible alternatives where needed (e.g., firewall). [related to Objective 2]		minor	P	9,14,20,25,26,31,37,40,45,46,54
4.1	Implement the use of Geographic Information Systems (GIS) within the FCC.		major	T	6,47,56
4.2	Explore enterprise-wide (all data repositories) backup and archival process solutions.	9	major	T	3,22,23,51
4.3	Explore global shared drive concept.		major	T	4,26,30,38
4.4	Implement new techniques and methods to disseminate the information pertaining to the existing FCC database systems (demos, interactive, web-based, PowerPoint).	10	minor	P	9,14,20,25,26,31,37,40,45,46,54

4.5	Explore new solutions that can provide a common interface and look and feel to the data sets.		major	T	21
4.6	Provide data links to the different FCC databases.		major	T	30
4.7	Explore web-based data delivery solutions (wireless access, accessibility issues).		major	T	15,16,48,53,54
4.8	Explore GroupWare solutions (group collaboration software).		major	T	9,26
4.9	Explore Server-based as opposed to client-based solutions.		major	T	1,19,34,48
4.10	Work to ensure there is a Bureau-level coordination of data assets (i.e., database data) (a liaison that knows where the B/O data is stored, a person inside the B/O that is knowledgeable concerning the B/O IT functions and "stuff").	1	minor	P	9,14,20,25,26,31,37,40,45,46,54
4.11	Explore document management solutions (including version control).		major	T	26
4.12	Explore implementing an FCC-wide data dictionary.		major	T	30
4.13	Share data elements across different systems.		major	T	30
4.14	Ensure data systems are well documented.		major	P	9,14,20,25,26,31,37,40,45,46,54
4.15	Ensure that data within the Administrative systems are linked "where appropriate" and accessible to authorized FCC personnel.		major	P	9,14,20,25,26,31,37,40,45,46,54,30
4.16	Explore the use of state-of-the-art software tools to access FCC data (internal and external).	5	major	T	5,9,12,14,19,21,24,26,28,30,31,34,37,40,41,44,48,49,50,52,53
4.17	Explore the use of web-based cookie technology to query internal FCC data.		major	T	34
4.18	Study options to reduce the number of software products that are used (balance between development flexibility and creating legacy systems).		major	T	21,38
4.19	Explore the expanded use of data warehousing.		major	T	30
4.20	Improve timeliness and accessibility of Administrative systems.		major	P	9,14,20,25,26,31,37,40,45,46,54
4.21	Explore the use of document management tools that will provide ownership, creation, and modification date stamps, security permissions.		major	T	26
4.22	Expand the use of common interface models for putting together applications so they will inter-operate (industry standard common interface models).		major	T	21,30
4.23	Expand the use of optical jukebox systems for storage and retrieval services.		major	T	3
4.24	Communicate the existing records management policy (storage, archival, retention period).		minor	P	9,14,20,25,26,31,37,40,45,46,54,51

Exhibit D-3. Goal 2 Strategies and Applicable Technologies

Strategies		Rank	Resource Impact	P/T	Applicable Technologies
1.1	Develop and distribute a list of IT points-of-contact and backup with roles and responsibilities (on intranet by function for ITC and B/O) in key areas.		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.2	Determine required (project management) expertise for IT skill set. Assess current IT skills to identify gaps. (must be performed by FTE versus contractor.)		minor	P	9,14,20,25,26,31,37,40,45,46,54,36
1.3	Ensure executive awareness, support, and participation in developing and using IT in the agency.	1	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.4	Clearly delineate FTE function, Role and Responsibility versus that of the contractor.		minor	P	9,14,20,25,26,31,37,40,45,46,54
1.5	Manage IT knowledge, capture and share, and maintain access to lost knowledge.	4	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.6	Develop and present IT proposal to executives (alternatives, cost to implement versus cost not to implement in priority order).	1	minor	P	9,14,20,25,26,31,37,40,45,46,54
1.7	Provide incentives (educational opportunities) to develop and maintain IT skills (ITC and B/O).		minor	P	9,14,20,25,26,31,37,40,45,46,54,36
1.8	Ensure cross training for continuity of operations.	4	minor	P	9,14,20,25,26,31,37,40,45,46,54,36
1.9	Reassess avenues for acquiring IT expertise other than contracting (interns, external hires, industry partnerships, inter-agency details).		minor	P	9,14,20,25,26,31,37,40,45,46,54,36
1.10	Ensure access to new IT expertise prior to losing existing expertise.	4	minor	P	9,14,20,25,26,31,37,40,45,46,54,36
2.1	Periodic review by outside organization to evaluate the FCC IT architecture (ensure independence and publicize results.)		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.2	Ensure that FCC IT architecture adheres to OMB guidance.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.3	Centralize the configuration control plan of the FCC IT architecture to ensure that it is all encompassing (applies to all B/Os).		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.4	Provide means for B/Os to get new IT products and technologies added to the IT architecture.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54
2.5	Ensure the decision-makers are aware of the costs to the strategies and risk associated with implementing the strategies.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.6	Develop a prioritization mechanism to implement new technology into the FCC IT architecture.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54
2.7	Create a detailed IT architecture mapped to business processes and funding sources.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54
2.8	Place highest priority on incorporating and maintaining high technology (reliable) backup systems.		major	T	3,51
2.9	Map the FCC IT architecture to the FCC business processes and mission goals.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54

2.10	Management of the IT architecture must be proactive, not reactive.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.11	Define HW/SW and procedures for the FCC IT architecture (how does the FCC define components?) and the relationships among the components.		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.12	Publicize ITC efforts concerning IT architecture (publicize the actual architecture).		minor	P	9,14,20,25,26,31,37,40,45,46,54
2.13	Move away from the idea of “non-standard” components. (standardized system). If a component is “mission-critical,” then support it in the architecture.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54,21,38
2.14	Develop mechanism to ensure remaining “non-standard” components will not harm the overall IT architecture.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54,21,38
2.15	Aid the B/O in developing alternative (standardized) IT solutions to B/O proposed mission-critical objectives.	3	minor	P	9,14,20,25,26,31,37,40,45,46,54
3.1	Provide more two-way accountability (ITC & B/O, ABC/management, COTR/TPOC) for IT budget and procurements.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.2	Establish and document contingency planning guidelines for System Design and Operations; leverage on Y2K BCCP.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.3	Developing a uniform set of guidance on development, testing and deployment of software systems. Include distinction between mission critical and non-critical systems.		major	P	9,14,20,25,26,31,37,40,45,46,54,33,34
3.4	Establish an enterprise-wide portfolio management mechanism to perform IT investment reviews for capital assets. (steering committee) tied to the budget process.	2	minor	P	9,14,20,25,26,31,37,40,45,46,54
3.5	More SDLC tools: templates, sample documents, best practices and PIR continually update continually to incorporate reviews of lessons learned from outside FCC.		major	P	9,14,20,25,26,31,37,40,45,46,54
3.6	Develop capacity planning program that links approved project needs to the capacity analysis to the budget process.		minor	P	9,14,20,25,26,31,37,40,45,46,54,10
3.7	Establish ITC focal point (CIO) to lead development of FCC policy guidance that complements and maps to Federal IRM policies (ITMRA, A-130) inclusive process with B/Os. Also communicate impact of the rule.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.8	Develop process of yearly reviews for mission critical system to determine if the project should stay the course, increase level effort, modify approach, terminate, re-engineer or replace system.	2	minor	P	9,14,20,25,26,31,37,40,45,46,54
3.9	Pursue training/orientation for all IT people on IT policies and procedures.		minor	P	9,14,20,25,26,31,37,40,45,46,54,36
3.10	Establish a repository on FCC intranet for Federal and FCC IT policy, procedures, guidelines, and standards on IT. Maintain currency of all information on web site.		minor	P	9,14,20,25,26,31,37,40,45,46,54,30

3.11	Establish guidelines for internal coordination and control of reports to external entities. Minimize burden of reporting by consolidating information call to B/Os. Make information available within the FCC central repository.		minor	P	9,14,20,25,26,31,37,40,45,46,54,30
3.12	Develop detailed guidance for check and balances on operation activities for production systems.		major	P	9,14,20,25,26,31,37,40,45,46,54
3.13	Improve procedure for follow-up on open CRC calls, especially calls referred by CRC to Net Ops, NDG, etc.		minor	P	9,14,20,25,26,31,37,40,45,46,54
3.14	Develop guidelines for prioritizing critical operational resource requests such as fault tolerant, reliable backups.	2	minor	P	9,14,20,25,26,31,37,40,45,46,54,3,51
4.1	Solicit B/O input for new technology opportunities.	5	minor	P	9,14,20,25,26,31,37,40,45,46,54
4.2	Create a continuous formal process (managed by ITC) to identify and access new technologies, mapped to FCC goals, and maintain supported HW/SW lists.	5	major	P	9,14,20,25,26,31,37,40,45,46,54
4.3	Communicate assessments (made in the formal process) to B/O for specific impacts.	5	minor	P	9,14,20,25,26,31,37,40,45,46,54
4.4	Sponsor open meetings/briefings/presentations by technical vendors.	5	minor	P	9,14,20,25,26,31,37,40,45,46,54
4.5	Create a dedicated technical assessment org/p.o.c.	5	minor	P	9,14,20,25,26,31,37,40,45,46,54
4.6	Investigate private and public sources of technical review.	5	minor	P	9,14,20,25,26,31,37,40,45,46,54
4.7	Develop common criteria for assessing new technology, as applied to FCC goals.	5	minor	P	9,14,20,25,26,31,37,40,45,46,54
5.1	Establish permanent Review Working Groups with participants from B/Os to review the Accessibility Standards as they pertain to IT and then develop FCC IT Accessibility Standards. [Mandatory]		minor	P	9,14,20,25,26,31,37,40,45,46,54,53
5.2	Establish a review process to ensure that all IT programs adhere to the accessibility standards. [Mandatory]		minor	P	9,14,20,25,26,31,37,40,45,46,54,53
5.3	Create a forum to communicate Section 508 accessibility standards to all FCC staff. [Mandatory]		minor	P	9,14,20,25,26,31,37,40,45,46,54,53
6.1	Ensure FCC compliance with OMB Circular A-130 and other Federal directives concerning computer security issues. [Mandatory]		major	P	9,14,20,25,26,31,37,40,45,46,54,24
6.2	Ensure compliance with Computer Security Act. [Mandatory]		major	P	9,14,20,25,26,31,37,40,45,46,54,24
6.3	Interface with other agency Computer Security Officers. [Mandatory]		minor	P	9,14,20,25,26,31,37,40,45,46,54,24

Exhibit D-4. Goal 3 Strategies and Applicable Technologies

Exhibit D-5 summarizes the results of the technologies and strategies mapping exercise. Each member of the target architecture working group was given the opportunity to vote for their 15 most important technologies. The “Votes” column contains the results.

Technologies	Votes	Number of Target Strategies Supported	Number of Process Strategies Supported
PKI and other security technologies	<b>Mand</b>	2	0
Assistive Technologies	<b>Mand</b>	1	0
Data Warehouse / Repository / Dictionary	<b>12</b>	5	2
Standard software development tools	<b>10</b>	4	3
Document Management system	<b>13</b>	2	42
Network Management tools	<b>13</b>	3	0
Network Attached Storage	<b>10</b>	3	0
Faster, higher bandwidth network backbone	<b>10</b>	3	0
Capacity Management	<b>10</b>	3	0
ITC technical training and education	<b>9</b>	2	2
Web-based Forms software package	<b>9</b>	3	1
High-speed, high-capacity tape jukeboxes	<b>8</b>	4	1
Enterprise Management tools	<b>9</b>	3	0
Portals technology	<b>8</b>	3	1
Storage Area Networks	<b>8</b>	3	0
Centralized backup systems	<b>7</b>	4	0
Test-bed environment / staging area	<b>8</b>	2	0
Environmental issues	<b>7</b>	3	0
Web Publishing environment	<b>6</b>	2	1
High-speed telecommuter access	<b>5</b>	2	42
Work Flow tools	<b>5</b>	2	42
Industry standard electronic mail system	<b>5</b>	2	42
Project Management tools	<b>5</b>	2	42
Distributed Host-based Firewalls	<b>4</b>	4	0
Performance Measure tools	<b>6</b>	1	0
Collaborative Services	<b>5</b>	1	42
Pure IP network environment	<b>4</b>	2	1
Information Engineering tools	<b>3</b>	3	42
Reporting tools	<b>5</b>	0	42
Place all systems under Directory Services	<b>4</b>	2	0
Support other Operating Systems	<b>4</b>	2	0
Long-term archival solution	<b>4</b>	1	1
ERP software	<b>3</b>	2	1
CRM tools	<b>2</b>	1	3
Centrally managed client desktop	<b>4</b>	1	0

Imaging technology	3	2	0
PC/Fax services	2	2	42
Support multiple standard clients	2	2	1
Client independent applications tools	1	4	0
Improve network speeds to desktops	4	0	0
Voice/IP	3	0	1
IVR Technologies	3	0	1
Load balance Internet infrastructure	2	2	0
Hot-Sites for system redundancy	0	4	0
Workstation Operating System upgrade	2	1	0
Specialized (high-end) printing services	2	1	0
Broadcast-Video	1	0	2
Personal Data Assistant (PDA)	1	1	1
Improve support issues (ITC staff skill sets)	1	1	1
Terminal Servers	2	0	0
Migrate to existing standards on other apps	0	0	2
Wireless/Mobile (International)	1	0	0
Improved cell phone and pager services	0	0	42
Video conference from desktop	0	0	42
Hardware-based Firewalls	0	1	0
Mapping tools (GIS)	0	0	0

**Exhibit D-5. Candidate Target Architecture Technologies and their Support for Implementation Strategies**



## Derived Findings

The various strategies were reviewed to determine if there were any re-occurring themes, or common threads between each of the three goals. The following paragraphs detail the primary themes that emerged. Text appearing in **bold type** was identified as a top ranking strategy from its respective goal. It is possible for a strategy to appear in multiple identified themes.

The 170 strategies identified in the working group sessions tended to fall into the following categories:

TOPIC
ACCESSIBILITY
ARCHITECTURE
BUDGET
CAPACITY AND CAPACITY PLANNING
CUSTOMER NEEDS
DOCUMENT MANAGEMENT
ELECTRONIC FILING
POINT OF CONTACT
PROCESS
REMOTE ACCESS
SECURITY
SERVICE
SHARING
TOOLS
OTHERS TYPES OF BUSINESS PROCESSES

### Accessibility

Accessibility was a common theme occurring in all three goals. Accessibility was identified as a mandatory strategy. The focus is on identifying and enforcing accessibility standards.

GOAL	OBJ	STRAT	DETAILS
G1	O2	2.16	Pursue system enhancements for accessibility. [Mandatory]
G1	O3	3.13	Ensure accessibility.
G2	O4	4.20	Improve timeliness and accessibility of Administrative systems.
G3	O5	5.1	Establish permanent Review Working Groups with participants from B/Os to review the Accessibility Standards as they pertain to IT and then develop FCC IT Accessibility Standards.
G3	O5	5.2	Establish a review process to ensure that all IT programs adhere to the accessibility standards.
G3	O5	5.3	Create a forum to communicate Section 508 accessibility standards to all FCC staff.

### Architecture

Issues related to the IT architecture include both process and system related concerns. The focus is on (1) documenting and publicizing the IT architecture, and (2) defining how to use, maintain, and enforce it.

GOAL	OBJ	STRAT	DETAILS
G1	O1	1.12	Create cross-organization technology review team for architecture duration, and develop experience sharing.
G2	O1	1.3	Establish a review and approval process for additions or changes to established architecture.
G3	O2	2.1	Periodic review by outside organization to evaluate the FCC IT architecture (ensure independence and publicize results).
G3	O2	2.10	Management of the IT architecture must be proactive, not reactive.

GOAL	OBJ	STRAT	DETAILS
G3	O2	2.11	Define HW/SW and procedures for the FCC IT architecture (how does the FCC define components?) and the relationships among the components.
<b>G3</b>	<b>O2</b>	<b>2.12</b>	<b>Publicize ITC efforts concerning IT architecture (publicize the actual architecture).</b>
<b>G3</b>	<b>O2</b>	<b>2.13</b>	<b>Move away from the idea of “non-standard” components. (standardized system). If a component is “mission-critical,” then support it in the architecture.</b>
<b>G3</b>	<b>O2</b>	<b>2.14</b>	<b>Develop mechanism to ensure remaining “non-standard” components will not harm the overall IT architecture.</b>
G3	O2	2.2	Ensure that FCC IT architecture adheres to OMB guidance.
G3	O2	2.3	Centralize the configuration control plan of the FCC IT architecture to ensure that it is all encompassing (applies to all B/Os).
<b>G3</b>	<b>O2</b>	<b>2.4</b>	<b>Provide means for B/Os to get new IT products and technologies added to the IT architecture.</b>
<b>G3</b>	<b>O2</b>	<b>2.6</b>	<b>Develop a prioritization mechanism to implement new technology into the FCC IT architecture.</b>
<b>G3</b>	<b>O2</b>	<b>2.7</b>	<b>Create a detailed IT architecture mapped to business processes and funding sources.</b>
<b>G3</b>	<b>O2</b>	<b>2.9</b>	<b>Map the FCC IT architecture to the FCC business processes and mission goals.</b>

### Budget

Budget related strategies are primarily process related.

GOAL	OBJ	STRAT	DETAILS
<b>G1</b>	<b>O1</b>	<b>1.13</b>	<b>Review budget allocation and procurement process for speed. (i.e., can the process be accelerated?)</b>
<b>G1</b>	<b>O1</b>	<b>1.7</b>	<b>Create budget contingency fund for unplanned changes (no-year funds, allocated by advisory team).</b>

GOAL	OBJ	STRAT	DETAILS
G3	O3	3.1	Provide more two-way accountability (ITC & B/O, ABC/management, COTR/TPOC) for IT budget and procurements.
<b>G3</b>	<b>O3</b>	<b>3.4</b>	<b>Establish an enterprise-wide portfolio management mechanism to perform IT investment reviews for capital assets. (steering committee) tied to the budget process.</b>
G3	O3	3.6	Develop capacity planning program that links approved project needs to the capacity analysis to the budget process.

### Capacity and Capacity Planning

These strategies identified issues related to the systems’ capacity as well as issues related to the planning process focusing on capacity issues. The focus is on implementing capacity planning and management.

GOAL	OBJ	STRAT	DETAILS
<b>G1</b>	<b>O1</b>	<b>1.4</b>	<b>Create reserve hardware capacity for development and production purposes.</b>
G1	O2	2.5	Develop capacity planning estimates based on best (peak load) case scenarios.
<b>G1</b>	<b>O2</b>	<b>2.10</b>	<b>Implement formal capacity planning, contingency to make electronic filing system 100 percent reliable and available.</b>
G2	O1	1.9	Map FCC infrastructure to be able to plan for changes.
G3	O3	3.6	Develop capacity planning program that links approved project needs to the capacity analysis to the budget process.

### Customer Needs

Of particular interest is the fact that all of the strategies identified as customer-focused all occur within goals one and two; none occurred as pertaining to goal three (technical leadership). A case could be made that the ITC’s primary customers are internal FCC staff. Consequently, the ITC must provide technical leadership by meeting the internal needs of the FCC. The focus is on continually and proactively identifying needs and potential solutions.

GOAL	OBJ	STRAT	DETAILS
<b>G1</b>	<b>O2</b>	<b>2.14</b>	<b>Provide a regular forum for sharing problems and customer feedback across B/O electronic filing systems.</b>
G1	O2	2.15	Implement appropriate levels of security and privacy for electronic filing systems to address customer concerns (i.e. digital signature). [Mandatory]
<b>G1</b>	<b>O2</b>	<b>2.9</b>	<b>Implement critical electronic filing system enhancements that are customer driven (e.g. get customer feedback).</b>
G1	O3	3.14	Find out what the customers need – (Palm Pilot support, PDA, wireless).
G1	O3	3.15	Preserve traditional as well as automated support (human).
<b>G1</b>	<b>O3</b>	<b>3.5</b>	<b>Enhance assistance for customer-user interface (chat).</b>
<b>G1</b>	<b>O3</b>	<b>3.7</b>	<b>Implement phone (IVR) for customer support – all input channels. (web, call center, application experts).</b>
<b>G1</b>	<b>O3</b>	<b>3.8</b>	<b>Enhance technical support (e.g. software to manage the help desk).</b>
G2	O3	3.2	Keep customers informed when contractual matters prevent meeting service levels.
G2	O3	3.3	Provide written feedback to B/O customers on meeting service standards.
<b>G2</b>	<b>O3</b>	<b>3.9</b>	<b>Communicate status and expectations to individual customers.</b>
G2	O4	4.7	Explore web-based data delivery solutions (wireless access, accessibility issues).

## Document Management

One of the recurring issues was the sharing of information. This presupposes the ability to capture the requisite information and provide a means to disseminate as well as control the flow of information; Document Management can address those issues.

GOAL	OBJ	STRAT	DETAILS
G1	O1	1.10	Enforce system documentation (i.e. via implementing the SDLC).
G2	O1	1.4	Document all standards and common interfaces where they can be found easily. Enforce them for staff and contractors.
G2	O4	4.11	Explore document management solutions (including version control).
G2	O4	4.14	Ensure data systems are well documented.
G2	O4	4.21	Explore the use of document management tools that will provide ownership, creation, and modification date stamps, security permissions.

**Electronic Filing**

Electronic Filing is already an ongoing activity at the FCC. It is interesting to note how few of the detailed strategies ended up making the final Top Rankings.

GOAL	OBJ	STRAT	DETAILS
G1	O2	2.12	Determine why public and industry can't do electronic filing 100 percent.
G1	O2	2.14	Provide a regular forum for sharing problems and customer feedback across B/O electronic filing systems.
G1	O2	2.15	Implement appropriate levels of security and privacy for electronic filing systems to address customer concerns (i.e. digital signature). [Mandatory]
G1	O2	2.17	Prioritize FCC electronic filing needs across the agency to determine which are 1) biggest bang-for-the-buck, 2) easiest to implement, 3) highest visibility.
G1	O2	2.18	Activate a change management program to orient and train FCC staff on electronic filing system – overcome resistance.
G1	O2	2.2	Determine strategy on FCC Rulemakings (B/O specific or FCC wide) to make electronic filing mandatory.
G1	O2	2.3	Continual assessment of internal processes that will compliment how we move to 100 percent electronic filing.

GOAL	OBJ	STRAT	DETAILS
G1	O2	2.4	Continual assessment of IT infrastructure that will compliment how we move to 100 percent electronic filing.
G1	O2	2.6	Staff planning that is proactive and based on movement toward 100 percent electronic filing.
G1	O2	2.8	Do more rigorous schedule and risk estimates for specific electronic filing initiatives.
<b>G1</b>	<b>O2</b>	<b>2.9</b>	<b>Implement critical electronic filing system enhancements that are customer driven (e.g. get customer feedback).</b>
<b>G1</b>	<b>O2</b>	<b>2.10</b>	<b>Implement formal capacity planning, contingency to make electronic filing system 100 percent reliable and available.</b>
<b>G2</b>	<b>O1</b>	<b>1.5</b>	<b>Assess user needs up front; articulate day-to-day needs beyond routine tasks (e.g., maps, and searches).</b>

### Point of Contact

All point of contact issues appeared in Goal 3. The focus is on making everyone aware of who to go to with specific issues.

GOAL	OBJ	STRAT	DETAILS
G2	O3	3.6	Compile and publish key ITC point-of-contact information (e.g., core hours, after-hours contact procedures).
G3	O1	1.1	Develop and distribute a list of IT points-of-contact and backup with roles and responsibilities (on intranet by function for ITC and B/O) in key areas.
G3	O3	3.7	Establish ITC focal point (CIO) to lead development of FCC policy guidance that complements and maps to Federal IRM policies (ITMRA, A-130) inclusive process with B/Os. Also communicate impact of the rule.
<b>G3</b>	<b>O4</b>	<b>4.5</b>	<b>Create a dedicated technical assessment org/points of contact</b>

**Process**

Process-related issues are numerous and cross all three goals. These deal more with the process of delivering and supporting internal IT services, as opposed to business processes used to support and deliver service to external constituents.

<b>GOAL</b>	<b>OBJ</b>	<b>STRAT</b>	<b>DETAILS</b>
G1	O1	1.1	Review process of Administration Resource Impact statement creation for realism/impact.
G1	O1	1.9	Review Process of FCC’s response to external legislative/policy directives.
G2	O1	1.10	Streamline administrative processes and systems (employees)
G2	O4	4.2	Explore enterprise-wide (all data repositories) backup and archival process solutions.
G2	O4	4.4	Implement new techniques and methods to disseminate the information pertaining to the existing FCC database systems (demos, interactive, web-based, PowerPoint).
G3	O3	3.8	Develop process of yearly reviews for mission critical system to determine if the project should stay the course, increase level effort, modify approach, terminate, re-engineer or replace system.
G3	O4	4.2	Create a continuous formal process (managed by ITC) to identify and assess new technologies, mapped to FCC goals, and maintain supported HW/SW lists.
G3	O4	4.3	Communicate assessments (made in the formal process) to B/O for specific impacts.

**Remote Access**

A case could be made that remote access applies specifically to Goal 2, internal to the FCC. The external customers are primarily concerned with Electronic Filing. None of the following strategies made it to the top rankings.

<b>GOAL</b>	<b>OBJ</b>	<b>STRAT</b>	<b>DETAILS</b>
G1	O3	3.14	Find out what the customers need – (Palm Pilot/PDA, wireless).

GOAL	OBJ	STRAT	DETAILS
G2	O1	1.6	Enhance remote access for field users and other types of remote users; pursue best practices and state-of-the-art solutions (e.g., web, thin client).
G2	O4	4.16	Explore the use of state-of-the-art software tools to access FCC data (internal and external).
G2	O4	4.7	Explore web-based data delivery solutions (wireless access, accessibility issues).

### Security

As with the Accessibility issues, Security issues were mostly mandated.

GOAL	OBJ	STRAT	DETAILS
G1	O2	2.15	Implement appropriate levels of security and privacy for electronic filing systems to address customer concerns (i.e. digital signature). [Mandatory]
G2	O4	4.21	Explore the use of document management tools that will provide ownership, creation, and modification date stamps, security permissions.
<b>G3</b>	<b>O6</b>	<b>6.1</b>	<b>Ensure FCC compliance with OMB Circular A-130 and other Federal directives concerning computer security issues.</b>
<b>G3</b>	<b>O6</b>	<b>6.2</b>	<b>Ensure compliance with Computer Security Act.</b>
<b>G3</b>	<b>O6</b>	<b>6.3</b>	<b>Interface with other agency Computer Security Officers.</b>

### Service

Service is distinct from Customer Service, which focused primarily on determining customer needs. Service focused primarily on defining and using Service Level Agreements between ITC and the Bureaus and Offices.

GOAL	OBJ	STRAT	DETAILS
G1	O3	3.2	Establish speed of service standards.
G1	O3	3.3	Communicate service results.

GOAL	OBJ	STRAT	DETAILS
G1	O3	3.4	Assess speed-of-service, time and quality.
<b>G2</b>	<b>O3</b>	<b>3.1</b>	<b>Create, define, and communicate agency-wide IT service level agreements in accordance with budgetary constraints and union rules that span the FCC (intra-bureau, inter-bureau, ITC/agency), e.g., outage notifications and restore service, Help Desk support, software distribution and impact).</b>
G2	O3	3.10	Perform quality assurance surveys to assess success and quality of service.
G2	O3	3.11	Employ agency-wide solution to monitor, measure, and analyze service levels.
G2	O3	3.2	Keep customers informed when contractual matters prevent meeting service levels.
G2	O3	3.3	Provide written feedback to B/O customers on meeting service standards.
G2	O3	3.4	Tie performance of responsible party to service level agreements (e.g., contract incentives, performance clauses, employee days off).
G2	O3	3.5	Where appropriate, align IT service level agreements with externally published standards.
G2	O3	3.7	Using re-instituted DALO meetings to communicate customer service standards, and promises vs. results.
G2	O3	3.8	Establish a periodic review of service level standards to maintain currency.
<b>G2</b>	<b>O3</b>	<b>3.9</b>	<b>Communicate status and expectations to individual customers.</b>
G3	O3	3.12	Develop guidance for check/balances for production systems.

### Sharing

Sharing applies to information, code and systems, as well as formulating processes to foster sharing. These tend to lean toward data repository solutions.

GOAL	OBJ	STRAT	DETAILS
<b>G1</b>	<b>O1</b>	<b>1.11</b>	<b>Agency-wide application integration that highlights core</b>

GOAL	OBJ	STRAT	DETAILS
			<b>sharing, data standardization, and data warehousing.</b>
G1	O1	1.12	Create cross-organization technology review team for architecture duration, and develop experience sharing.
G1	O2	2.14	Provide a regular forum for sharing problems and customer feedback across B/O electronic filing systems.
G2	O1	1.2	Establish a library of sharable code.
G2	O2	2.16	Identify links between System Owners/COTRs/ Managers to foster information sharing.
G2	O4	4.13	Share data elements across different systems.
G2	O4	4.3	Explore global shared drive concept.
<b>G2</b>	<b>O2</b>	<b>2.6</b>	<b>Create an electronic forum/bulletin board on the FCC intranet for topic-specific information exchange.</b>
<b>G3</b>	<b>O1</b>	<b>1.5</b>	<b>Manage IT knowledge, capture and share, and maintain access to lost knowledge.</b>

### Tools

This refers to software-based tools. The focus is on standardizing the way solutions are developed and implemented.

GOAL	OBJ	STRAT	DETAILS
G1	O1	1.3	Review current tools and create/maintain recommended development tools list (use outside expertise).
<b>G1</b>	<b>O3</b>	<b>3.16</b>	<b>Adopt FCC wide standardization of terms, tools, and navigation for Internet presence.</b>
<b>G2</b>	<b>O4</b>	<b>4.16</b>	<b>Explore the use of state-of-the-art software tools to access FCC data (internal and external).</b>
G2	O4	4.21	Explore the use of document management tools that will provide ownership, creation, and modification date stamps, security permissions.

GOAL	OBJ	STRAT	DETAILS
G3	O3	3.5	More SDLC tools: templates, sample documents, best practices and PIR continually update continually to incorporate reviews of lessons learned from outside FCC.

### Other Types of Business Processes

The following strategies did not appear to apply to any recurring theme. This does not imply that they are not top priority, it simply means they did not appear four or more times as a recurring theme.

GOAL	OBJ	STRAT	DETAILS
G1	O2	2.11	Foster Enterprise perspective (agency-wide view) for common functions like mergers, fee payment.
G1	O3	3.20	Assess option for FCC staff to work 2nd, 3rd shifts, 24x7.
G1	O3	3.6	Ensure redundancy.
G2	O1	1.1	Develop and implement an enterprise-wide dictionary for database applications.
G2	O2	2.2	Reestablish B/O monthly information exchange meetings (DALO).
G2	O4	4.10	Work to ensure there is a Bureau-level coordination of data assets (i.e., database data) (a liaison that knows where the B/O data is stored, a person inside the B/O that is knowledgeable concerning the B/O IT functions and “stuff”).
G3	O1	1.10	Ensure access to new IT expertise prior to losing existing expertise.
G3	O1	1.3	Ensure executive awareness, support, and participation in developing and using IT in the agency.
G3	O1	1.6	Develop and present IT proposal to executives (alternatives, cost to implement versus cost not to implement in priority order).
G3	O1	1.8	Ensure cross training for continuity of operations.
G3	O3	3.14	Develop guidelines for prioritizing critical operational resource

<b>GOAL</b>	<b>OBJ</b>	<b>STRAT</b>	<b>DETAILS</b>
			requests such as fault tolerant, reliable backups.
<b>G3</b>	<b>O4</b>	<b>4.1</b>	Solicit B/O input for new technology opportunities.
<b>G3</b>	<b>O4</b>	<b>4.4</b>	Sponsor open meetings/briefings/presentations by technical vendors.
<b>G3</b>	<b>O4</b>	<b>4.7</b>	Develop common criteria for assessing new technology, as applied to FCC goals.