ODP-81-725
11 June 1981

MEMORANDUM FOR: See Distribution

FROM : [redacted] STATINTL
Acting Chief, Management Staff, ODP

SUBJECT : Department of Commerce's
Computer Science and Technology
Program Plan for FY 1981

1. The effect of Federal Information Processing Standards and associated Publications (FIPS PUBS) on government ADP operations is now far more significant than it was in the past. To assist you in managing the impact of future standards on your programs, I am attaching the FIPS program plan for FY 1981.

2. It should be noted that the Agency recently requested that the authority to waive certain FIPS PUBS be delegated to the DCI. This request was denied by the Secretary of Commerce. Commerce, however, stated they are taking action to delegate in the future waiver authority government-wide to heads of agencies. In the meantime, Commerce agreed that, because of our security concerns, they will assign National Bureau of Standards personnel with appropriate clearances to hear our waiver requests on Agency premises. On 9 June, two waiver requests (one each from ODP and NPIC) were presented as the first test of the agreed procedures.

3. If you should have any questions on the FIPS program, STATINTL please contact me on [redacted]

STATINTL

[redacted]

Attachment: a/s

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COMPUTER SCIENCE AND TECHNOLOGY PROGRAM PLAN:

FEDERAL ADP STANDARDS

FY1981

U.S. Department of Commerce
National Bureau of Standards
Institute for Computer
Sciences and Technology
Washington, D.C. 20234

COMPUTER SCIENCE AND TECHNOLOGY

PROGRAM PLAN: FEDERAL ADP STANDARDS

I. PROGRAM OVERVIEW

The Institute for Computer Sciences and Technology is one of three major technical organizations in the National Bureau of Standards. The basic mission of the National Bureau of Standards is to develop national standards of measurement for use in scientific investigations, engineering, manufacturing, and commerce. NBS' expertise in science and engineering is applied toward national goals such as (a) continued economic development and enhanced innovation and productivity in industry and commerte through optimal utilization of labor, energy, and material resources; (b) reasonable and equitable regulatory decision-making that achieves legislative goals effectively and efficiently without imposing unnecessary burdens on the economy, on individuals, on public or private organizations, or on State or local governments; (c) equity in commerce through mutual understanding and acceptance of recognized transfer standards; (d) accuracy and compatibility in scientific communication and technology transfer among industry, government, and academia.

The Federal ADP (automatic data processing) Standards Program is carried out by the Institute for Computer Sciences and Technology (ICST) at the National Bureau of Standards (NBS) under Public Law 89-306 (79 Stat. 1127), commonly known as the Brooks Act. The Brooks Act provides for the "economic and efficient purchase, lease, maintenance, operation and utilization of automatic data processing equipment by Federal departments and agencies."

The following responsibilities assigned to the Secretary of Commerce under P.L. 89-306 have been delegated to ICST:

- to provide Federal agencies with scientific and technological advisory services for ADP and related systems,
- to develop and recommend the establishment of uniform Federal ADP standards; and
- to undertake necessary ADP research.

Guidance and directives concerning these responsibilities are contained in the December 16, 1966, letter from OMB to the Secretary of Commerce and Executive Order 11717, dated May 9, 1973. Specific new assignments to the Department of Commerce (NBS), consistent with its Brooks Act responsibilities, are mandated in OMB Circular A-108, dated July 1, 1975, and OMB Circular A-71, Transmittal Memorandum No. 1, dated July 27, 1978.

This Computer Science and Technology Program Plan describes ICST's overall goals and objectives in carrying out its Brooks Act responsibility for Federal ADP standards. It provides the framework of a moving five-year horizon for developing ADP standards based on current assessments of technology and Federal need. For

the near-term, the plan details the standards to be developed; for the out-years, the plan indicates broad areas of need for future development. As the horizon moves, on-going Federal needs and technology assessments permit a more definitive set of standards to be planned from the broad general areas. An annual update documents the modifications and refinement of the Program Plan.

This plan presents current Federal needs for ADP standards and reflects ICST's experiences in managing the revitalized Standards Program for the past two years, its discussions with Federal agencies, technological developments, and recent Federal ADP policy changes.

ICST's planning and evaluation process provides for continued review of its programs by Federal agencies and for the development of studies and analyses that provide timely information on Federal ADP standards needs and use. The data and requirements developed in this process are used to select and improve standards and guidelines and to assess the effectiveness of the program. As changes and adjustments to the program are needed, they will be covered in future revisions to this Program Plan.

To help agency officials and the public understand the standards program, ICST has prepared a guidebook that describes the procedures used in the development and evaluation of standards. Entitled, "Guide to the Federal ADP Standards Program," this publication covers the processes for selecting standards for development, establishing priorities for standards development, involving agencies and the public in reviewing standards, and cooperating with voluntary standards groups.

ICST's progress in carrying out the standards program is reported annually in the "Federal ADP Standards Program: Annual Report," available from ICST.

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II. FEDERAL ADP MANAGEMENT NEEDS

The Federal government's ADP resources represent a large and growing investment of Federal funds. Expenditures for the general purpose data processing activities of the Federal agencies were about $4.7 billion in FY1979, $5.2 billion in FY1980, and are expected to reach $6.0 billion in FY1981, according to the Office of Management and Budget (OMB) statistics. The number of computers in the Federal inventory is also increasing. Between FY1977 and FY1981, the number of Federal computers is expected to increase from 11,418 to 18,153. The Federal Government is a large and influential user of computers. It is also among the more sophisticated users of computers, especially in its defense and space programs.

Federal agencies are finding themselves increasingly dependent on the use of computers for carrying out programs and delivering essential public services. Computers can make it possible for agencies to expand and improve programs and services without increasing the Federal workforce or Federal costs. However, the impact of computer technology on the performance of government functions demands that this technology be managed as effectively and efficiently as possible.

A major challenge to the Federal government's ability to use and manage computers effectively is the rapidly changing nature of the technology. Over the past decade, there has been a dramatic improvement in computer capabilities resulting in new products and new users. Developments in semiconductor technology have brought significant declines in computer costs. Communications costs have also been declining although not so markedly as hardware costs. Software-related costs, on the other hand, now exceed the cost of ADP hardware.

The Federal Government's growing investment in computers, its increasing dependence on them, and rapidly changing technology are dynamic conditions that affect the ability of Federal agencies to manage and use ADP technology effectively. In recent years, the goal of better ADP management and use has received high level attention from the Congress, the General Accounting Office, and the Office of Management and Budget. Some related reports on the subject are referenced in Appendix 1.

ADP standards have long been recognized as powerful tools for improving Federal ADP and assuring the uniform quality and interchangeability of products. Standards help to make skills and data interchangeable, thus reducing training costs and duplication of effort. Standards improve capabilities for adding on to existing systems by assuring correct operation of components and subsystems, and they help to reduce costs by fostering competition in the marketplace.

ICST's ADP Standards Program is directed toward helping the Federal government meet the challenges of today's computer environment -- using computers efficiently and effectively, reducing growing software costs, and taking advantage of cost-effective new technology.

III. PROGRAM GOALS AND OBJECTIVES

The goals of the Federal ADP Standards Program are to develop, issue, and maintain standards and guidelines needed for: (1) competitive and economic procurement of Federal computer systems, components and services, (2) life-cycle efficiency and effectiveness of Federal computer resources and their utilization, (3) portability of data, software and technical skills across computer systems, (4) protection of computer systems and networks against unauthorized access, manipulation or abuse, (5) reduction of waste, error and unnecessary duplication in the applications of computer systems, and (6) increased productivity of the Federal workforce. Standards and guidelines are issued as Federal Information Processing Standards (FIPS).

ICST's specific objectives for reaching the goals of the Federal ADP Standards Program are as follows:

- Develop and maintain a comprehensive plan for the development of Federal ADP standards and guidelines.
- Establish close communications with Federal agencies to determine needs for Federal standards and guidelines.
- Conduct technology forecasts to anticipate future needs for Federal standards and guidelines.
- Coordinate with and support voluntary standards-making organizations to assure timely, efficient and industry-compatible standards development.
- Perform cost/benefit analyses of proposed standards to predict their expected economic impact.
- Produce and test standards for Federal ADP systems using a balanced combination of in-house technical expertise and specialized contractor assistance.

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- Promulgate and assure widespread dissemination and implementation of standards.
- Develop methods and procedures to monitor Federal agency compliance with and assess impact of mandatory standards.
- Report annually to OMB and the Congress on progress in meeting the objectives of the standards program.

IV. PROGRAM SCOPE

The Federal ADP Program addresses four major areas of Federal ADP use: (1) Software, (2) Data, (3) Operations, and (4) Interfaces. Software refers to the step-by-step procedures (programs) that control computer operations to produce useful results--from solving complex differential equations to issuing paychecks. Data includes information such as facts, values, instructions, and other symbols that are processed to produce information for decision-making and management. Operations provide for the proper combination of computing resources--hardware (equipment), software, data, personnel and procedures--to support the execution of software and the manipulation of data. Interfaces refer to the specification of connections--both hardware and software--that are needed to permit the controlled flow of information between computers, computing components, and processes. These four areas are, in turn, divided into groups, or "families," of standards. The families which have been funded in FY1981 are identified in Table 1. These families have been selected on the basis of potential benefit to the government and immediate Federal need. The standards areas and their constituent families are shown in Table 2. Needed standards are included in this Program Plan to the extent possible under current funding.

Software

The software area is addressed by two families of standards: High Level Programming Language and Software Quality. The costs of software development and maintenance already exceed Federal computer equipment costs, and the changing economics of the technology (i.e., cheaper hardware, more expensive labor) is widening the gap. Much of the software used by Federal computers is produced and maintained by government programmers. In addition, Federal agencies spend hundreds of millions of dollars each year on software development by commercial software vendors and in the purchase of off-the-shelf software. Yet many of the programs used by the Federal government contain errors, lack documentation, and are difficult to use on computers other than the ones for which they were originally written.

The same kind of effort encountered in attempting to move software from one location to another is required every time an agency decides to replace an obsolete or saturated computer with one from another manufacturer. Federal procurement regulations require open competition among vendors when agencies acquire new computer systems. Yet the cost of converting software from the old to a new system can cancel out the savings of better hardware cost/performance. Similarly, computer programmer skills are frequently not transferable from one system to another.

TABLE 1: FY81 Funding

Federal ADP Standards Program

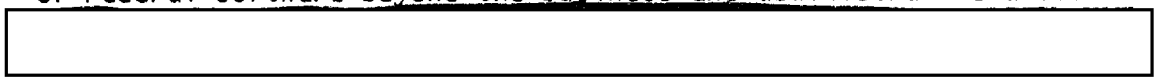
(funding shown in thousands of dollars)

Standards Families	FY1981 Funding
High Level Programming Language	$ 1043.
Software Quality	885.
Computer System and Network Interface	5972.
Database Management	1921.
Computer Security and Risk Management	1042.
System Selection and Evaluation	602.
Data Elements and Representations	287
TOTAL	11752.

TABLE 2: Standards Areas
and Families
FY1981

Areas	Families
Software	High Level Programming Language
	Software Quality
Data	Data Elements and Representations
	Database Management
Computer Operations	System Selection and Evaluation
	Computer Security and Risk Management
	Performance Assurance
	Computer System Functional Specification
Interfaces	Computer System and Network Interface
	Computer Based Office Automation System

Software standards are intended to reduce duplication of effort and other inefficiencies in producing computer software in the Federal government. The High Level Programming Language family develops Federal standard versions of major programming languages in order to minimize the wasteful effects of programming dialects and local variations. Such standards define languages that should look the same to any manufacturer's computer and to any programmer trained in the standard version. Although many programming languages have been developed to simplify and otherwise improve the task of writing programs, only one language--COBOL--had been made a Federal standard prior to the strengthening of the ADP standards program in FY1979. Two others, FORTRAN and Minimal BASIC, have now been made Federal standard languages. COBOL, a widely used higher level programming language, is designed for business and administrative tasks in which the manipulation of data and the generation of reports tend to be more important than the solution of mathematical formulas. FORTRAN, used for scientific, computational problems, and BASIC, for short interactive problem solution, make possible the portability of Federal software beyond the business and administrative areas.



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The Software Quality family of standards is designed to increase the productivity and effectiveness of computer programmers regardless of the language they use. In this family the software development process is partitioned into its component phases--design, coding, specification, and testing--and for each phase, standards of good practice that have been shown to lead to better, more efficient and more easily maintained software systems are recommended.

Data

The second major ADP area addressed by the Standards Program is data handling. Two families have been created to lead to improvements in this area: Data Elements and Representations and Database Management. The overall goal in these families is to insure that computer users have economical and effective means to record, validate, manipulate and exchange data.

Helping Federal agency users to interchange and use common data effectively is the general objective of the Data Elements and Representations family of standards (formerly called Data Standards family). The Federal government maintains thousands of data bases, some of which contain millions of individual items of data. The end users of this data (administrators, scientists, doctors, clerks, etc.) must learn new data names, formats and codes for every new source of essentially similar data that they consult. For example, the name "California" may be represented in a variety of formats such as Calif., Cal., CA. Without standards, any of these formats could be used to represent the State of California in data bases, but only use of that specific format would elicit the desired information from the database. Standards in Data Elements and Representations establish a single, unambiguous point of reference for the content and format of the most commonly used data elements found in the Federal data inventory.

The Database Management family approaches the problems of data handling in terms of the principal software components used to access and manipulate data. Database Management Standards and guidelines are intended to insure a family of flexible and uniform software systems by which data is linked, structured, and accessed as information. The need for rapid data access has existed for many years, and the primary instruments of progress in this area have been general purpose software packages (database management systems) that automatically perform routine formatting, storing, and accessing tasks needed to get data in and out of computers. Unfortunately, development of this useful and increasingly necessary software has been fragmented and uncoordinated, with the result that conversion and transfer of personnel from one package to another cause major technical redesign and retraining, often as great as the initial applications development. Moreover, the capability of these systems varies considerably, and their demand for resources (core storage, computer time, and disk space) is often expensive and unpredictable. Database Management Standards are designed to reduce the inconsistencies and incompatibilities between data management systems, to reduce personnel costs of interacting with computer-based information, and to increase the accessibility of information sources for authorized end users (generally non-ADP specialists) who depend upon such access to carry out their agency mission.

Operations

The third major area of Federal ADP, Computer Operations, currently includes four families of standards: System Selection and Evaluation, Computer Security and Risk Management, Performance Assurance, and Computer System Functional Sepcification. Computer Operations involve the problems faced by the managers and technical personnel who plan, acquire and run medium-to-large scale computer installations. One family, System Selection and Evaluation (formerly called Performance Measurement and Evaluation), provides technical guidance in the use of quantitative and analytical methods to improve computer operations throughout the life cycle of a computer including the acquisition of computer systems and services; another, Computer Security and Risk Management, provides guidance in a problem that faces all computer installation and information systems managers in the Federal government today: the protection of computer-based data, software, and systems against unauthorized access, abuse, and accidents.

The System Selection and Evaluation family is designed to help computer installation managers satisfy the information processing requirements of their agencies at the least possible cost to the government. Installation managers, to be effective, must address three major problems. First, they must insure that the demands placed on the agency's computers reflect genuine need. Second, they must help insure that the translation of agency needs into software systems makes efficient use of available computing resources. And third, they must recognize

current and future needs well enough to acquire the most appropriate (i.e., cost-effective) set of computing resources to satisfy these needs. System Selection and Evaluation standards and guidelines provide managers with a quantitative technical basis for measuring and forecasting workload, estimating capacity of computer systems and networks, controlling the day-to-day operation and maintenance of computer resources, and acquiring new computer systems or services.

The Computer Security and Risk Management family responds to a tasking of NBS pursuant to OMB Circular A-108 and OMB Circular A-71, Transmittal Memorandum No. 1. These directives call for the development of technical standards and guidelines needed by Federal agencies to develop safe, reliable, and secure computer systems. The technical problems of making computer software and hardware less vulnerable to abuse, accidents, and errors are formidable. The NBS program in Computer Security and Risk Management addresses these technical problems through development of methods and procedures to assess potential threats (criminal abuse, physical intrusion, accidents, natural disasters); to assure that use of computing resources is authorized; to evaluate and establish technical evaluation of computer security; and to audit ADP procedures and techniques for possible misuse or abuse.

Performance Assurance standards and guidelines are needed to assure that computer systems perform their functions correctly; these standards deal directly with the problem of computer errors that affect public privacy, health, and safety. ICST is addressing a part of the need for technical, ADP-related standards in this area under the Computer Security and Risk Management and Software Quality families. However, additional requirements exist for effective ADP standards and guidelines in such areas as system auditing, integrity, and computer hardware reliability.

Computer System Functional Specification standards are required to permit agencies to procure computer systems and services on a fully competitive basis by specifying requirements in terms of end use, rather than specific resources (equipment, software, etc.) for meeting requirements. A part of these needs is addressed within the System Selection and Evaluation family. However, a major need remains in the area of Federal ADP requirements analysis and definition.

Interfaces

The fourth area of Federal computing addressed by the Standards program is the need for generalized interfaces between computers and computer components. One family, Computer System and Network Interface, includes a wide range of standards and guidelines in this area. The interface problem is an extension of the software and data compatibility issues identified earlier. For example, without standard equipment interfaces, independent manufacturers of peripheral equipment (printers, tape, and disk components) are

unable to compete with major computer manufacturers when such products are needed to augment existing systems. As a result, installation managers are unable to buy peripheral equipment in a competitive marketplace and to interconnect components made by different manufacturers.

Similar problems exist throughout the computer industry. In computer-based office systems, text or information stored on one typewriter terminal may be inaccessible to the terminal beside it. In large networks, linkages can be established and widely distributed resources pooled only through a multi-level set of protocols. The flexibility of a computer network and the capability it can offer its member nodes depend largely on the generality and performance of the protocols through which it establishes communication. The Computer System and Network Interface family develops such standards and guidelines at the level of mini-, micro-, and large scale centralized computer facilities; local area networks; and geographically distributed computer networks.

Computer-Based Office Automation System standards and guidelines would help assure the efficient and effective integration of this new technology into Federal agencies. A limited effort to meet these needs has been initiated under the Computer System and Network Interface family.

A summary of funded family development plans is included in Appendix 3. Descriptions of standards and guidelines under development are included in Appendix 4.

V. ADVISORY SERVICES AND RESEARCH PROGRAMS

Technological Advisory Services

Since the early 1950's NBS has provided reimbursable technical advisory services to other Federal agencies in the selection and application of computer technology. These technical assistance activities cover a broad spectrum of projects: technical feasibility studies; design of ADP systems; evaluation of vendor proposals for computer systems; technical monitoring of systems development; and computer security projects and risk assessments. ICST has recently noted strong interest in agency technical assistance for analysis of ADP life-cycle costs, use of distributed computer systems, evaluation and selection of database management systems, use of advanced software tools and techniques, and microprocessor applications.

Working with Federal agencies in these areas provides valuable insights into changing ADP problems, and enriches ICST's ability to plan for meaningful and needed Federal standards in carrying out the Brooks Act. The appropriate scope and level of ICST technological advisory services is currently under review.

Computer Science and Technology Research

The need for a long-term computer science research program to support the ICST's Brooks Act mandated responsibilities has been widely recognized. Such research activities would enable ICST to anticipate future Federal standards needs and to maintain staff competence for both advisory services and ADP standards activities.

Specific objectives of an ICST research program, as stated in the OMB Policy Guidance letter of 1966, include the following:

1. To supplement agency research efforts when necessary to meet governmentwide requirements or to provide solutions to problems of concern to several different agencies.

2. To initiate efforts to solve large-scale and difficult problems sufficiently unique to special needs of government that outside interests are not likely to undertake vigorous and timely action.

3. To evaluate and apply advanced concepts to the development, organization and implementation of automatic data processing, computer and related systems, including the innovation or extension of techniques needed for improved cost effectiveness in the conduct of agency programs through the use of computers and related techniques.

4. To conduct exploratory research in order to provide the technological bases for future standardization activities and to maintain the competence of the technical staff engaged in technical advisory services, testing and evaluation, and standardization activities.

5. To identify continuing computer science and technology research and development requirements for use by the Institute, other agencies, industry, academic and other organizations in planning and coordinating R and D programs.

Planning is currently underway to identify appropriate research areas for early consideration as the foundation of a Computer Science and Technology Research Program that will support these objectives.

VI. FUTURE DIRECTIONS

Starting from its current posture--a program devoted almost exclusively to the development, promulgation and management of Federal ADP Standards--ICST's long-range strategy is to achieve a balanced three-part program with efforts devoted to (1) standards, (2) technical advisory services, and (3) research.

The NBS Computer Science and Technology activity deals with a complex, evolving technology that has great potential for improving efficiency and productivity in the Federal government. Many problems in ADP operations and management exist. Through a carefully planned and managed program of standards, technical assistance, and research, agencies can be helped to understand technology advances and use them effectively to improve programs and services for the public.

APPENDIX 1

Related Reports and Studies

APPENDIX 1

Related Reports and Studies

In recent years high level executive and legislative branch organizations have shown strong interest in the government's management and use of ADP. Some expressions of that interest include:

Procurement of ADP Resources by the Federal Government, October 1, 1976, House Committee on Government Operations Report on Administration of Public Law 89-306 (Report on June 29, 1976 Hearings).

Identifies significant problems in the management of Federal ADP; concludes that Public Law 89-306 "while providing significant benefits has neither been satisfactorily administered nor effectively implemented to its fullest potential;" recommends that GSA, OMB, NBS, and the user agencies join together in a commitment to fully support and adhere to the provisions of the Act.

Computer Security in Federal Programs, February 1977, Senate Committee on Government Operations Report.

Addresses computer security problems in the Federal government; recommends that OMB take steps to assure that agencies improve the security of their computer systems, especially those that distribute public funds and those that process private and valuable data.

Summary Report, April 1979, President's Federal Data Processing Reorganization Project, an in-depth study organized by the Office of Management and Budget.

Addresses problems of management and use of ADP in Federal agencies; cites public complaints about delays and inaccuracies in the delivery of services, inadequate protection of rights and privacy of individuals, the growing obsolescence of equipment, systems, and personnel, and a threatened loss of U.S. leadership information technology.

Study of the Acquisition of Peripheral Equipment for Use with Automatic Data Processing Systems, June 1969, General Accounting Office Report B-115369.

Recommends that Federal agencies replace leased components with plug-to-plug compatible units and that guidelines for the evaluation and selection of plug-to-plug compatible equipment be developed.

Acquisition and Use of Software Products for Automatic Data Processing Systems in the Federal Government, June 1971, General Accounting Office Report B-115369.

Recommends that OMB provide coordinated management and central policy direction to users in obtaining computer software; that GSA improve software procurement and contracting procedures; and that NBS promulgate standards for computer languages and program documentation.

Opportunity for Greater Efficiency and Savings Through the Use of Evaluation Techniques in the Federal Government's Computer Operations, August 1972, General Accounting Office Report B-115369.

Recommends the development of computer performance evaluation techniques to improve the efficiency of computer operations.

Emphasis Needed on Government's Efforts to Standardize Data Elements and Codes for Computer Systems, May 1974, General Accounting Office Report B-115369.

Recommends the development of standards and standards priorities for data elements and codes, and the development of guidelines, methodology, and criteria for agency standardization efforts.

Improvement Needed in Documenting Computer Systems, October 1974, General Accounting Office Report B-115369.

Recommends the issuance of guidance to agencies in documenting computer systems.

Increased Use of Computer-Output-Microfilm by Federal Agencies Could Result in Savings, November 1974, General Accounting Office Report B-115369.

Recommends that agencies investigate whether computer-output-microfilm use could increase productivity and lower the cost of information systems; encourages agencies to share COM equipment.

Executive Branch Action on Recommendations of the Commission on Government Procurement, March 1975, General Accounting Office Report PSAD-75-61.

Recommends the development and issuance of a set of standard programs to be used as benchmarks for evaluating vendor ADP proposals.

Uses of Minicomputers in the Federal Government: Trends, Benefits, and Problems, April 1976, General Accounting Office Report FGMSD-75-53.

Recommends the development of high level programming language standards to help reduce the cost of converting programs from large-scale data processing systems to minicomputers.

Improvements Needed in Managing Automated Decisionmaking by Computers Throughout the Federal Government, April 1976, General Accounting Office Report FGMSD-76-5.

Recommends that NBS issue technical guidelines for developing, using, technically evaluating, documenting, and modifying automated decision applications to assure that problems are detected and corrected promptly.

Managers Need to Provide Better Protection for Federal Automatic Data Processing Facilities, May 1976, General Accounting Office Report FGMSD-76-40.

Recommends that agencies use NBS guidelines for protecting data processing assets and data when developing and implementing physical security and risk management programs.

Millions in Savings Possible in Converting Programs from One Computer to Another, September 1977, General Accounting Office Report FGMSD-77-34.

Recommends that NBS select and publish a standard set of programming aids for governmentwide use to improve the original development of software and its later maintenance and conversion.

New Ways of Preparing Data for Computers Could Save Money and Time and Reduce Errors, July 1978, General Accounting Office Report FGMSD-78-39.

Recommends that NBS develop guidelines for agencies to use when reviewing their data entry methods or when planning to change them.

The Federal Information Processing Standards Program: Many Potential Benefits, Little Progress, and Many Problems, April 1978, General Accounting Office Report FGMSD-78-23.

Recommends that Secretary of Commerce develop and implement procedures for justifying, setting priorities for, and monitoring the development of standards; commit more existing resources to developing standards; develop and establish standards unilaterally if the commercial process takes too long; coordinate Federal agency participation in commercial standards development; establish budgeting and cost reporting system to give more information on ICST program, and submit a design for an accounting system.

Database Management Systems -- Without Careful Planning There Can Be Problems, June 1979, General Accounting Office Report FGMSD-79-35.

Recommends that NBS develop technical guidelines in collaboration with GSA to help Federal agencies determine when to use a database management system; to evaluate and select DMS on a competitive procurement basis; and develop a family of DBMS standards that recognizes diverse user needs.

Contracting for Computer Software Development -- Serious Problems Require Management Attention to Avoid Wasting Additional Millions, November 1979, General Accounting Office Report FGMSD-80-4.

Recommends that Secretary of Commerce, through NBS and GSA, issue specific guidelines to assist Federal agencies in recognizing and dealing with the unique factors added to custom software development when it is done by contract.

Most Federal Agencies Have Done Little Planning for ADP Disasters, December 1980, General Accounting Office Report AFMD-81-16.

Recommends that OMB ensure, through the Department of Commerce, the development of standards for ADP backup plans.

APPENDIX 2

High Priority Families of Standards

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High Priority Families of Standards

ICST has identified ten families of standards that are needed to improve the management and use of ADP by Federal agencies. These families of standards which address concerns about Federal ADP expressed by Congress, the Office of Management and Budget, the General Accounting Office, and the Federal agencies are being developed to the extent possible under current funding. The families described here represent changes to the ten families of standards previously identified in the June 1979 Computer Science and Technology Program Plan.

High Level Programming Language standards and guidelines to improve programmer productivity, improve transportability of both programs and programming skills, and improve program development and maintenance.

> These standards and guidelines cover existing programming languages originally developed for business and scientific applications, improved languages to be standardized for both programmer and general use, and standard protocols for efficient use of computers and networks.

Software Quality standards and guidelines to improve the efficiency of computer program development and maintenance and to reduce errors in software systems.

> These standards and guidelines cover recommended good practices for the software development process including design, specification, and testing.

Computer System and Network Interface standards and guidelines to permit the interconnection of competitively procured components in computer systems and networks and to facilitate the effective use of networks.

> These standards and guidelines include specifications for connecting peripheral devices to computer systems, procedures and formats for exchanging data and files, issuing commands, and communicating through computer networks.

Database Management standards and guidelines to reduce information system conversion problems and to provide more effective use of data files.

> These standards and guidelines cover data description and documentation; data system planning and specification; database software specification, evaluation, and selection; system performance management; data translation and system conversion; and database reorganization and maintenance.

Computer Security and Risk Management standards and guidelines to protect information and reduce risks and vulnerabilities in computer systems and networks and to assure that computer systems do not perform unintended functions.

These standards and guidelines cover techniques and methods to control access to computers and networks, data encryption to protect information in transmission between computers, physical security measures, and controls for applications systems.

System Selection and Evaluation standards and guidelines to improve the management of installed computer systems and provide for the most cost-effective acquisition of computer systems and services.

These standards and guidelines cover quantitative methods for measuring and forecasting workload, estimating the capacity of computer systems and networks, controlling the day-to-day operation and maintenance of computer resources, and acquiring new computer systems or services.

Data Elements and Representations standards to facilitate the use and interchange of data in machine sensible form.

These standards cover the identification and definition of data elements and their representations and structure as required for the collection, processing, and interchange of machine sensible data.

The following families of standards are needed to respond to Federal policies for computer security, specification of ADP equipment in procurement actions, and use of computer based office systems.

Performance Assurance standards and guidelines to assure that computer systems perform their functions correctly.

These standards and guidelines include software and hardware requirements to control computer errors that affect public privacy, health, and safety.

Computer Based Office Automation System standards and guidelines to help assure the efficient and effective integration of this new technology into Federal agencies.

These standards and guidelines cover the cost-effective selection and use of computer based office automation systems and the specification of capabilities required for system components to exchange data.

Computer System Functional Specification standards and guidelines to permit agencies to procure computer systems and services on a fully competitive basis by specifying requirements in terms of end use, rather than specific resources for meeting requirements.

These standards and guidelines cover aids for analyzing and defining ADP requirements in functional terms in order to reduce costs and improve competition in the acquisition of ADP systems and services.

APPENDIX 3

Summary of Funded Family Development Plans

HIGH LEVEL PROGRAMMING LANGUAGE

Existing Standards and Guidelines		Dates of Issuance
FIPS PUB 21-1	Common Business Oriented Language (COBOL)	1975 December 1
FIPS PUB 29	Interpretation Procedures for Federal Standard COBOL	1974 June 30
FIPS PUB 43	Aids for Program COBOL Conversion (FIPS PUB 21-1)	1975 December 1
FIPS PUB 47	Federal Standard COBOL Pocket Guide	1977 February 1
FIPS PUB 68	Minimal BASIC	1980 September 4
FIPS PUB 69	FORTRAN	1980 September 4

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Needed Standards and Guidelines	(Fiscal Year)
Interpretation Procedures for FIPS Programming Languages (FIPS 29 Revision)	1981
COBOL (Revision)	1982
PASCAL	1982
Extended BASIC	1983
FORTRAN (Revision)	1985

SOFTWARE QUALITY

Existing Standards and Guidelines		Dates of Issuance
FIPS PUB 11	Vocabulary for Information Processing	1977 September 3
FIPS PUB 20	Guidelines for Describing Information Interchange Formats	1972 March 1
FIPS PUB 24	Flowchart Symbols and Their Usage in Information Processing	1973 June 30
FIPS PUB 30	Software Summary for Describing Computer Programs and Automation Data Systems	1974 June 30
FIPS PUB 38	Guidelines for Documentation of Computer Programs and Automated Data Systems	1976 February 15
FIPS PUB 44	COBOL Coding Form	1976 September 1
FIPS PUB 53	Transmittal Form for Describing Computer Magnetic Tape File Properties	1978 April 1
FIPS PUB 64	Guidelines for Documentation of Computer Programs and Automated Data Systems for the Initiation Phase	1979 August 1

Needed Standards and Guidelines	Planned Completion Date (Fiscal Year)
Tools Taxonomy	1982
General Guideline for Validation, Verification, and Testing	1982
Guidance on Conversion Tools	1982
Guideline for Validation, Verification and Testing for Business Data Processing	1983
Guidance on Conversion Techniques	1983
Management Guide for Software Documentation	1983

COMPUTER SYSTEM AND NETWORK INTERFACE

Existing Standards and Guidelines		Dates of Issuance
FIPS PUB 1-1	Code for Information Interchange	1980
FIPS PUB 2	Perforated Tape Code for Information Interchange	1968 November 1
FIPS PUB 3-1	Recorded Magnetic Tape for Information Interchange (800 CPI, NRZI)	1973 June 30
FIPS PUB 7	Implementation of Code for Information Interchange	1969 March 7
FIPS PUB 13	Rectangular Holes in 12-Row Punched Cards	1971 October 1
FIPS PUB 14-1	Hollerith Punched Card Code	1980
FIPS PUB 15	Subsets of Standard Code for Information Interchange	1971 October 1
FIPS PUB 16-1	Bit Sequence of Code for Information Interchange in Serial-by-Bit Data Transmission	1977 September 1
FIPS PUB 17-1	Character Structure and Character Parity Sense for Serial-by-Bit Data Communication in Code for Information Interchange	1977 September 1
FIPS PUB 18-1	Character Structure and Character Parity Sense for Parallel-by-Bit Data Communication in Code for Information Interchange	1977 September 7
FIPS PUB 22-1	Synchronous Signaling Rates Between Data Terminal and Data Communication Equipment	1977 September 1
FIPS PUB 25	Recorded Magnetic Tape for Information Interchange (1600 CPI, PE)	1973 June 30
FIPS PUB 26	One-Inch Perforated Paper Tape for Informtion Interchange	1973 June 30
FIPS PUB 27	Take-up Reels for One-Inch Perforated Tape	1973 June 30
FIPS PUB 32	Optical Character Recognition Character Sets	1975 August 15

FIPS PUB 33	Character Set for Handprinting	1974 October 1
FIPS PUB 35	ASCII Code Extension Techniques in 7 or 8 Bits	1975 June 1
FIPS PUB 36	Graphic Representation of Control Characters of ASCII	1975 June 1
FIPS PUB 37	Synchronous High Speed Data Signaling Rates Between Data Terminal Equipment and Data Communications Equipment	1975 June 1
FIPS PUB 40	Guidelines for Optical Character Recognition Forms	1976 May 1
FIPS PUB 50	Recorded Magnetic Tape for Information Interchange 6250 cpi (246 cpm), Group Coded Recording	1978 February 1
FIPS PUB 51	Magnetic Tape Cassettes for Information Interchange (3.810 mm (0.150 in) Tape at 32 bpmm (800 bpi), PE)	1978 February 1
FIPS PUB 52	Recorded Magnetic Tape Cartridge for Information Interchange 4-Track, 6.30 mm (1/4 in), 63 bpmm (1600 bpi), Phase Encoded	1978 July 15
FIPS PUB 54	Computer Output Microform (COM) Formats and Reduction Ratios, 16 mm and 105 mm	1978 July 15
FIPS PUB 56	Guidelines for Managing Multivendor Plug-Compatible ADP Systems	1978 September 15
FIPS PUB 57	Guidelines for the Measurement of Interactive Computer Service Response Time and Turnaround Time	1978 August 1
FIPS PUB 60	I/O Channel Level Interface	1979 February
FIPS PUB 61	Channel Level Power Control Interface	1979 February
FIPS PUB 62	Operational Specifications for Magnetic Tape Subsystems	1979 February
FIPS PUB 63	Operational Specifications for Rotating Mass Storage Subsystems	1979 August
FIPS PUB 67	Guideline for Selection of Data Entry Equipment	1979 September 1

FIPS PUB 71	Advanced Data Communications Control Procedures	1980 March
FIPS PUB 72	Guideline for the Measurement of Remote Batch Computer Service	1980 May 1
FIPS PUB 78	Guideline for Implementing Advanced Data Communications Control Procedures (ADCCP)	1980 September 26
FIPS PUB 82	Guideline for Inspection and Quality Control for Alpha-numeric Computer Output Microforms	1980 November
FIPS PUB 84	Microform COM Reader	1980 September 19
FIPS PUB 85	Optical Character Recognition (OCR) Inks	1980 September 25
FIPS PUB 86	Additional ASCII Controls	1980 December 9
*	Parallel Recorded Magnetic Tape Cartridge for Information Interchange	

* FIPS number to be assigned when document is signed by the Secretary of Commerce.

Needed Standards and Guidelines

[redacted] (Fiscal Year)

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Large Scale System Interfaces

Operational Specifications for Fixed Block Rotating Mass Storage	1981
Operational Specifications for High Capacity Disk	1982
High Speed Channel Interface	1984

Minicomputer and Microcomputer Interfaces

Minicomputer Device Interface	1981
Minicomputer Bus Interface	1982
Microcomputer Interface	1984

Data Communications

Terminal Communications Interface	1981
Host Computer Interface	1981

Data Communication System Performance Parameters	1982
Bit Oriented Data Link Control (Revision)	1982
Data Communication System Measurement Methodology	1984
High Level Network Protocols	
Transport Control Protocol	1981
Session Control Protocol	1981
File Transfer Protocol	1982
Network Virtual Terminal	1982
Common Command Language	1982
Remote Job Entry	1983
Network Interconnection	1983
Network Interprocess Communication	1984
Network Distributed Data Management	1985
ILLEGIB	
Message Interchange Format	1981
Guideline on Selection Criteria for Local Networking Technology	1981
ILLEGIB	1982
	1982
Device Connection Standard for Local Area Networking	1983
Message System Protocol	1983
Message Processing Directives	1984
ILLEGIB	1984
Data Input/Output	
Data Input/Output Standard	1984
Data Interchange (Magnetic Media)	
Recorded Magnetic Cassette Standard	1981

Recorded Magnetic Flexible Disk Cartridge for Information Interchange	1982
Recorded Magnetic Tape Minicassette Standard	1982
Self-loading Computer Tape Cartridge Mechanical Specification	1983
Guideline on Handling of Computer Magnetic Storage Media	1983
Very High Density Recorded Magnetic Tape Standard	1984

Data Interchange (OCR/COM)

Character Sets for OCR (FIPS PUB 32 Revision)	1981
OCR Character Positioning Standard	1981
Guideline on OCR Print Quality	1982
MICR Read Optically Standard	1982
Hand Print Character Set (FIPS PUB 33 Revision)	1983

Data Interchange (ASCII Code Standards)

Graphic Representation of ASCII Controls (FIPS PUB 36 Revision)	1981
Subsets of ASCII (FIPS PUB 15 Revision)	1982
ASCII Applicability (Revision FIPS 1 and 7)	1982
Coding of Character Sets for OCR and MICR	1983
Code Extension Techniques in 7 or 8 Bits (FIPS 35 Revision)	1984
Coded Character Sets for Text Communications	1985

DATABASE MANAGEMENT

Existing Standards and Guidelines		Dates of Issuance
FIPS PUB 76	Data Dictionary Guideline	1980 July 1
FIPS PUB 77	Applications Management Guideline	1980 September 1
FIPS PUB 79	Magnetic Tape Label and File Structure Standard	1980 August 5

Needed Standards and Guidelines	[redacted] GIB (Fiscal Year)
Audit and Control in Database Administration Guideline	1981
Data Translation Standard	1982
Data Dictionary Standard	1983
Performance Management Guideline	1984
DBMS Software Family Standards	1985

COMPUTER SECURITY AND RISK MANAGEMENT

Existing Standards and Guidelines		Dates of Issuance
FIPS PUB 31	Guidelines for Automatic Data Processing Physical Security and Risk Management	1974 June
FIPS PUB 39	Glossary for Computer Systems Security	1976 February 15
FIPS PUB 41	Computer Security Guidelines for Implementing Privacy Act of 1974	1975 May
FIPS PUB 46	Data Encryption Standard	1977 January 15
FIPS PUB 48	Guidelines for the Evaluation of Techniques for Automated Personal Identification	1977 April 1
FIPS PUB 65	Guideline for Automatic Data Processing Risk Analysis	1979 August 1
FIPS PUB 73	Guideline for Security of Computer Applications	1980 June 30
FIPS PUB 81	Encrypted Data Communications Protocols/Modes of Operation Standard	1980 October 30
FIPS PUB 83	Guideline on Network Access Control	1980 September 29

Needed Standards and Guidelines		(Fiscal Year)
ILLEGIB	[redacted]	1981
	Guideline on Computer Security Audit for Federal Managers	1981
	Guideline on Computer Security Audit for the EDP Auditor	1982
	Risk Analysis Standard	1982
	Contingency Planning Standard	1982
	Guideline on Security Certification	1982
	Guideline for Developing a Computer Security Program	1982
	User Authorization Standard	1983

[redacted] ILLEGIB

Integrating Encryption into Multi-Computer Systems	1983
Personal Identification Device Standard	1983
Guideline for Determining Security Requirements	1983
Guideline on Physical Security	1983
Guideline on Fundamental Security Requirements of Operating Systems	1984
Guideline on Security Variance Detection	1984
Trusted Software Standards	1985

SYSTEM SELECTION AND EVALUATION

Existing Standards and Guidelines		Dates of Issuance
FIPS PUB 42-1	Guidelines for Benchmarking ADP Systems in the Competitive Procurement Environment	1977 May 15
FIPS PUB 49	Guidelines on Computer Performance Management: An Introduction	1977 May 1
FIPS PUB 75	Guideline on Constructing Computer System Benchmarks	1980 September 18

Needed Standards and Guidelines	(Fiscal Year)
Guidelines on Establishing, Measuring, and Controlling User Services	1982
Guideline on Forecasting Workload and Service	1982
Guideline on Workload Management	1982
Guideline on Establishing, Measuring, and Controlling Resource Utilization Levels	1982
Guideline on Cost Accounting and Chargeback	1982
Standards Performance Measures	1983
Guideline on Acquiring Computer Services	1983
Guideline on Measuring and Controlling System Reliabilty	1983
Guideline on Estimating Computer System Capacity	1983
Common Benchmark Library	1984
Guideline on Monitoring the Performance and Costs of Acquired Computer Services	1984
Guideline on Conducting Installation Performance Audits	1984
Guideline on Evaluating System Alternatives	1984

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DATA ELEMENTS AND REPRESENTATIONS

Existing Standards and Guidelines

		Dates of Issuance
FIPS PUB 4	Calendar Date	1968 November 1
FIPS PUB 5-1	States and Outlying Areas of the U.S.	1970 June 15
FIPS PUB 6-3	Counties and County Equivalents of the States of the U.S.	1980 December
FIPS PUB 8-4	Standard Metropolitan Statistical Areas (SMSA's)	1974 June 30
FIPS PUB 9	Congressional Districts of the U.S. of Special Sovereignty	1977 March 1
FIPS PUB 10-3/ LC 1067-1	Codes for Countries of the World	1977 July
FIPS PUB 19	Guidelines for Registering Data Codes	1972 February 1
FIPS PUB 28	Standardization of Data Elements and Representations	1973 December 5
FIPS PUB 45	Guide for the Development, Implementation and Maintenance of Standards for the Representation of Computer Processed Data Elements	1976 September 30
FIPS PUB 55	Codes for Cities, Towns and Places	1978 June 1
FIPS PUB 58	Representation of Local Clock Time	1979 February 1
FIPS PUB 59	Representation of Universal Time and Zones	1979 February 1
FIPS PUB 66	Standard Industrial Classification (SIC) Codes	1979 August
FIPS PUB 70	Geographic Point Locations	1980 October 5

Needed Standards and Guidelines

	Planned Completion Date (Fiscal Year)
Foreign Countries and Their Subdivisions	1981
Identification of Federal and Related Organizations	1981

Standard Occupational Classification Codes	1981
Water Bodies of the World	1982
Alphanumeric Sequencing of Georgraphic Names	1982
Named Populated Places in the States of the U.S. and D.C.	1982
Products and Services in Federal Procurement	1983
FIPS PUB 8-5 (Revision) SMSA's	1983
Codes for Research Activities (Fields of Research)	1983
Population Group Designation	1983
Educational Level	1984
Named Populated Places in the United States (all U.S. territory), Canada and Mexico, addition of SMSA and Congressional District	1984
Earth Science Program Standards	1984
Transportation Program Standards	1985

Appendix 4
Description of Standards and Guidelines Under Development

HIGH LEVEL PROGRAMMING LANGUAGE

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Language Planning

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

Provide effective planning for a family of standard higher level languages that promote Federal ADP effectiveness.

4. Associated Voluntary Standards Efforts

X3J-series
X3H-series

5. Associated Federal Standards

FIPS 21-1
FIPS 29
FIPS 68
FIPS 69

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Cobol

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

Provide a Federal standard higher level language for increased effectiveness through program portability.

Higher level languages are important because they promote higher programmer productivity, ease conversion to other systems, encourage transportability of both programs and programming skills, support modifications with less effort, and enhance documentation and program testing. The Cobol standard provides increased effectiveness in business and data base computations. There is a large volume of Cobol code in the Federal inventory.

4. Associated Voluntary Standards Efforts

ANSI X3J4

5. Associated Federal Standards

Data Base Management Standards

FIPS 21-1

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Pascal

2. Responsible Group/Individual

Programming Science Division/Selden L. Stewart

3. Objectives and Benefits

Increased programmer efficiency through Pascal, a higher level language for information processing applications, providing more powerful and more rigorous structures than the established Federal standard languagues. Higher level languages are important because they promote higher programmer productivity, ease conversion to other systems, encourage transportability of both programs and programming skills, support modifications with less effort, and enhance documentation and program testing. The Pascal standard aims at augmenting the Federal repertory of programming languages with a very modern, general purpose higher level language.

4. Associated Voluntary Standards Efforts

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Basic

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

Provide a Federal standard higher level language for increased effectiveness through program portability.

Higher level languages are important because they promote higher programmer productivity, ease conversion to other systems, encourage transportability of both programs and programming skills, support modifications with less effort, and enhance documentation and program testing. The Basic standard aims at providing a conversational interactive programming language that will promote common language features available across a broad spectrum of systems and be accessible to the novice user with important computations. It includes graphics, real-time and editing modules.

4. Associated Voluntary Standards Efforts

ANSI X3J2

5. Associated Federal Standards

FIPS-68

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Fortran

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

Provide a Federal standard higher level language for increased effectiveness through program portability.

Higher level languages are important because they promote higher programmer productivity, ease conversion to other systems, encourage transportability of both programs and programming skills, support modifications with less effort, and enhance documentation and program testing. The Fortran standard provides increased effectiveness in numerical and scientific computations. A large volume of Fortran code is currently in use by Federal agencies.

4. Associated Voluntary Standards Efforts

ANSI X3J3

5. Associated Federal Standards

FIPS-69

6. Additional Information

SOFTWARE QUALITY

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Software Development Tools and Aids

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

To address the role of automated tools in software quality assurance through analysis and evaluation of existing tools, and to investigate the role of automated tools and aids in the support of high level language standards.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Validation, Verification, and Testing Guidelines
Fortran Analyzer
Software Conversion Guidelines

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Validation, Verification, and Testing Guidelines

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

To provide technical guidelines in the areas of validation, verification, and testing in order to aid in the management, production, and procurement of high quality software in Federal government.

4. Associated Voluntary Standards Efforts

IEEE Computer Society Technical Committee on Software Engineering Standards - Test Documentation, Quality Assurance Plan

5. Associated Federal Standards

Software Conversion
Software Documentation
Software Development Tools and Aids

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Conversion/Portability

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

To improve the quality and decrease the cost of software produced by conversion and to increase the portability of newly developed software.

4. Associated Voluntary Standards Efforts

IEEE Computer Society Technical Committee on Software Engineering Standards - Quality Assurance Plan, Test Documentation, Requirements Specifications.

5. Associated Federal Standards

Verification and Validation Guidelines
Software Development Tools and Aids
Software Documentation Guidelines

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Software Documentation Guidelines

2. Responsible Group/Individual

Programming Science Division/S. Stewart

3. Objectives and Benefits

To provide technical guidelines in the area of software documentation in order to aid in the management, production, and procurement of high quality software in the Federal government.

4. Associated Voluntary Standards Efforts

IEEE Computer Society Technical Committee on Software Engineering Standards - Test Documentation Plan, Quality Assurance Plan, Terminology.

5. Associated Federal Standards

Software Conversion Guidelines
Software Summary
Software Development Tools and Aids

6. Additional Information

COMPUTER SYSTEM AND NETWORK INTERFACE

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Operational Specification for Fixed Block Rotating Mass Storage Subsystems

2. Responsible Group/Individual

System Components Division/W. Burr

3. Objectives and Benefits

This standard defines the peripheral device dependent operational interface specifications for connecting fixed block magnetic disk equipment as part of ADP systems via the I/O channel interface. This standard together with the I/O channel interface standard and the channel level power control interface standard provides full plug-to-plug interchangeability for rotating mass storage subsystems. This set of standards will enable the competitive acquisition of computer system components from separate, independent sources as well as the improved reutilization of system components in the Federal inventory.

4. Associated Voluntary Standards Efforts

ANSI X3T9

5. Associated Federal Standards

I/O Channel Interface (FIPS PUB 60)
Power Control Interface (FIPS PUB 61)
Operational Specifications for Magnetic Tape Subsystems (FIPS PUB 62)
Operational Specifications for Rotating Mass Storage Subsystems (FIPS PUB 63)

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Operational Specifications for High Capacity Disk

2. Responsible Group/Individual

System Components Division/W. Burr

3. Objectives and Benefits

This standard defines the peripheral device dependent operational interface specifications for connecting high capacity magnetic disk equipment as part of ADP systems via the I/O channel interface. This standard together with the I/O channel interface standard and the channel level power control interface standard provides full plug-to-plug interchangeability for rotating mass storage subsystems. This set of standards will enable the competitive acquisition of computer sytem components from separate, independent sources as well as the improved reutilization of system components in the Federal inventory.

4. Associated Voluntary Standards Efforts

ANSI X3T9

5. Associated Federal Standards

I/O Channel Interface (FIPS PUB 60)
Power Control Interface (FIPS PUB 61)
Operational Specifications for Magnetic Tape Subsystems (FIPS PUB 62)
Operational Specifications for Rotating Mass Storage Subsystems (FIPS PUB 63)
Operational Specifications for Fixed Block Rotating Mass Storage Subsystems (FIPS PUB XX)

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

High Speed Channel Interface

2. Responsible Group/Individual

System Components Division/W. Burr

3. Objectives and Benefits

This standard will define the I/O channel level to peripheral controller or an equivalent interface that will replace or supplement the initial I/O channel level standard for future systems and computer architectures. Like the initial I/O channel interface standards, this standard will enable the competitive acquisition of computer system components from separate, independent sources as well as the improved reutilization of system components in the Federal inventory.

4. Associated Voluntary Standards Efforts

At NBS instigation, ANSI Technical Committee X3T9 is in the process of organizing a Subcommittee, X3T9.5, to work on a high speed local distributed data interface.

5. Associated Federal Standards

I/O Channel Interface (FIPS PUB 60)

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Minicomputer Device Interface (Storage Module Disk)

2. Responsible Group/Individual

System Components Division/W. Burr

3. Objectives and Benefits

This standard will define the controller to disk drive interface and will provide plug-to-plug interchangeability for disk drives. This standard will permit the competitive acquisition of disk drives from independent sources as well as improved reutilization of disk drives in the Federal inventory.

4. Associated Voluntary Standards Efforts

Draft Proposed ANSI Standard for Storage Module Interfaces X3T93/036 Revision 9 forwarded by X3T9 to X3 for further processing.

5. Associated Federal Standards

None

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Minicomputer Bus Interface

2. Responsible Group/Individual

System Components Division/G. Clark

3. Objectives and Benefits

This standard will define the minicomputer-to-device controller interface (corresponding to the I/O channel interface for large computers). This standard will provide plug-to-plug interchangeability for minicomputer peripherals at the I/O controller level, enabling competitive acquisition of peripheral components as well as improved reutilization of components with Federal inventory.

4. Associated Voluntary Standards Efforts

ANSI X3T9
ISO/TC97/SC13

5. Associated Federal Standards

None

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Microcomputer Interface

2. Responsible Group/Individual

System Components Division/D. Grubb

3. Objectives and Benefits

To provide Federal agencies with a standard governing the interface to minicomputers, thereby enabling microcomputers and associated components to be procured in a fully competitive manner and assuring operability of systems and the accurate exchange of data across interfaces.

4. Associated Voluntary Standards Efforts

IEEE Microprocessor Standards Committee
IEEE P896 Microcomputer Future Backplan Bus Standard Committee

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Terminal Communications Interface

2. Responsible Group/Individual

System Components Division/E. Scace

3. Objectives and Benefits

This standard will describe the cable, connectors, and signaling method to be employed in digital communications between a data terminal equipment (DTE) and data circuit-terminating equipment (DCE). All data terminal equipments (DTE) which operate in accordance with this standard will be able to exchange information through control, and receive status from all data circuit-terminating equipments (DCE) which operate in accordance with this standard, provided other conditions are met. This standard will enable competitive acquisition of DTE's and DCE's from separate, independent sources as well as improved reutilization of these equipments within the Federal inventory.

4. Associated Voluntary Standards Efforts

EIA RS-422A, Electrical Characteristics of Balanced Voltage Digital Interface Circuits
EIA RS-423A, Electrical Characteristics of Unbalanced Voltage Digital Interface Circuits
EIA RS-449, General Purpose 37-Position and 9-Position Interface for Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange

5. Associated Federal Standards

Fed. Std. 1020, Telecommunications: Electrical Characteristics of Balanced Voltage Digital Interface Circuits
Fed. Std. 1030, Telecommunications: Electrical Characteristics of Unbalanced Voltage Digital Interface Circuits
Fed. Std. 1031, Telecommunications: General Purpose 37-Position and 9-Position Interface for Data Terminal Equipment Employing Serial Binary Data Interchange

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Host Computer Interface

2. Responsible Group/Individual

System Components Division/E. Scace

3. Objectives and Benefits

This standard will describe the procedures and formats to be used when computers or terminal establish a connection to a packet switching communications network, and transmit and receive information over this connection. This standard will allow competitive purchase from separate, independent sources of packet switching communications services, and computers and terminals using these services. This standard will also improve reutilization of this equipment within the Federal inventory.

4. Associated Voluntary Standards Efforts

Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating with Packet Mode on Public Data Networks - CCITT Recommendation X.25.

5. Associated Federal Standards

Co-ordinated effort, schedule, & publication planned with the National Communication Service (NCS).

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Data Communications System Performance Parameters

2. Responsible Group/Individual

System Components Division/R. Moore, D. Grubb

3. Objectives and Benefits

The objective of this standard is to provide a set of user oriented, system independent, parameters to characterize the performance of data communications systems or services.

4. Associated Voluntary Standards Efforts

ANSI X3S3.5

5. Associated Federal Standards

The standard is expected to replace interim Federal Standard 1033.

6. Additional Information

Other related standards are ANSI X3.44-1974 and ANSI X3.79-1979.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Revised Bit-Oriented Data Link Control

2. Responsible Group/Individual

System Components Division/E. Scace

3. Objectives and Benefits

This standard will describe protocols for communications circuits using synchronous signaling methods. The protocols include: transmitting and receiving information; detecting transmission errors in received information and recovering from those errors; halting and starting the flow of information. All equipment operating in accordance with this standard can transmit and receive error-free information with other conforming equipment provided other conditions are met. This standard will allow competitive purchase of computer equipment from separate, independent sources as well as improve reutilization of this equipment within the Federal inventory.

4. Associated Voluntary Standards Efforts

ANSI X.366-1979, Advanced Data Communication Control Procedures (ADCCP)
ISO IS 3309, Data Communications - High Level Data Link Control -- Frame Structure
ISO IS 4335, Data Communications - High Level Data Link Control -- Elements of Procedure, Independent Numbering

5. Associated Federal Standards

Fed. Std. 1003, Telecommunications: Synchronous Bit-Oriented Data Link Control Procedures (Advanced Data Communications Control Procedures)

6. Additional Information

The need for a FIPS Guideline advising Federal agencies of application considerations and constraints recommended to ensure compatibility within the Federal community has been recognized. This is presently under development.

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Data Communications System Measurement Methodology

2. Responsible Group/Individual

System Components Division/D. Grubb, R. Moore

3. Objectives and Benefits

The objective of this standard is to prescribe methods for determining values for the set of user oriented, system independent, parameters that characterize the performance of data communications systems or services.

4. Associated Voluntary Standards Efforts

This standard will be developed by ANSI X3S3.5

5. Associated Federal Standards

This standard is expected to be adopted as a Federal Standard.

6. Additional Information

Other related standards are ANSI X3.44-1974 and ANSI X3.79-1979

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Transport Control Protocol

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

The Transport Control Protocol Standard is one of a set of high-level computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. It will enable the Government to select such components based upon performance and cost, and be assured that they will work correctly when interconnected. This protocol will define end-to-end mechanism for reliable transfer of information in a heterogeneous network.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization
Consultative Committee for International Telegraph and Telephone

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Session Control Protocol

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

The Network Session Control Protocol Standard is one of a set of high-level computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. It will enable the Government to select such components based upon performance and cost, and be assured that they will work correctly when interconnected. This protocol will define end-to-end mechanism for reliable transfer of information in a heterogeneous network.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization
Consultative Committee for International Telegraph and Telephone

5. Associated Federal Standards

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

File Transfer Protocol

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

This is one of a set of high-level, computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. It will enable the Government to select such components based upon performance and cost, and be assured that they will work correctly when interconnected. This protocol defines the data transformations and file access operations necessary to support file transfer in a heterogeneous computer network.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Network Virtual Terminal

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

This is one of a set of high-level, computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. It will enable the Government to select such components based upon performance and cost, and be assured that they will work correctly when interconnected. This protocol defines the data transformation and device handling aspects of terminals used in a heterogeneous computer network.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Common Command Language

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

This is one of a set of high-level, computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. It will enable the Government to select such components based upon performance and cost; and be assured that they will work correctly when interconnected. This protocol defines a common set of file access and manipulation operations that support file transfer and remote job entry in heterogeneous networks.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization

5. Associated Federal Standards

Remote Job Entry

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Remote Job Entry

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

This is one of a set of high-level, computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. It will enable the Government to select such components based upon performance and cost, and be assured that they will work correctly when interconnected. This protocol defines a common set of procedures for remote job processing in a heterogeneous computer network.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization

5. Associated Federal Standards

Common Command Language

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Network Interconnection

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

This is one of a set of high-level, computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. It will enable the Government to select such components based upon performance and cost, and be assured that they will work correctly when interconnected. This standard is a protocol for interconnection of separate local or geographically dispersed Federal computer networks.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization

5. Associated Federal Standards

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Network Interprocess Communication

2. Responsible Group/Individual

Systems and Network Architecture Division/John Heafner

3. Objectives and Benefits

This is one of a set of high-level, computer network protocol standards. It will make possible the interconnection of competitively procured network components such as computers and terminals. They will enable the Government to select such components based upon performance and cost, and be assured that they will work correctly when interconnected. This protocol defines the communication support necessary between cooperating processes on a heterogeneous computer network.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Organization for Standardization

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Network Distributed Data Management

2. Responsible Group/Individual

Systems and Network Architecture Division/S. R. Kimbleton

3. Objectives and Benefits

This is one of a set of high level protocol standards for computer networks that will make possible the interconnection of competitively procured network components, such as host computers and intelligent terminals. This will enable the Federal Government to pick and choose such components based on performance and cost, and be assured they will work correctly when connected together. This standard is a protocol that provides a uniform means for users to interact with heterogeneous database management systems in a computer network.

4. Associated Voluntary Standards Efforts

American National Standards Institute
International Standard Organization

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Message Interchange Format

2. Responsible Group/Individual

Systems and Network Architecture Division/S. Watkins

3. Objectives and Benefits

The objective of this standard is to permit the exchange of messages in automated form between dissimilar computer-based message systems and services by providing a logical interface between them. Such a standard will greatly increase the utility of computer-based message systems to all users by vastly increasing the range of possible originators/recipients; will reduce the cost of interconnection by eliminating the need for multiple different translation devices between systems; and will permit computer-based message systems and services to be produced more competitively.

4. Associated Voluntary Standards Efforts

IFIP WG 6.5

5. Associated Federal Standards

6. Additional Information

This standard will not address the format of the content of the messages. Only header information such as source and destination address, subject, date and similar items will be specified in this standard.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Selection Criteria for Local Networking Technology

2. Responsible Group/Individual

Systems & Network Architecture Division

3. Objectives and Benefits

This Guideline will contain the feature analysis of the latest technology for local area networking and the methodology for performing requirements analyses including a mechanism for relating requirements to technological features. This will assist agencies in selecting the most cost effective local area networking technology.

4. Associated Voluntary Standards Efforts

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Flexible Disk File Format

2. Responsible Group/Individual

Systems and Network Architecture Division/S. Watkins

3. Objectives and Benefits

This standard will provide for the interchange of automated files of data on flexible magnetic disks between computer-based office information systems and as such will serve as an interface between different computer-based office information systems. The standard will eliminate the need for costly format conversion equipment currently required to exchange data on magnetic media between such systems, and will permit storage subsystems for such systems to be procured more competitively.

4. Associated Voluntary Standards Efforts

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Text Editing Directives

2. Responsible Group/Individual

Systems and Network Architecture Division/S. Watkins

3. Objectives and Benefits

This standard will provide a common user interface for all text editing operations commonly performed with computer-based office information systems. Such standardization will significantly reduce training and operations costs for these systems, and will permit systems to be procured on a more competitive basis.

4. Associated Voluntary Standards Efforts

ANSI X3J6

5. Associated Federal Standards

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Device Connection Standard for Local Area Networking

2. Responsible Group/Individual

Systems and Network Architecture Division/R. Rosenthal

3. Objectives and Benefits

This standard will provide a uniform interface to local area computer networks that will enable such networks and their interface units to be procured on a fully competitive basis, and will enable a wide range of terminal equipment to be connected to such networks in a common way.

4. Associated Voluntary Standards Efforts

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Message System Protocol

2. Responsible Group/Individual

Systems & Network Architecture Division

3. Objectives and Benefits

This standard will provide a uniform mechanism for exchanging messages among users of computer base message systems. This standard makes use of the other protocol standards being developed within the networking program with the exchange of computer based information.

4. Associated Voluntary Standards Efforts

5. Associated Federal Standards

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Message Processing Directives

2. Responsible Group/Individual

Systems and Network Architecture Division/S. Watkins

3. Objectives and Benefits

This standard will provide a common user interface for all message processing operations commonly performed with computer-based message systems. Such standardization will significantly reduce training and operation costs for such systems, and will permit systems to be procured on a more competitive basis.

4. Associated Voluntary Standards Efforts

IFIP Wg 6.5

5. Associated Federal Standards

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Text Formatting Directives

2. Responsible Group/Individual

Systems and Network Architecture Division/S. Watkins

3. Objectives and Benefits

This standard will provide a common user interface for all text formatting operations commonly performed with computer-based office information systems. Such standardization will significantly reduce training and operations costs for such systems, and will permit systems to be procured on a more competitive basis.

4. Associated Voluntary Standards Efforts

ANSI X3J6

5. Associated Federal Standards

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Data Input/Output Standard

2. Responsible Group/Individual

System Components Division/ D. S. Pallett

3. Objectives and Benefits

To provide information that will lead to more economic and efficient utilization of data entry and output components of systems.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

FIPS 67 - Guideline on Selection of Data Entry Equipment was published in FY 1979.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Recorded Magnetic Cassette Standard

2. Responsible Group/Individual

System Components Division/S. Geller

3. Objectives and Benefits

This standard, together with related standards defining the physical and magnetic characteristics of the magnetic tape cassette, will specify the encoding conventions and format necessary to ensure data interchange for this form of media. This standard, with the associated Standard Reference Material (SRM 1600), will provide compatibility among tape cassettes and related recording and reproducing equipment obtained from independent sources of supply.

4. Associated Voluntary Standards Efforts

ANSI X3B5, Cassettes and Cartridges

5. Associated Federal Standards

FIPS 1, Federal Standard Code for Information Interchange (ASCII)
FIPS 7, Implementation of the Code for Information Interchange and Related Media Standards
FIPS 35, Code Extension Techniques in 7 or 8 bits (ASCII)
FIPS 51, Magnetic Tape Cassettes for Information Interchange

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Recorded Magnetic Flexible Disk Cartridge
for Information Interchange

2. Responsible Group/Individual

System Components Division/S. Geller

3. Objectives and Benefits

This standard, together with related standards defining the physical and magnetic characteristics of the magnetic flexible disk cartridge, will specify the encoding conventions and format necessary to ensure data interchange for this form of media. This standard, with the associate Standard Reference Material (SRM 3210), will provide compatibility among flexible disks and related recording and reproducing equipment obtained from independent sources of supply.

4. Associated Voluntary Standards Efforts

ANSI X3B8, Flexible Disk

5. Associated Federal Standards

FIPS 1, Code for Information Interchange (ASCII)
FIPS 7, Implementation of the Code for Information Interchange and Related Media Standards
FIPS 35, Code Extension Techniques in 7 or 8 Bits (ASCII)

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Recorded Magnetic Tape Minicassette Standard

2. Responsible Group/Individual

- System Components Division/S. Geller

3. Objectives and Benefits

This standard, together with related standards defining the physical and magnetic characteristics of the magnetic tape minicassette, will specify the encoding conventions and format necessary to ensure data interchange for this form of media. This standard, with the associate Standard Reference Material, will provide compatibility among minicassettes and related recording and reproducing equipment obtained from independent sources of supply.

4. Associated Voluntary Standards Efforts

ANSI X3B5, Cassettes and Cartridges

5. Associated Federal Standards

FIPS 1,-Federal Standard Code for Information Interchange (ASCII)
FIPS 7, Implementation of the Code for Information Interchange and Related Media Standards
FIPS 35, Code Extension Techniques in 7 and 8 Bits (ASCII)

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Self Loading Computer Tape Cartridge Mechanical (Functional) Specification

2. Responsible Group/Individual

System Components Division/S. Geller

3. Objectives and Benefits

This standard provides the information necessary to allow for physical interchange of a self-loading cartridge when used with half inch wide magnetic computer tape as described in GSA Interim Purchase Specification WT-0051C. This standard will provide for compatibility, at acceptable performance levels, among reels of magnetic computer tape, computer tape handlers, and self-loading cartridges obtained from independent sources of supply.

4. Associated Voluntary Standards Efforts

ANSI X3B1, Computer Tape

5. Associated Federal Standards

FIPS 1, Federal Standard Code for Information Interchange (ASCII)
FIPS 7, Implementation of the Code for Information Interchange and Related Media Standards
FIPS 35, Code Extension Techniques in 7 or 8 bits (ASCII)
FIPS 3-1, Recorded Magnetic Tape for Information Interchange (800 CPI, NRZI)
FIPS 25, Recorded Magnetic Tape for Information Interchange (1600 CPI, PE)
FIPS 50, Recorded Magnetic Tape for Information Interchange, 6250 cpi (246 cpmm), Group Coded Recording

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Handling of Computer Magnetic Storage Media

2. Responsible Group/Individual

System Components Division/S. Geller

3. Objectives and Benefits

These guidelines are a basic reference document to inform Federal agencies of current approaches to the care and handling procedures which should be followed to assure successful preparation, storage, and recall of data which are stored on magnetic computer storage media. These guidelines are oriented towards the managers of ADP installations which incorporate large computer magnetic tape libraries. Their objective is to improve the operational reliability of these media and to reduce the potential for costly data losses in Federal ADP systems.

4. Associated Voluntary Standards Efforts

ANSI X3B1, Computer Tape
ISO/TC97/SC11, Flexible Magnetic Media for Digital Interchange
Tape Head Interface Committee (THIC), Magnetic Media
ECMA TC17, Magnetic Tapes

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Very High Density Recorded Magnetic Tape Standard

2. Responsible Group/Individual

System Components Division/S. Geller

3. Objectives and Benefits

This standard, together with related standards defining the physical and magnetic characteristics of the very high density magnetic tape, will specify the encoding conventions and format necessary to ensure data interchange for this form of media. This standard, with the associate Standard Reference Material, will provide compatibility among very high density magnetic tapes and related recording and reproducing equipment obtained from independent sources of supply.

4. Associated Voluntary Standards Efforts

ANSI X3B1, Computer Tape (no existing efforts in FY 81)

5. Associated Federal Standards

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Character Sets for OCR (FIPS PUB 32 Revision)

2. Responsible Group/Individual

System Components Division/T. Bagg

3. Objectives and Benefits

The objective is to establish a standard that ensures a compatible range of reflectiveness for read and non-read inks used for OCR. Such a standard enhances reading accuracy and eliminates the necessity of determining and subsequently writing a specification for inks that are suitable for printing forms and imprinting the data to be read automatically.

4. Associated Voluntary Standards Efforts

Guideline for OCR Print Quality being developed by ANSI X3A1.

5. Associated Federal Standards

Guideline for OCR Print Quality (being developed).

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

OCR Character Positioning Standard

2. Responsible Group/Individual

System Components Diyision/T. Bagg

3. Objectives and Benefits

The objective is to establish the nominal position with allowable tolerance of OCR characters in relation to their location to other machine readable characters or sensed marks and to the document edges. The benefits result in the accurate reading of data for computer input by automatic means. Properly installed OCR systems will increase data input accuracy at speeds up to ten times faster and keystroking.

4. Associated Voluntary Standards Efforts

Proposed ANSI Standard BSR X3.93M-1980, Optical Character Recognition (OCR) Character Positioning
Proposed ANSI revised standard BSR X3.17-1980, Character Set for Optical Character Recognition (OCR-A)
ANSI Standard X3.49-1975, Character Set for Optical Character Recognition (OCR-B)
ANSI Standard X3.86-1980, Optical Character Recognition (OCR) Inks
Proposed ANSI Guideline for OCR Print Quality

5. Associated Federal Standards

FIPS 32, Character Sets for OCR
FIPS 40, Guideline for Optical Character Recognition Forms
FIPS 85, Optical Character Recognition (OCR) Inks
Proposed FIPS Guideline for OCR Print Quality

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline for OCR Print Quality

2. Responsible Group/Individual

System Components Division/T. Bagg

3. Objectives and Benefits

The objective is to establish minimum values of print quality of OCR characters and methods of measuring these values. The benefits result in accurate reading of data for computer input by automatic means. Characters with properly printed shapes and adequate contrast between the paper and ink can be read automatically up to ten times faster and more accurately than when keystroked.

4. Associated Voluntary Standards Efforts

Proposed ANSI Standard BSR X3.93M-1980, Optical Character Recognition (OCR) Character Positioning
Proposed ANSI revised standard BSR X3.17-1980, Character Set for Optical Character Recognition (OCR-A)
ANSI Standard X3.49-1975, Character Set for Optical Character Recognition (OCR-B)
ANSI Standard X3.86-1980, Optical Character Recognition (OCR) Inks
Proposed ANSI Guideline for OCR Print Quality

5. Associated Federal Standards

FIPS 32, Character Sets for OCR
FIPS 40, Guideline for Optical Character Recognition Forms
FIPS 85, Optical Character Recognition (OCR) Inks
Proposed FIPS for Optical Character Recognition (OCR) Character Positioning

6. Additional Information

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

MICR Read Optically Standard

2. Responsible Group/Individual

System Components Division/T. Bagg

3. Objectives and Benefits

The objective is to provide guidance for Government agencies who must read MICR optically to reduce the amount of manual keyboarding for characters not recognized by magnetic reading devices. Optical Character Recognition (OCR) techniques have the ability to more accurately recognize characters as a significant low level of perfection than magnetic readers. Significant savings will accrue by greatly reducing human intervention.

4. Associated Voluntary Standards Efforts

Print Specifications for Magnetic Ink Character Recognition (MICR), ANSI X3.2

5. Associated Federal Standards

Character Sets for Optical Character Recognition, FIPS PUB 32

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Hand Print Character Set (FIPS 33 Revision)

2. Responsible Group/Individual

System Components Division/T. Bagg

3. Objectives and Benefits

The objective is to maintain a standard that ensures accurate reading of handprinted data automatically for computer processing. The benefits result in savings by not requiring the keystroking of such data.

4. Associated Voluntary Standards Efforts

ANSI X3.45, Character Set for Handprinting
Proposed ANSI Standard, Guideline for OCR Print Quality

5. Associated Federal Standards

FIPS 40, Guideline for Optical Character Recognition Forms
Proposed FIPS Guideline for OCR Print Quality

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Graphic Representation of ASCII Controls (FIPS PUB 36 Revision)

2. Responsible Group/Individual

System Components Division/J. Little

3. Objectives and Benefits

This standard specifies graphical representation for the 34 characters of ASCII (American Standard Code for Information Interchange) FIPS 1-1) for which graphical representation is not indicated in FIPS 1-1. Use of this standard in displays and printers will facilitate the interchange of ADP data and programs which contain control characters that are normally non-printing.

4. Associated Voluntary Standards Efforts

ANSI X3.32-1973, Graphic Representation of the Control Characters of ASCII
ISO 2047-1975, Graphical Representation for the Control Characters of the 7-Bit Coded Character Set

5. Associated Federal Standards

FIPS 1-1, Code for Information Interchange (ASCII)

6. Additional Information

ANSI X3.32-1973 and ISO 2047-1975 are currently being revised to eliminate a few conflicts with other ISO standards. It is expected that the revision of ISO 2047 will be adopted as ANSI X3.32 and in turn as FIPS PUB 36-1.

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Subsets of ASCII (FIPS PUB 15 Revision)

2. Responsible Group/Individual

System Components Division/J. Little

3. Objectives and Benefits

These character subsets are intended to be used for all printers, display devices, punched card equipment, and other data processing or communication equipment in those systems or applications that do not require the full 128-character set contained in FIPS PUB 1-1. The use of the 64 or 16-character graphic subsets in lieu of the full set of 95 graphics, where appropriate, can result in advantageous combinations of increased speed of printing or display, decreased costs, decreased complexity, and efficient manipulation.

4. Associated Voluntary Standards Efforts

Graphic Subsets of ASCII developed and approved by ANSI Technical Committee X3L2 as document X3L2/78/86.

5. Associated Federal Standards

FIPS PUB 1-1, Code for Information Interchange (ASCII)

6. Additional Information

The anticipated ANSI standard in X3L2/78/86 has the same 16, 64, and 95 graphic character subsets as FIPS PUB 15 and also has a 49 character graphic subset. It is not certain whether the 49 character subset will be included in FIPS PUB 15-1.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

ASCII Applicability Revision (FIPS 1 and 7 Revision)

2. Responsible Group/Individual

System Components Division/J. Little

3. Objectives and Benefits

ASCII (FIPS PUB 1) is the coded character set to be used for the general interchange of information among processing systems, communication systems, and associated equipment. FIPS PUB 7 is the implementation instructions. FIPS PUB 1 was published in 1968, and FIPS PUB 7 in 1969. FIPS PUB 1-1 was published in 1980 but the applicability section was not revised. Revised applicability statements of FIPS PUBS 1-1, 7, 15, 35, and XX will be processed together during 1982 to provide greater consistency among them and other FIPS PUBS.

4. Associated Voluntary Standards Efforts

ANSI X3L2
ISO/TC97/SC2

5. Associated Federal Standards

FIPS PUB 35-1975/ANSI X3.41-1974 (code extension, 7 or 8 bits)
FIPS PUB XX, Additional Controls for Use with ASCII

6. Additional Information

The 1980 FIPS PUB 1-1 does not include the implementation instructions of FIPS PUB 7. The next revision of FIPS PUB 1-1 should encompass FIPS PUB 7 implementation instructions along with revised applicability statement.

Computer System and Network Interface Standards
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Coding of Character Sets for OCR and MICR

2. Responsible Group/Individual

System Components Division/J. Little

3. Objectives and Benefits

This standard will define the bit-coded representation of printed characters recognized optically or magnetically by reading equipment, permitting reading equipment and data produced by reading equipment to be interchanged and entered into computers in a standard manner.

4. Associated Voluntary Standards Efforts

ISO 2033-1972 and a pending revision expected in 1982.

5. Associated Federal Standards

FIPS PUB 1-1, Code for Information Interchange (ASCII)
FIPS PUB 32-1, OCR Character Sets

6. Additional Information

The existing ISO 2033-1972 and its proposed revision encompass coding for OCR-A, OCR-B, and MICR CMC-7 character sets, but not MICR E13B characters. CMC-7 is widely used on European bank checks. E13B, as specified in ANSI standards X3.2-1970 and X3.3-1970, is used on American bank checks. An attempt is being made by ANSI Technical Committee X3L2 to provide MICR and OCR coding in ISO 2033 that is compatible with ISO DP 6937, Coded Character Set for Text Communication.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Code Extension Techniques in 7 or 8 Bits (FIPS PUB 35 Revision)

2. Responsible Group/Individual

System Components Division/J. Little

3. Objectives and Benefits

This standard specifies methods of extending the 7-bit code of ASCII (American Standard Code for Information Interchange) (FIPS 1-1), in situations which require control functions and/or graphic symbols that are not included in the 128 characters of ASCII, ranging from one such additional character up to extensive families of control and graphic sets.

4. Associated Voluntary Standards Efforts

ANSI X3.4-1977, Standard Code for Information Interchange (ASCII)
ANSI X3.41-1974, Code Extension Techniques for Use with the 7-Bit Coded Character Set of ASCII
ISO 646-1973, 7-Bit Coded Character Set for Information Processing Interchange
ISO 2022-1973, Code Extension Techniques for Use with the ISO 7-Bit Coded Character Set
ISO 4873-1979, 8-Bit Coded Character Set for Information Interchange

5. Associated Federal Standards

FIPS PUB 1, Code for Information Interchange (ASCII)

6. Additional Information

FIPS PUB 35 (1975) indicated that NBS would maintain a registry of code extensions used by Federal agencies. This provision will be dropped in FIPS PUB 35-1, because extended codes for control functions and for graphic sets will be contained in anticipated future FIPS PUBS.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Coded Character Sets for Text Communications

2. Responsible Group/Individual

System Components Division/J. Little

3. Objectives and Benefits

This standard coded character set for text communication constitutes an extension of ISO 646 (the basis for ASCII, FIPS 1-1) and applies to the store-to-store communication of character-coded text in "page image format." It encompasses all Latin-based languages and is open-ended to accommodate the addition of more graphic characters, such as non-Latin alphabets, symbols needed in office systems and newspapers, etc.

4. Associated Voluntary Standards Efforts

ANSI X3L2 is contributing to ISO/TC97/SC2/WG4 which is developing ISO DP 6937.

5. Associated Federal Standards

FIPS PUB 1-1, Code for Information Interchange
FIPS PUB 35, Code Extension Techniques in 7 or 8 Bits

6. Additional Information

This standard will adopt ISO 6937, Coded Character Set for Text Communication, being developed by ISO/TC97/SC2/WG4 in cooperation with CCITT groups developing standards for Teletex, an 8-bit international communication code, and Videotex, a 7-bit international code for interactive television.

DATABASE MANAGEMENT

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Audit and Control in Database Administration

2. Responsible Group/Individual

Application Systems Division/Alan Goldfine

3. Objectives and Benefits

Objective: Provide data administrators and database administrators with state-of-the-art information for performing their prime tasks effectively.

Benefits: Reduction in risks of the U. S. Government in exposure to loss of information, confidentiality and fraud in operation of data bases and other information resources.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

This work is based exclusively on a contract to Mr. William Perry, a leading expert in this field.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Data Translation Standard

2. Responsible Group/Individual

Application Systems Division/D. Deutsch

3. Objectives and Benefits

Provide a data translation standard for file and database management environments. Provide Federal Government users a better understanding of the special problems involved in converting application systems containing a database management system.

Benefits competitive procurement and data transfer to support application portability and conversion. Reduces labor costs associated with transfer of data on magnetic tapes between dissimilar computing systems. Minimizes conversion and maintenance costs for application systems containing database management software.

4. Associated Voluntary Standards Efforts

ANSI X3L5 BSR X3.87 Draft Proposed American National Standard Specification for an Information Interchange Data Descriptive File.

5. Associated Federal Standards

FIPS 79: Magnetic Tape Labels and File Structure for Information Interchange.

6. Additional Information

Objectives are strongly dependent on contract effort by University of Michigan.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Data Dictionary Standard

2. Responsible Group/Individual

Application Systems Division/ Pat Konig

3. Objectives and Benefits

Objective: Develop a Federal standard for a data dictionary/directory system based on Federal requirements.
Benefit: Reduced risk of data inconsistencies and redundancies. Reduced data collection and dissemination load. Economy in database application systems design and maintenance.

4. Associated Voluntary Standards Efforts

Under ANSI Committee X3H4 - Information Resource Dictionary System

5. Associated Federal Standards

Ongoing work in database management system standards and in data elements and representations standards.

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Performance Management Guidelines

2. Responsible Group/Individual

Applications Systems Division/D. Fife

3. Objectives and Benefits

To assist Federal agencies in the effective application of innovative technology. To provide Federal ADP managers with tools and techniques for tuning and effectively utilizing database management systems, and for selecting from among existing or new database management approaches for advanced office automation and software management support systems. Benefits include improved capability to use new DBMS technology and to economically apply existing tools, and increased efficiency through the use of database management techniques in advanced administrative systems.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

Performance management guidelines will address the potential applicability of new technology and ADP performance innovations to Federal data management problems.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

DBMS Software Family Standard

2. Responsible Group/Individual

Application Systems Division/D. Deutsch

3. Objectives and Benefits

To develop guidelines and standards for assisting Federal agencies in specifying, evaluating, and applying data management systems. To establish an integrated and comprehensive family of database management system standards based on ANSI results. Benefits include increased portability for database management software and economically apply DBMS technology.

4. Associated Voluntary Standards Efforts

CODASYL: COBOL
DDLC-Data Description Language
FORTRAN Database

ANSI: X3H2 - Data Definition Language
X3J3 - FORTRAN
X3J4 - COBOL
X3/SPARC/DBSG - Database Study Group
X3/SPARC/OSI - Open System Interchange

ISO: TC97/SC5 - Programming Language
TC97/SC5/DEG - Data Definition Experts Group
TC97/SC5/WG3 - Database Management Systems

IFIP: TC 2.6 - Database Management

5. Associated Federal Standards

FIPS 21-2: COBOL Programming Language (revised)
FIPS 69: FORTRAN Programming Language

6. Additional Information

In addition to the traditional functions of database definition, data manipulation and query processing, Federal DBMS standards should address security and integrity features, utilities, design aids, and operating system interfaces.

COMPUTER SECURITY AND RISK MANAGEMENT

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Password Use Standard

2. Responsible Group/Individual

System Components Division/Dr. J.P. Riganati

3. Objectives and Benefits

To provide Federal agencies with a standard governing the selection, distribution, and use of passwords, which are currently the most widely employed method of controlling access to computer resources and computer network services. This will reduce the risk of misappropriation of these resources by unauthorized individuals and will safeguard the data contained in them.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Personal Identification Device Standard

Data Encryption Standard (FIPS PUB 46)

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Computer Security Audit for Federal Managers

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify a practical approach for performing computer security audits by the general auditor with some EDP responsibilities; to guide the general auditor on how to gather and determine the audit significance of audit evidence on computerized applications. Benefits include enabling the general Federal auditor to evaluate the adequacy and effectiveness of security controls over vulnerabilities and the identification of situations in which an EDP audit specialist is needed.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None.

6. Additional Information

The previously planned Guideline on Computer Security Audit (FY 81) has been separated into two guidelines to provide appropriate guidance to two different types of Federal auditors: the general auditor and the EDP specialist auditor.

An Executive Guide on Security Audit, which is intended for high-level Federal managers, has been added to the development plan.

Computer Security and Risk Management

Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Computer Security Audit for the EDP Auditor

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify a state-of-the-art approach for performing computer security audits by the EDP audit specialist; such audits would apply to applications, systems, and installations. Benefits include the evaluation of the adequacy and effectiveness of security controls over vulnerabilities and the identification of additional controls required to provide acceptable levels of security.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

The previously planned Guideline on Computer Security Audit (FY 81) has been separated into two guidelines to provide appropriate guidance to two different types of Federal auditors: the general auditor and the EDP audit specialist.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Risk Analysis Standard

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To identify mandatory elements and factors that must be present in risk analysis methodologies to be used by Federal agencies. Benefits include assurance of the reliability and validity of risk analysis results for those methodologies that meet the standard.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Contingency Planning Standard

6. Additional Information

An executive guide on risk analysis, which is intended for high-level managers, was added to the development plan.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Contingency Planning Standard

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify key areas for consideration in contingency planning, to provide specific criteria for agencies to use in determining the extent and degree of contingency planning, and to specify requirements for implementing and maintaining documented plans in a state of readiness. Benefits to be derived from this standard include assurance of the integrity of data processed by Federal agencies and of the continuity of critical functions of an agency's missions.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Risk Analysis Standard

6. Additional Information

An executive guide on contingency planning, which is intended for high-level managers, was added to the development plan.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Security Certification

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To provide guidance on methods for measuring the level of security of an application, system, and installation; to relate this information to guidance on certifying the security of an application, a system, and an installation. Benefits include enabling managers to determine conditions under which their security requirements are being met.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

The first phase in developing this guideline has been the performance of a technology assessment on methods for measuring the level of security of an application, a system, and an installation.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline for Developing a Computer Security Program

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To define a framework and identify steps agencies should take in planning and developing a computer security plan. This guideline will assist agencies in developing a cost-effective and comprehensive security program.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

User Authorization Standard

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify a set of access techniques for controlling access to, and use of, computer systems and networks, including physical security devices, secure programming techniques, hardware/software access controls, and personal identification systems. Benefits to be derived from this standard include reduced potential for fraud, improved personal accountability and improved data confidentiality and system availability.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

A major portion of this plan is supported by contracting. To date, the contractor has delivered a draft technology assessment report and a draft guideline. Additional contractor-developed deliverables include a standard impact analysis and applicability study and the development of the standard.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Encryption Integration Standard

2. Responsible Group/Individual

Operations Engineering Division/D. Branstad

3. Objectives and Benefits

To provide specifications for the integration of the Data Encryption Standard (DES) into multi-computer systems, including personal authentication of users, management of encryption keys, and compatible encryption of data communications and storage. Benefits include improved security for computer data during communication and in storage, reduced costs for the procurement and use of integrated encryption systems, and systems compatibility as implemented by different vendors.

4. Associated Voluntary Standards Efforts

The American National Standards Institute (ANSI) has a technical committee on Data Encryption (X3T1) which has proposed three standards development projects, and which parallel with the planned Federal Information Processing Standard.

5. Associated Federal Standards

Data Encryption Standard (FIPS PUB 46)

DES Modes of Operation Standard (FIPS PUB 81)

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Personal Identification Device Standard

2. Responsible Group/Individual

System Components Division/Dr. J.P. Riganati

3. Objectives and Benefits

To provide Federal agencies with a standard governing the evaluation, selection and use of personal identification techniques and devices in order to control access to computer resources and computer network services. This will reduce the risk of misappropriation of these resources by unauthorized individuals and will safeguard the data contained in them.

4. Associated Voluntary Standards Efforts

ASTM F-12 Security Systems and Equipment

5. Associated Federal Standards

Data Encryption Standard (FIPS PUB 46)

Password Use Standard

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline for Determining Security Requirements

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify procedures for translating legislative requirements (e.g., Privacy Act), OMB directives (e.g., A-71, TM-1), administrative requirements, and system requirements into specific security requirements that must be satisfied by a computer application, system or installation. This guideline will assist in defining security requirements that reduce vulnerabilities and risks to an acceptable level.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Physical Security

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To provide guidance to Federal agencies in analyzing their requirements for the protection of data and processing facilities from physical damage caused by vulnerabilities to events such as natural disasters, failure of supporting utilities, unauthorized access, water damage, and fire. Benefits to be derived include improved data integrity, system availability, data confidentiality and cost-effective selection of physical, software and hardware controls.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Fundamental Security Requirements of Operating Systems

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify the basic security functions and controls that operating systems should have, and to relate these functions and controls to the degree of security that operating systems can provide to computer applications. Benefits to be derived include improving agencies' ability to evaluate and select operating system architectures that best meet their security requirements and policy.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Security Variance Detection

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify procedures and controls that allow management to detect and react to activities that it has determined may constitute hazards and unacceptable risks. Benefits to be derived include improved detection of fraud, embezzlement and other misuse of the system and its data by authorized users of the system as well as detection of undesirable modification or disclosure of information that remains hidden from management review.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Trusted Software Standards

2. Responsible Group/Individual

Operations Engineering Division/S. Katzke

3. Objectives and Benefits

To specify the performance requirements of a secure operating system plus the administrative procedural and physical environments in which it has to be embedded. Additional objectives include identifying the procedures necessary to develop security kernels and to evaluate commercially available trusted software systems. Benefits include providing agencies the capability of higher degrees of protection for critical applications than would otherwise be possible with other techniques.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

None

6. Additional Information

This standard will be initiated when adequate technology and validation techniques for trusted operating systems has been developed through the DoD Computer Security Initiative Program.

SYSTEM SELECTION AND EVALUATION

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Establishing, Measuring, and Controlling User Service

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To provide agencies with best-practice guidance on techniques for insuring effective installation performance - i.e., that service to end users is properly established, measured, and controlled. Benefits include the increased effectiveness of Federal ADP installations.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 49 Guideline on Computer Performance Management: An Introduction

Standard Performance Measures

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Forecasting Workload and Service

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To establish best-practice guidance on procedures for forecasting future agency processing and service requirements. Benefits include more accurate agency workload forecasts, which result in more cost-effective acquisition and planning choices.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Guideline on Establishing, Measuring, and Controlling User Service

Guideline on Estimating Computer System Capacity

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Workload Management

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop a best-practice guideline on techniques useful to ADP managers for influencing or controlling the efficiency of the users' workload. Increases in total data center efficiency result from increasing the efficiency of the hardware and increasing the efficiency of the workload. Benefits derived from this guideline will allow the ADP manager to influence efficiencies in the latter, thereby increasing total data center efficiency.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 49 Guideline on Computer Performance Management: An Introduction

6. Additional Information

None

System Selection and Evaluation
Family of Standards

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Measuring and Controlling ADP Resources

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop a guideline for use by ADP installation managers describing best-practice techniques and procedures for measuring and controlling levels of resource usage. Benefits will include better control over ADP resources, thereby resulting in more cost-effective operations.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 49 Guideline on Computer Performance Management: An Introduction

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Cost Accounting and Chargeback

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop best-practice guidance for agencies to fully account for and recover costs for ADP resources. Benefits include more equitable charges to users, increased awareness of ADP-related costs, and the establishment of mechanisms for influencing user behavior.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Standard Performance Measures

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Standard Performance Measures

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To establish a minimal set of performance measurement capabilities on vendor systems acquired by Federal agencies. Benefits will include improved management and control of ADP resources, better service to end users, increased resource capacity and productivity, extended life of installed systems, and more responsive equipment procurements.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 49 Guideline on Computer Performance Management: An Introduction
Guideline on Establishing, Measuring, and Controlling User Service
Guideline on Cost Accounting and Chargeback
Guideline on Forecasting Workload and Service
Guideline on Estimating Computer System Capacity

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Acquiring Computer Services

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop best-practice guidance to agencies on techniques and procedures for selecting alternative sources of outside computer services. A study will first be conducted to determine the validity and limits of use of benchmarks in evaluating the processing costs of commercial service bureaus. Benefits include more cost-effective and timely acquisitions of commercial computer services.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 42-1 Guideline for Benchmarking ADP Systems in the Competitive Procurement Environment

Guideline on Monitoring the Performance and Costs of Acquired Computer Services

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Measuring and Controlling System Reliability

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop a guideline describing best-practice techniques for measuring and controlling total system reliability - i.e., the hardware and operating system. Benefits to the ADP manager include better control over total system reliability, which directly affects the degree of service provided to the users.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 49 Guideline on Computer Performance Management: An Introduction

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Estimating Computer System Capacity

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop best-practice procedures for determining the saturation point of in-house, agency computer systems. Benefits include more timely and cost-effective system acquisitions, and better management and planning of ADP resources.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Guideline on Forecasting Workload and Service

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Common Benchmark Library

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To determine the feasibility, and, if appropriate, to develop a common library of benchmark programs. Feasibility will be determined after a prototype library is developed and agency use of it is monitored. Benefits include reduced benchmark construction costs on the part of agencies, more accurate agency benchmarks (which result in more optimal system acquisitions), more timely agency procurements, and reduced vendor benchmark costs.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 42-1 Guidelines for Benchmarking ADP Systems in the Competitive Procurement Environment

Guideline on Constructing Benchmarks for ADP System Acquisitions

FIPS PUB 75 Guideline on Constructing Benchmarks for ADP System Acquisitions

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Monitoring the Performance and Costs of Acquired Computer Services

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To provide best-practice guidance to agencies on procedures for ensuring that the cost and functional levels of service of acquired computer services remain constant. Benefits include improved monitoring of contractual, service obligations, and reduced risks of cost increases during the life of a computer service contract.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 42-1 Guidelines for Benchmarking ADP Systems in the Competitive Procurement Environment

Guideline on Acquiring Computer Services

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Conducting Installation Performance Audits

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop a guideline describing best-practice techniques for auditing the performance of a computer installation. The guideline will be directed to the auditor, external to the installation, who must independently assess the installation's performance. Benefits include better and more thorough audits of installation performance than have been performed in the past.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUB 49 Guideline on Computer Performance Management: An Introduction

6. Additional Information

None

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Evaluating System Alternatives

2. Responsible Group/Individual

Operations Engineering Division/D. Conti

3. Objectives and Benefits

To develop a guideline which describes best-practice techniques and procedures for determining the best alternatives for increasing system capacity (ranging from system tuning to system upgrade). Benefits include better planning on the part of ADP managers and more cost-effective solutions to obtaining increased capacity.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

Guideline on Estimating Computer System Capacity

6. Additional Information

None

DATA ELEMENTS AND REPRESENTATIONS

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Countries, Dependencies, Areas of Special Sovereignty and Their Principal Administrative Subdivisions

2. Responsible Group/Individual

Application Systems Division/ J. Walkowicz

3. Objectives and Benefits

Objectives: To achieve a government-wide standard code for foreign countries and their subdivisions.

Benefits: This standard will improve the interchange of automated data about foreign countries among the various Federal groups concerned with such matters.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 9, 10-2, 55, 66, 70

6. Additional Information

This publication will revise FIPS PUB 10-2 and FIPS PUB 5-1 and extend their coverages considerably into greater depth and detail.

Dept. of State Office of the Geographer will serve as maintenance agent.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Identification of Federal, Federally-Assisted and Selected Other Organizations.

2. Responsible Group/Individual

Application Systems Division/ R. Saltman

3. Objectives and Benefits

Objectives: To develop a single government-wide code for identifying Federal and related organizations for automated interchange.

Benefits: Enables users of data concerned with activities, expenditures and resources of Federal agencies to interchange data about Federal agencies with a minimum of difficulty. Effectively increases size of data base available to users of such data.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 9, 10-2, 55, 66, 70

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Standard Occupational Classification Codes

2. Responsible Group/Individual

Application Systems Division/J. Walkowicz

3. Objectives and Benefits

Objective: To provide for the maximum utilization of the data resources of the Federal Government and the avoidance of unnecessary duplications and incompatibilities in the collection, processing, and dissemination of data.

Benefits: To improve the potential for new uses of data already collected by providing for uniform data elements in each data base.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

This list of occupations and associated codes is already a Federal statistical standard approved by the Office of Federal Statistical Policy and Standards. The adoption of this standard as a FIPS is a necessary process of coordination to assure Government-wide uniformity.

6. Additional Information

The Office of Federal Statistical Policy and Standards will serve as the maintenance agent.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Water Bodies of the World

2. Responsible Group/Individual

Application Systems Division/ J. Walkowicz

3. Objectives and Benefits

Objective: To provide a Government-wide standard code for water bodies of the world.

Benefit: Enables users of data concerned with water bodies to more easily interchange data, and extends the data bases associated with this data element to all users.

4. Associated Voluntary Standards Efforts

ANSI X3L9/207 (proposed standard)

5. Associated Federal Standards

DOD Standard WA-SA
DIA Standard STIDE00184
FIPS Standards 5-1, 6-3, 8-4, 9, 10-2, 55, 66, 70

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Guideline on Alphanumeric Sequencing of Geographic Names

2. Responsible Group/Individual

Application Systems Division/ R. Saltman

3. Objectives and Benefits

Objective: To promulgate a government-wide standard method for alphabetizing geographic names containing numbers, abbreviations, and special forms.

Benefit: Implementation of the standard will enable users of geographic files to more easily match one file against others because the files will be sequenced in similar order. This increases the availability of more data bases to users of geographic data.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 9, 10-2, 55, 66, 70.

6. Additional Information

Geological Survey, U. S. Bd. on Geo. Names and Bu. Census are cooperating in this effort.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Named Populated Places and Related Entities of the United States (now FIPS 55 Guideline).

2. Responsible Group/Individual

Application Systems Division/H. Tom

3. Objectives and Benefits

Objective: To assign a numerical code to all identified populated places and to certain related entities in order to provide a uniform geographical identification system used throughout the Federal Government.

Benefit: To enable users of geographic data to more easily communicate among themselves in an automated form, and to make available to all users data bases that are geographically addressed.

4. Associated Voluntary Standards Efforts

ANSI X3.47-1977

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 9, 10-2, 66, 70

6. Additional Information

This effort will convert this publication, now a guideline, to a standard. This effort will also extend coverage to all U. S. territory and add SMSA and Congressional District.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Products and Services in Federal Procurement

2. Responsible Group/Individual

Application Systems Division/J. Walkowicz

3. Objectives and Benefits

Objective: To develop a standard coding scheme for products and services purchased by the Federal Government.

Benefit: This will enable cross-checks to be more easily made to compare prices of goods and services purchased by different agencies at different times from different vendors. Analysis of this data should result in better procurement decisions.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 10-2, 55, 66, 70

6. Additional Information

Federal Procurement Data Center is lead agency.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

FIPS 8-5: Standard Metropolitan Statistical Areas (Revision)

2. Responsible Group/Individual

Application Systems Division/H. Tom

3. Objectives and Benefits

Objective: To promulgate the government-wide standard codes for SMSA's.

Benefit: Enables users of U. S. Bureau of the Census statistical data concerning SMSA to easily identify SMSA in computerized form. Improves ability to interchange data about SMSA's.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 9, 10-2, 55, 66, 70

6. Additional Information

Revision of FIPS 8-4 following 1980 Census.
Office of Federal Statistical Policy and Standards is lead agency.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Fields of Research

2. Responsible Group/Individual

Appication Systems Division/R. Saltman

3. Objectives and Benefits

Objective: To develop a government-wide coding scheme to identify fields of research.

Benefit: Has value in the analysis of grants and contracts for identifying funds going to particular fields and in the analysis of numbers of trained persons to identify surplus or deficiencies of manpower.

4. Associated Voluntary Standards Efforts

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 10-2, 55, 66, 70

6. Additional Information

NSF is lead agency

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Population Group Designation

2. Responsible Group/Individual

Application Systems Division/R. Saltman

3. Objectives and Benefits

Objective: To develop the data set and the coding scheme for race, ethnic group and national origin necessary to meet requirements of law and regulation.

Benefits: A more accurate identification than has been possible heretofore with increased interchange of data.

4. Associated Voluntary Standards Efforts

None

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 9, 10-2, 55, 66, 70

6. Additional Information

Other agencies must be brought into development program, including DOD, OPM, EEOC, CRC, etc.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Educational Level

2. Responsible Group/Individual

Application Systems Division/R. Saltman

3. Objectives and Benefits

Objective: To develop a standard coding scheme for level of education achieved.

Benefit: This has high applicability to statistics concerned with correlation of educational level with other human factors and attributes.

4. Associated Voluntary Standards Efforts

In professional field of education.

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 10-2, 55, 66, 70

6. Additional Information

Lead agencies are DoEd., OPM and NSF

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

Named Populated Places and Related Entities of Selected Other Countries

2. Responsible Group/Individual

Application Systems Division/H. Tom

3. Objectives and Benefits

Objective: To develop a coding scheme for useful worldwide locations to extend FIPS 55 capability.

Benefit: To extend FIPS 55 benefits to worldwide locations.

4. Associated Voluntary Standards Efforts

ANSI X3.47-1977

5. Associated Federal Standards

FIPS PUBS 5-1, 6-3, 8-4, 10-2, 55, 66, 70

6. Additional Information

This expands FIPS PUB 55 to selected worldwide coverage.

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

   Earth Science Program Standards

2. Responsible Group/Individual

   Application Systems Division / R. Saltman

3. Objectives and Benefits

   Objective: To put into FIPS system earth science program standards recommended by lead agency USGS.

   Benefit: To increase capabilities for automated interchange of data used in the earth sciences. Extends range of data bases available to users of earth science data.

4. Associated Voluntary Standards Efforts

   Not identifiable at this time.

5. Associated Federal Standards

   FIPS PUBS 5-1, 6-2, 8-4, 10-2, 55, 66, 70

6. Additional Information

FEDERAL ADP STANDARD OR GUIDELINE DESCRIPTION

1. Title of Standard

   Transportation Program Standards

2. Responsible Group/Individual

   Application Systems Division/R. Saltman

3. Objectives and Benefits

   Objective: To put into FIPS system transportation program standards recommended by lead agency DOT.

   Benefit: To increase capabilities for automated information interchange in transportation programs. Extends range of data bases available to users of transportation data.

4. Associated Voluntary Standards Efforts

   Cannot be specifically identified at this time.

5. Associated Federal Standards

   FIPS PUBS 5-1, 6-2, 8-4, 9, 10-2, 55, 66, 70

6. Additional Information