

Titan User's Guide

December 2008



National Institutes of Health
Center for Information Technology
NIH Data Center
12 South Drive MSC 5607
Bethesda, Maryland 20892-5607

Publication No. CIT173



TABLE OF CONTENTS

1	ORIENTATION	1
1.1	CIT (CENTER FOR INFORMATION TECHNOLOGY)	2
1.1.1	Division of Computer System Services (DCSS).....	3
1.1.1.1	Application Hosting on Enterprise Systems.....	3
1.1.1.2	Helix Systems.....	7
1.1.2	Division of Computational Bioscience (DCB).....	9
1.1.3	Division of Enterprise and Custom Applications (DECA)	9
1.1.4	Division of Network Systems and Telecommunications (DNST)	10
1.1.5	Division of Customer Support (DCS)	11
1.2	MAPS AND DIRECTIONS.....	11
1.3	TELEPHONE NUMBERS	17
1.3.1	NIH Data Center Services	18
1.3.2	Online Telephone and E-Mail Directories	19
1.3.2.1	NIH Enterprise Directory (NED)	19
1.3.2.2	Customer Locator	19
1.3.2.3	HHS Directory.....	20
1.4	OPERATING HOURS.....	20
1.5	PROPER USE OF THE NIH DATA CENTER.....	22
1.6	CONTRACTING GUIDELINES	24
1.7	ACCESS FOR PERSONS WITH DISABILITIES	25
2	REGISTRATION AND DEREGISTRATION	27
2.1	ACCOUNT OFFICIALS	27
2.2	REGISTRATION FOR SERVICES	28
2.2.1	Account Sponsors.....	30
2.2.2	Accounts.....	32
2.2.3	Userids.....	32
2.2.3.1	Userids with Non-expiring Passwords	33
2.2.3.2	Titan Userids for Remote Access Authorization.....	33
2.2.3.3	Inactive Userids.....	34
2.2.4	Account Authorization Forms	34
2.2.4.1	CIT Account Request for NIH Customers	34
2.2.4.2	CIT Account Request for Non-NIH Customers	35
2.2.4.3	Annual Renewal of Interagency Agreement	35
2.2.4.4	Deregistration Official Authorization	35
2.3	WEB SPONSOR.....	35
2.3.1	Web Sponsor Functions	36
2.3.2	Access to Web Sponsor.....	38
2.4	DEREGISTRATION FROM SERVICES	40
2.4.1	Deregistration Officials	40
2.4.2	Terminating Use of Services	41

3	CHARGING	43
3.1	CHARGING FOR INDIVIDUAL SERVICES	43
3.1.1	Discount Processing	45
3.2	BILLING.....	45
3.2.1	Billing Coordinators	46
3.2.2	Refund Policy	47
3.3	CONTROLLING COSTS	48
4	SECURITY AND DISASTER RECOVERY.....	49
4.1	PHYSICAL SECURITY.....	51
4.2	INPUT/OUTPUT CONTROLS	52
4.3	SECURITY VIOLATIONS	52
4.4	DISASTER RECOVERY	53
4.5	SECURITY COORDINATORS	54
4.6	RESOURCE ACCESS CONTROL FACILITY (RACF).....	55
4.6.1	RACF Passwords.....	55
4.6.1.1	Resetting Forgotten Passwords	56
4.6.1.2	General Password Tips.....	57
4.6.2	RACF Definitions	58
4.6.3	Protecting Data Sets	61
4.6.4	Web RACF.....	64
4.6.5	TSO RACF.....	66
4.6.6	Tape Data Security	68
4.7	PROTECTION FOR SCRATCHED DATA SETS	68
5	USER SUPPORT.....	69
5.1.1	SOFTWARE SUPPORT.....	69
5.2	CONSULTING SERVICES	72
5.2.1	General Help Desk Assistance	72
5.2.2	IT Service Request	72
5.2.3	Networking and Telecommunications Assistance	74
5.2.4	Relational Database Assistance.....	75
5.2.5	Assistance for Implementing Non-NIH Software.....	75
5.2.6	Additional Web-based Customer Support.....	76
5.3	TRAINING.....	77
5.3.1	Classroom Training.....	77
5.3.2	Independent Training	78
5.4	DOCUMENTATION.....	78
5.4.1	CIT Publication Service	78
5.4.2	Online Documentation via BookManager.....	80
5.5	CONTACT BETWEEN USERS AND CIT	80
5.5.1	Titan News	80
5.5.2	Electronic Mail	80
5.5.3	Message Facilities	81
5.5.4	CIT-Sponsored Users Groups	81
5.6	INPUT/OUTPUT DISTRIBUTION SERVICES	82

5.6.1	Output Boxes.....	82
5.6.2	Misdirected Output.....	84
6	NIH CONNECTIVITY AND NETWORK SERVICES.....	85
6.1	ROLE OF NIHNET	85
6.1.1	NIHNET-Based Services	85
6.1.2	Useful Web Services	86
6.1.3	Remote access to the NIHnet	87
6.1.3.1	Parachute for Dialup Access	87
6.1.3.2	VPN.....	88
6.1.4	Domain Name Servers	89
6.2	ACCESS INFORMATION SUMMARY	89
6.3	TITAN INTERACTIVE TCP/IP SERVICES.....	90
6.3.1	Windows Connectivity	91
6.3.2	Macintosh Connectivity	92
6.4	TITAN FILE TRANSFER AND DATA EXCHANGE	92
6.4.1	File Transfer Using FTP.....	93
6.4.1.1	WS_FTP Pro for Windows	94
6.4.1.2	FTP for the Macintosh.....	95
6.4.2	Web-based Secure File Transfer	95
6.4.3	SSH (Secure Shell).....	95
6.4.4	IND\$FILE for 3270 File Transfer	96
6.4.5	Connect:Direct	96
6.4.6	Exchanging Tapes with Other Installations	97
6.5	TITAN VPS PRINTING SERVICE	98
6.6	NETWORK JOB ENTRY (NJE).....	99
7	SYSTEMS AND APPLICATIONS SOFTWARE	101
7.1	OPERATING SYSTEMS	101
7.1.1	Titan Operating System.....	101
7.1.1.1	Cross-System Enqueue.....	102
7.1.1.2	Software Features Not Permitted at NIH	102
7.1.2	Open Systems	104
7.2	TSO	104
7.2.1	ISPF (Interactive System Productivity Facility)	110
7.2.2	MAX.....	111
7.2.3	MVS/QuickRef.....	112
7.2.4	User Display Facility (UDF).....	112
7.2.5	NIH WYLBUR	112
7.3	CICS (CUSTOMER INFORMATION CONTROL SYSTEM).....	114
7.4	DATABASE SYSTEMS.....	114
7.4.1	Model 204	115
7.4.2	IMS (Information Management System)	116
7.4.3	Relational Database Services	117
7.4.3.1	DB2	117
7.4.3.2	Using Titan as an Oracle Client	118
7.5	PROGRAMMING LANGUAGES.....	118

7.5.1	COBOL	118
7.5.2	VS FORTRAN	119
7.5.3	PL/I.....	119
7.5.4	High Level Assembler.....	119
7.5.5	REXX	120
7.5.6	C/C++	120
7.6	SILK WEB TECHNOLOGIES.....	120
7.6.1	SILK Web-Based Services.....	121
7.6.2	SILK Web Server Options	123
7.6.2.1	Public Server	123
7.6.2.2	Secure Server.....	124
7.6.2.3	Mainframe Data Set Format.....	124
7.6.2.4	Customized Servers.....	126
7.6.2.5	View/Download Utilities for Public or Private Data Sets.....	128
7.6.3	Web Interfaces for User Applications.....	129
7.7	SCIENTIFIC STATISTICAL SYSTEMS	129
7.7.1	SAS.....	130
7.7.2	BMDP.....	131
7.7.3	SPSS	131
7.8	INTERACTIVE OUTPUT FACILITY (IOF)	131
7.9	TITAN E-MAIL SERVICES	132
7.9.1	Easymail.....	132
7.9.2	Formsmail.....	133
7.9.3	SENDMAIL Procedure.....	133
7.10	FILE MANAGEMENT SYSTEMS.....	133
7.10.1	VISION:Builder	133
7.10.2	IRS.....	133
7.11	DOCUMENTATION SOFTWARE	134
8	PRINTING SERVICES.....	135
8.1	CENTRAL PRINTING THROUGH BATCH JOBS	135
8.1.1	Jobs Run at Other NJE (Network Job Entry) Nodes.....	136
8.1.2	Output Delivery.....	136
8.2	NETWORK PRINTING SERVICE.....	136
8.3	PRINTING FROM THE WEB	136
9	BATCH JOB SERVICES.....	139
9.1	OPERATING SYSTEM OVERVIEW	139
9.2	JOB CONTROL LANGUAGE OVERVIEW	140
9.3	JOB CLASS SUMMARY.....	140
9.4	JOB TURNAROUND.....	140
9.5	OFF-HOURS JOB PROCESSING	140
9.6	JOB MANAGEMENT THROUGH THE WEB.....	141
10	STORAGE AND BACKUP OF DATA.....	143
10.1	PUBLIC DISK STORAGE.....	144
10.1.1	SMS/HSM.....	144

10.1.1.1	Incremental Backup and Recovery for Data Sets.....	145
10.1.1.2	Managing Older Migrated Data Sets.....	146
10.1.1.3	Titan Management Classes.....	147
10.1.2	Estimating Direct Access Space Requirements.....	148
10.2	TAPE STORAGE	149
10.2.1	Tape Management System Features.....	149
10.2.2	TMS Error Conditions.....	151
10.2.3	Tape Security.....	151
10.2.4	Foreign Tapes	151
10.2.5	Purchasing Tapes.....	152
11	HARDWARE FACILITIES.....	153
11.1	TITAN CONFIGURATION	153
11.1.1	External Device and Channel Specifications	154
11.1.1.1	Direct Access Device Specifications.....	154
11.1.1.2	Magnetic Tape Device Specifications.....	154
11.1.1.3	Output Device Specifications.....	155
12	INDEX	157

1 ORIENTATION

The *Titan User's Guide* is published and maintained by the Center for Information Technology, for those who use the Titan mainframe (z/OS) system of the NIH Data Center. Titan is based on the IBM z9-BC (business class) server, known for its reliability, availability, scalability, serviceability, and virtualization.

This manual describes the services, registration, standards, security-related issues (see Section 4), hardware, where to go for additional information, and how to request customer support. Refer to the manual *Titan Batch Processing* for information on batch processing and job control language (JCL) for the Titan system. See Section 5.4 for information on ordering documentation.

Visit the CIT Titan system on the web by going to:

<http://cit.nih.gov>

and clicking on NIH Data Center under the Quick Links list on the right. Next select An Overview of the Data Center, and then click on z/OS.

Any questions about the content or meaning of information in the *Titan User's Guide* should be directed to the NIH Help Desk. The location and telephone number for the NIH Help Desk and other important groups can be found in Section 1.3.1. Other enterprise application hosting systems—a Unix-based system for hosting general applications (EOS); and Windows Server Services—are only briefly described in this document. Please contact the NIH Help Desk for further information about the Unix and Windows platforms.

Between updates to this manual, users are informed of changes through CIT's online resources including:

- *Titan News*, an online mail facility. Join the NIH Listserv list “CIT-Titan-News” at <http://list.nih.gov/archives/cit-titan-news.html>.
- *Interface*, a web-based periodical. To subscribe to *Interface Online* via Listserv or to order the printed version, go to <http://datacenter.cit.nih.gov/interface>.
- CIT web pages (<http://cit.nih.gov>)

These resources announce changes in CIT policies and standards of service, as well as all significant modifications to hardware and software on various platforms at the data center. This version of the *Titan User's Guide* is updated through *Interface* Number 242, Fall 2008 and the *Titan News* online newsletter of November 13, 2008. New and prospective customers may obtain the latest issue of *Interface* from the NIH Help Desk. (See Section 5.2.1.) For CIT publication services, visit:

<http://publications.cit.nih.gov>

Service Level Description for Titan

To view the Mainframe (Titan) Batch and Interactive Processing Service Level Description go to:

<http://cit.nih.gov/ProductsAndServices/ApplicationHosting/ApplicationAndWebHosting/zOSSystemTitan.htm>

and scroll down to the link for the “Mainframe Batch and Interactive Processing Service Level Description.”

1.1 CIT (CENTER FOR INFORMATION TECHNOLOGY)

CIT provides a variety of information technology services on a cost-recovery basis to the NIH and other government agencies, and conducts research and development related to the application of computer methodology to biomedical research.

The Center for Information Technology (CIT) provides, coordinates, and manages information technology and advances computational science. CIT supports NIH's research and management programs with efficient, cost-effective administrative and high-powered scientific computing, software development, networking, and telecommunications services. CIT also provides bioinformatics support through its scientists, engineers, and mathematicians.

Among its activities, CIT:

- engages in collaborative research and provides collaborative support to NIH investigators in the area of computational bioscience
- provides efficient, cost-effective information systems and networking services
- provides state-of-the-art scientific and administrative computing facilities
- identifies new computing technologies with innovative applications to biomedical research
- creates, purchases, and distributes software applications
- provides NIH staff with computing information, expertise, and training
- provides data processing and high-performance computing facilities, integrated telecommunications data networks, and services to the U.S. Department of Health and Human Service (HHS) and other federal agencies
- serves as a data center to HHS and other federal agencies
- develops, administers, and manages NIH systems and provides consulting services to NIH Institutes and Centers (ICs), in support of administrative and business applications.

This section briefly describes some of the components of the Center for Information Technology.

For more information on CIT visit:

<http://cit.nih.gov>

1.1.1 Division of Computer System Services (DCSS)

The Division of Computer System Services (DCSS) plans, implements, operates, and supports centrally owned or administered computing resources for NIH enterprise use. The Division promotes awareness and efficient and effective use of these computing resources through customer outreach, consultations, training, and documentation.

DCSS manages enterprise e-mail, messaging, and directory services for NIH. The multi-platform NIH Data Center supports Oracle and SQL database services, Windows, Unix, and z/OS operating systems, web hosting, co-location, and disaster recovery services. DCSS provides the Helix systems and scientific applications for NIH scientists. Customers can access scientific and administrative data and applications, as well as develop new applications to meet the needs of an office, an agency, a lab, or a worldwide community of collaborators using the computing environment and platform most suitable for their applications.

In addition, DCSS enhances collaborative efforts by supporting videocast, web conferencing, teleconferencing, podcasting, and the Federal Video Relay Service (FedVRS). DCSS investigates new and emerging computing requirements of customer programs. It conducts research to identify, evaluate, and adapt new computer architectures and technologies to meet customers' needs and to enhance current service offerings. The Division works closely with customers to meet user specific requirements in an economical and energy efficient manner.

For more information on all of these services, go to:

<http://cit.nih.gov>

1.1.1.1 Application Hosting on Enterprise Systems

Designated as a HHS consolidated data center, the NIH Data Center offers full-service enterprise application hosting on the data center's mainframe z/OS (Titan), hosted Unix (EOS), and Windows servers as well as co-location services to house customer-owned servers and related equipment. Both full-service application hosting and co-location services offer:

- yearly SAS 70 Type II audits—validate the data center's physical security, operating practices, and procedures
- physical security—includes card key and biometric access, video monitoring, and guards on duty 24 x 7

-
- redundant, high-bandwidth connectivity
 - reliable infrastructure—environmental controls, UPS (uninterruptible power source)
 - operations staff on-site, 24 x 7

The NIH Data Center can host enterprise applications for NIH and other government agencies.

In general, the NIH Data Center operates on a cost-recovery basis; charges to customers are based on the resources they use. See Section 3.1 for the current rates for the Titan system.

The data center supports high-speed network connections. NIHnet, supported by CIT, is the NIH backbone network that interconnects the Institutes and Centers (ICs), local area networks (LANs), and the NIH Data Center with the Internet, Internet2, HHS operating divisions, and other government agencies. For additional information on NIHnet, see Section 6.1.

For more information on NIH Data Center hosting services, visit:

<http://cit.nih.gov>

and select NIH Data Center under Quick Links, on the right.

Co-Location Services

Many organizations already own their own servers and other equipment for hosting applications but find that they are simply running out of floor space or they lack the resources (e.g., security, redundant power, and high-bandwidth connectivity) to house their equipment properly. To address this problem, CIT offers on-campus and off-campus co-location—housing customers' equipment in a secure, climate-controlled environment, where customers have 24 x 7 access.

The data center supports co-location services for equipment owned and managed by our customers. As with other services, use of the NIH co-location facilities is charged on a cost recovery basis. Fees for this service are based on the amount of space and power required by the customer.

- The two on-campus co-location sites are in building 12—in secure, separate parts of the CIT data center.
- The off-campus co-location site is in a secure commercial location connected by extremely high bandwidth—away from the NIH campus (in Northern Virginia), yet under the auspices of CIT. The off-campus co-location still ensures the full confidentiality, availability, and integrity of NIH information.

For more information, visit:

<http://cit.nih.gov>

and select Co-Location services under Quick Links, on the right.

Full-Service Hosting

Full-service application hosting on our secure, well-managed, central servers running z/OS (Titan), hosted Unix, or Windows provides:

- firewall and intrusion detection services, penetration testing, security assessments
- maintenance and backups for your files
- a disaster recovery program available for your critical applications
- comprehensive change management
- redundant hardware and software in critical areas
- 24 x 7 system monitoring and problem resolution
- multiple platforms
- all server maintenance
- access to data on other systems
- dedicated application coordinators to help our customers

To assist users with the full extent of services, CIT provides consulting, training, and documentation. This manual is intended to provide users with a general description of what the Titan system offers and how to use it effectively.

Besides Titan, other components of the enterprise systems include:

Hosted Unix (EOS)

A Unix-based environment at the NIH Data Center—currently hosts a variety of production and development applications. Hosted Unix provides a stable, robust hosting solution for enterprise-wide Unix applications. It features both high-end and mid-tier servers, as well as shared and stand-alone servers for Oracle databases and related products and complete web capabilities. CIT works with users to customize hardware and software configurations to meet their requirements. For more information, refer to the *Hosted Unix (EOS) User's Guide*, available from the CIT publication service (see Section 5.4).

Operating systems:

- HP-UX
- Sun Solaris

Database:

- Oracle on shared or dedicated Unix servers

Connectivity:

- FISMA-compliant highly available, secure connectivity, such as:
 - SSH
 - Connect:Direct

Middle Tier Application Servers:

- Oracle Application Server
- Apache Server

Windows Server Services

The NIH Data Center hosts Windows-based applications on HP Enterprise class servers and SANs (storage area networks) that are carefully managed and monitored on a 7x24 basis. The Windows servers provide a computing environment suitable for critical enterprise-wide applications.

We support the major components of the Windows Server Suite—including Terminal Server, SQL Server 2005, and IIS—in our enterprise-wide environment. The NIH Data Center provides these services in virtualized, shared, and dedicated server environments. In addition, we support ColdFusion in both a shared and dedicated web environment.

Microsoft's Content Management Server provides application hosting in a shared web environment, saving your organization money by leveraging an economy of scale model. The Division of Enterprise and Custom Applications is partnering with the Division of Computer System Services to provide the application and template development for the NIH Content Management Server service.

The Windows environment supports SharePoint, a web service for information sharing and document collaboration using Microsoft Office SharePoint Server 2007 (MOSS).

The NIH Data Center also offers a Virtual Server service in the Windows environment that resides on a pool of servers running under VMWare ESX software. Server virtualization allows multiple operating system instances to pull resources from a pool of physical servers. The customer receives an economical service similar to having a dedicated server, even though multiple "virtual systems" are running on the same server.

Other Services:

- Central Email Service (CES) providing e-mail and messaging services for the NIH community, including Active Directory (AD) services

- a disaster recovery program for disaster recovery facilities and services for “critical” applications that run on the Titan and hosted Unix systems (see Section 4.4)
- search engine services for NIH web sites, using Google
- Media Sanitization Service for the secure disposal of storage media
- Kiwi Wiki Service for web collaboration

CIT is offering a free Linux test pilot, for a limited period time, to help determine if Linux virtual servers should be offered on a production basis. During the test pilot, the CIT Linux virtual servers will be available to test open source technologies or applications. For further information, contact the NIH Help Desk and ask to speak with a virtual Linux server consultant.

1.1.1.2 Helix Systems

The NIH Helix Systems manage high-performance computing systems for the NIH intramural scientific community. The front-end 32-processor Opteron system (with the network name helix.nih.gov) is used for many scientific applications as well as general purpose tasks, such as reading mail, transferring files, and web browsing.

An additional system, the NIH Biowulf Cluster (biowulf.nih.gov), offers computational capabilities for compute-intensive, large-memory, or swarms of independent jobs. Biowulf is a 5000+ processor Linux cluster, built by members of the Helix Systems staff, which runs the Redhat Linux operating system.

In addition to the standard Unix tools for software development, text formatting, and network communications, software packages for the Helix System include:

Scientific applications:

- BioInformatics: EMBOSS, Fasta, Blast, Wu-Blast, ClustalW, Pfsearch, HMMer, BLAT, MUMmer, RepeatMasker, MFOLD, Linkage and Phylogenetic Analysis programs
- Systems Biology: The Biobase portfolio of databases including ExPlain for interpretation of microarray and ChIP-chip data, Transfac for signal transduction pathway data, TransPro for annotated transcription start sites, and TransCompel for composite gene regulatory elements.
- Structural Biology: X-Plor, Quest, Gaussian, Charmm, GAMESS, NAMD, CNS, Gromacs, Prospect, Haddock, APBS, Rosetta
- Molecular Modeling: AMBER, Charmm, Q-Chem, DOCK, Fdiscover, LOOK, Insight, NAOMI, Sybyl; other programs available on Helix through Mmignet.
- Mathematical/Graphical Analysis: Mathematica, MATLAB, S-PLUS, S, IMSL, xmgr, Xplot, GAUSS, Physica, R, BioConductor, SAS, Octave
- Image Analysis: Analyze, AnalyzeAVW, AVS, IDL, GPHIGS, PHIGURE, AFNI, CTF

-
- Molecular Graphics: Grasp, Molscript, Molauto, PovChem, Povscript, PovRay, Ribbons

Biological Databases:

A large collection of nucleic and protein sequence databases are maintained in several formats on the Helix Systems, including Genbank, GenPept, NCBI's nt and nr, Refseq, Swissprot/Trembl, and genome data. A comprehensive list with details and update status is available at:

<http://helixweb.nih.gov/helixdb.php>

Programming Language/Tools:

- C, FORTRAN 77, Fortran 90, Intel & Portland Group compilers, Lisp, gcc, C++, and other typical Unix tools like awk and perl
- MPI library and PBS batch systems
- Static analyzer, debugger, and performance analyzer tools

Subroutine Libraries:

- IMSL: mathematical and statistical routines
- FIGARO: 2- and 3-d interactive graphics routines

Network Services:

- IMAP: mail server for mail clients, pine, and Emacs rmail
- SquirrelMail: web access to Helix e-mail
- ssh: secure encrypted communications between two systems
- WinSCP, Fugu, FileZilla, and scp: secure Internet file transfer utilities
- X Window System: supports X-windows scientific applications such as S-PLUS, Mathematica, MATLAB, SeqLab
- Netscape, mozilla, and lynx: web browsers
- X-Win32: web browser plug-in that lets Windows PCs run the X Window System

Utilities:

- Editors: pico, vi, jot, nedit, xedit, GNU Emacs, ed, ex
- Image display and manipulation: imgworks, xv, convert, GIMP

Web-based Services: <http://helix.nih.gov/webapps>

- Scientific applications: EMBOSS-Lite (formerly GCG-Lite), Molecules To Go, UCSC Genome Browser mirror, ExPlain, Transfac, TransPath, TrxFacMiner, StrucTools, and other web interfaces to scientific tools
- Proteomics: Mascot Mass-Spectroscopy search engine

-
- WHALES: automatic alert service for new sequences in the major nucleotide and protein databases
 - Xwindows: Graphics applications that run on helix can be displayed on a desktop Mac or PC

For Helix systems documentation, go to:

<http://helix.nih.gov/docs/>

The Helix systems are restricted to NIH use. For additional information about the Helix Systems, go to:

<http://helix.nih.gov>

1.1.2 Division of Computational Bioscience (DCB)

The Division of Computational Bioscience (DCB) of CIT is a research and development organization that provides scientific and technical expertise in computational science and engineering to support the NIH Intramural Research Program (IRP). Working with all of the Institutes and the Clinical Center, DCB applies the concepts and technologies of computer science, engineering, physical science and mathematics to biomedical applications including the areas of image processing, biomedical informatics, genetic databases, structural biology, scientific visualization, medical imaging, telemedicine, signal processing, biomedical instrumentation, knowledge management, and biomathematics. DCB develops computational methods and tools for solving biomedical laboratory and clinical research problems and manages centralized scientific computational and communication systems. DCB also provides an environment to mentor computational scientists and engineers for careers in biomedical research.

1.1.3 Division of Enterprise and Custom Applications (DECA)

The Division of Enterprise and Custom Applications (DECA) offers cost-effective business solutions to meet the needs of the NIH Community. DECA collaborates with customers in providing quality services in a number of areas:

- Application design, development, and management services at the IC-level and at the enterprise application level. Application services include website design, webpage content management, custom applications development, and business intelligence services.
- Infrastructure services for monitoring application software and for enabling user authentication.
- Professional consulting, communications, and collaboration services to help you decide the best course of action. We will advise you on system design, manage your IT project, and provide systems assurance for your applications. We also can provide a gateway that gives you a single point of access to your shared data, documents, and processes.

-
- Technical support services for creating, designing, and managing enterprise business applications, such as for time and attendance system, ethics system, day-to-business operations systems, and NIH legacy systems.

DECA professionals are committed to conducting business in a transparent and honest manner backed by technical excellence and innovation. We achieve quality through customer collaboration in developing solutions that satisfy your business needs.

1.1.4 Division of Network Systems and Telecommunications (DNST)

The Division of Network Systems and Telecommunications directs the engineering, design, implementation, and support of network infrastructure and services for the NIH wide area network (NIHnet) to facilitate the use of scientific, administrative, and other business applications. The Division manages and directs NIH telecommunications systems and develops technical requirements for the NIH ICs and implements telecommunications programs to meet the needs of the NIH community.

DNST researches, develops, and tests next-generation networking/telecommunications technologies and develops and supports applications using new network technologies, such as telemedicine. It provides consulting, guidance, and support to the ICs, helping them to meet their network requirements. To improve the information infrastructure on networking/telecommunications activities, DNST serves as liaison to the NIH ICs and other HHS components.

DNST provides cost effective and reliable wireless services for the NIH and HHS; provides a robust cost efficient and scalable cabling plant to support multimedia services at the NIH; and facilitates the implementation of Federal Telecommunication System services. The Division provides two-way radio services that meet the requirements of the NIH public safety and facilities maintenance communities; and facilitates the implementation of Federal Telecommunication System services.

The Division manages the cable plant facilities and the physical environment of the communications infrastructure. It collaborates with application developers to design general-purpose software tools that provide end user interfaces to the cable database system; and provides direct end user support for cable database questions and concerns.

DNST serves as the focal point for telecommunications service orders, and develops and disseminates recommended standards, policies, and procedures for the nationwide implementation and management of NIH networking and telecommunications systems. DNST also develops, implements, and supports remote access services to NIHnet, technical support for wireless services, and a 24-hour telephone/network support service.

1.1.5 Division of Customer Support (DCS)

The Division of Customer Support provides centralized, integrated computer support services to the NIH computing community. DCS advocates customer needs to CIT management and staff, and represents CIT services and policies to customers. It plays an active and participatory role in supporting desktop computing to the end user in the areas of software and hardware, including Internet, telecommunications, and access technologies. DCS manages the NIH Help Desk, which provides support for the wide range of IT services used at the NIH and central account establishment and management. DCS provides support tools for the NIH IT community, including a service request tracking system, knowledgebase, and automated call distribution. DCS manages the iSDP program, which establishes volume discounts and enterprise licenses for commodity software and hardware for the entire Department of Health and Human Services. DCS also coordinates and oversees CIT's Training Program for the benefit of the NIH computing community.

1.2 MAPS AND DIRECTIONS

The NIH Data Center and its associated offices are in buildings 12, 12A, and 12B on the NIH campus at 9000 Rockville Pike, Bethesda, Maryland 20892. The second primary location for the Center for Information Technology is located at 10401 Fernwood Road, Bethesda, Maryland 20817, a few miles northwest of the main NIH campus.

The main entrance to the NIH Campus is at Rockville Pike and NIH Gateway Drive, south of the Metro station. This entrance is open 24 x 7 for vehicles and pedestrians.

Note: Due to security measures, access to the campus is limited. In addition, parking is extremely limited.

Visitors to Campus

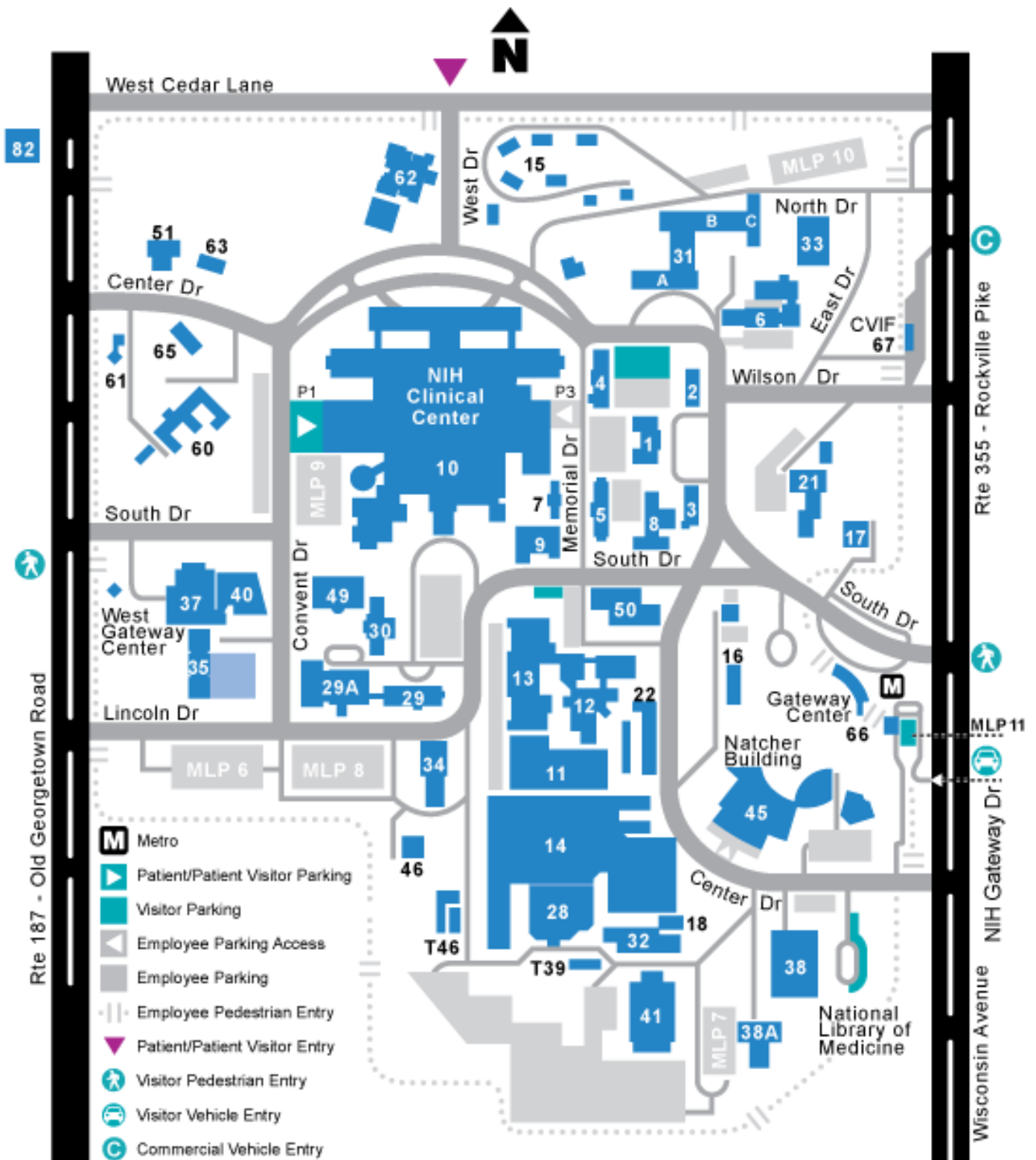
Visitors should enter the campus at the NIH Gateway Center on NIH Gateway Drive, just south of the intersection of South Drive/Rockville Pike and Metro. Visitors are encouraged to use public transportation, but those who must drive are highly encouraged to park in the MLP-11 “visitor-only” parking garage at the Gateway complex. This garage is the primary visitor parking garage for the campus.

Admittance requires a NIH ID or security screening for non-NIH personnel. For the most current access information, refer to:

<http://www.nih.gov/about/visitorsecurity.htm>

The map that follows is an abstract illustration of the NIH Campus showing the general locations of the buildings, parking areas, and main roads.

Figure 1-1 Map of the NIH Campus



VISITOR INFORMATION

Main Entrance: NIH Gateway Center

NIH Gateway Drive
Rockville Pike & South Drive

Vehicle Inspection:

5 A.M. – 10 P.M., Monday-Friday
6 A.M. – 6 P.M., Saturday-Sunday

After 10 P.M. on weekdays and 6 P.M. on weekends, all non-commercial vehicles, motorcycles and bicycles will be inspected at the Commercial Vehicle Inspection Facility (CVIF).

Pedestrians:

24 hours, 7 days a week

West Gateway Center

Near Old Georgetown Rd & South Drive
(*Pedestrians Only*)
6 A.M. – 12 P.M. Monday – Friday

Patient and Patient Visitor Entrance

Cedar Lane & West Drive

Valet Parking at Clinical Center Main Entrance

Weekdays:

Inbound Traffic Only: 7 A.M. – 7 P.M.

Weekends & Holidays:

Closed

Commercial Vehicle Inspection Facility (CVIF)

Building 67: Commercial Vehicles Only
Rockville Pike - between North Drive and Wilson Drive

Open 24 hours a day, 7 days a week

To learn about the current visitor and security issues at the NIH and to view an online version of this map, visit:

<http://www.nih.gov/about/visitor/index.htm>

For questions about campus access, please contact the ORS Information Line at orsinfo@mail.nih.gov or 301-594-6677, TTY - 301-435-1908.

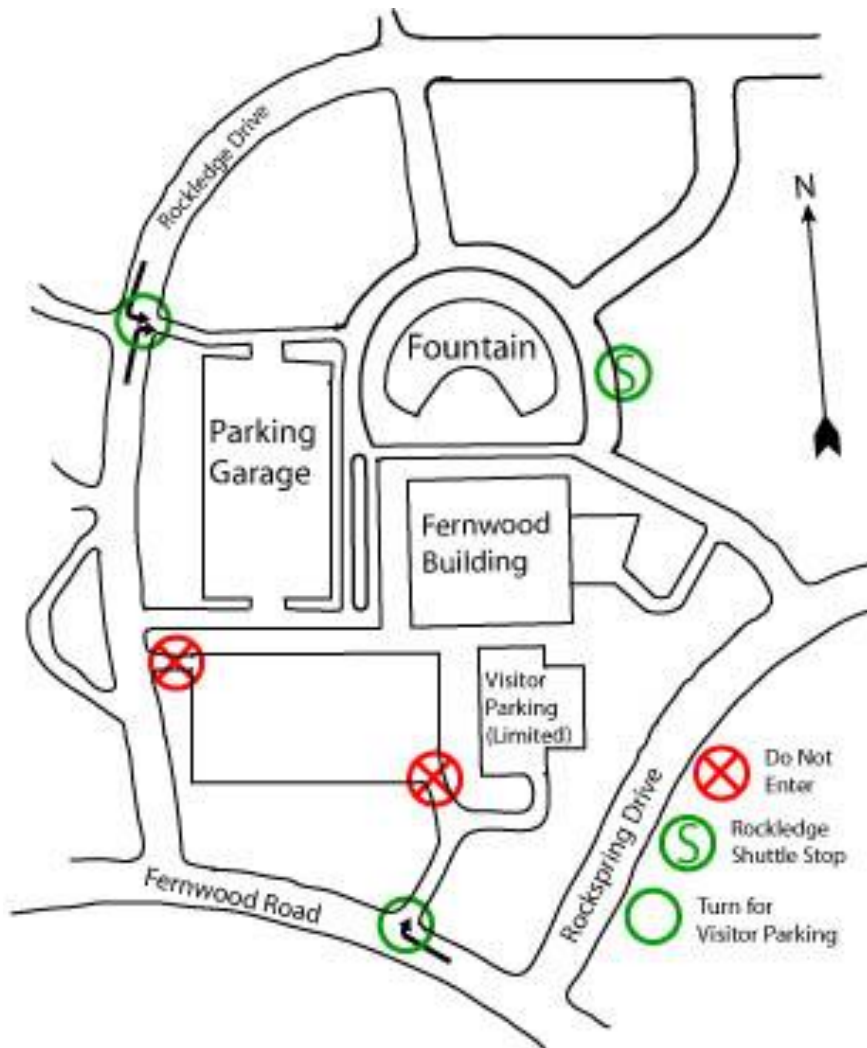
Figure 1-2. Map of Washington Area



Figure 1-3. Map of NIH Building 12 Complex



Figure 1-4. Map of Fernwood Building Access



Note: Overflow from the visitor parking lot is directed to the covered parking garage accessible from Rockledge Drive.

Directions to the NIH Data Center

By subway:

- Take the Metrorail Red Line to Medical Center stop.
- Continue walking forward down South Drive after getting off the escalator.
- Cross the intersection of Center Drive (stop sign). The NIH Data Center (building 12A) is on the left behind building 50.

See map for Metrorail.

By car:

If you plan on driving to the NIH Campus, consult:

<http://www.nih.gov/about/visitor/index.htm>

NIH visitor parking is extremely limited. We strongly encourage the use of carpools and public transportation. The NIH Police strictly enforces all parking regulations.

By bus:

- Metrobuses and Montgomery County RideOn buses make stops at the Medical Center Metro stop. Call Metro information for time schedules and routes (202) 637-7000.
- The NIH Shuttle service provides regularly scheduled transportation around the main campus and between the campus and other area NIH locations.

1.3 TELEPHONE NUMBERS

This section contains a telephone directory to key services. Keep the following information in mind:

- Users without a direct network connection can access Titan and the Helix Systems through remote access technologies. See Section 6.1.3.
- Long distance users, whose data phones are not on the FTS Network long-distance telecommunications system can access the interactive services through 800/866 numbers.
- Ten-digit dialing is required for all NIH/HHS phone numbers in the Rockville/Bethesda area. This also affects dialup access to the NIH Data Center's systems via Parachute.
- The area code for the data center is 301.

1.3.1 NIH Data Center Services

Note: The Area Code is 301. All Telephone numbers are accessible through FTS.

Figure 1-5. NIH Data Center Services

SERVICE	OFFICE	BLDG./RM.	TELEPHONE*
ENTERPRISE SYSTEMS (Titan, Hosted Unix, and Windows Server Services)			
Relational Database Support (DB2, Oracle, and SQL Server)	Division of Computer System Services	12/2200	301-496-9158
IMS Support	Large Systems Services Branch	12/2200	301-496-6244
Help Desk**	NIH Help Desk	Fernwood/300	301-496-4357
New Applications	NIH Help Desk	Fernwood/300	301-496-4357
Operating Schedule	NIH Help Desk	Fernwood/300	301-496-4357
Security Investigations and Assistance	NIH Help Desk	Fernwood/300	301-496-4357
Fax Number	--	--	301-496-6905
Security Policy	DCSS Security Coordinator	12A/4033	301-496-1053
Tape Library	Data Center Operations Branch	12/1100	301-496-6021
SCIENTIFIC SYSTEMS (Helix)			
Help Desk – Helix***	NIH Help Desk	Fernwood/300	301-496-4357
Operating Schedule – Helix	NIH Help Desk	Fernwood/300	301-496-4357
Operator - Helix	--	12/2200	301-496-6755
CONNECTIVITY SERVICES (E-mail, Networks, File Transfer, Access to Enterprise and Scientific Systems)			
Help Desk	NIH Help Desk	Fernwood/300	301-496-4357
GENERAL SERVICES			
Accounts/Billing, Registration	NIH Help Desk	Fernwood/300	301-496-4357
ADB Support***	NIH Help Desk	Fernwood/300	301-496-4357
Application Programming	Division of Enterprise and Custom Applications	Fernwood/300	301-496-4357
Co-Location Services	NIH Help Desk	Fernwood/300	301-496-4357
Data Center General Policy	Director, Division of Computer System Services	12A/4039	301-496-5381
Data Center Security Policy	DCSS Security Coordinator	12A/4033	301-496-1053
Disaster Recovery Process	Disaster Recovery Coordinator	12A/4033	301-496-1053
Documentation/Publications	NIH Help Desk	Fernwood/300	301-496-4357
Output Distribution and Foreign Tape Handling	Output Distribution	12A/1000	301-496-6183
Public Information on CIT	Planning, Evaluation, and Communications Office, CIT	12A/4063	301-496-6203
Statistical Packages	NIH Help Desk	Fernwood/300	301-496-4357
TDD/TTY Line for Hearing Impaired	NIH Help Desk	Fernwood/300	301-496-8294
Telecommunications Problems	NIH Help Desk	Fernwood/300	301-496-4357
Training	NIH Training Office	Fernwood/300	301-594-6248

* Ten-digit dialing is required for all NIH/HHS phone numbers in the Rockville/Bethesda area.

** Toll-free (for non-FTS users): 866-319-4357, TTY: 301-496-8294

***Services available to NIH employees only

1.3.2 Online Telephone and E-Mail Directories

There are several online directories available.

1.3.2.1 NIH Enterprise Directory (NED)

The NIH Enterprise Directory (NED) is a centrally-coordinated, electronic directory, developed by CIT, to maintain accurate, current information for all NIH workers and people using NIH services or facilities. NED is also used by administrative personnel for authorizing NIH services such as ID badges, NIH Library privileges, listing in the NIH Telephone and Services Directory, parking permits, Active Directory accounts, and Exchange mailboxes.

To search for information in the NED, go to:

<http://ned.nih.gov>

The public information on a person in the NED includes—telephone, pager, and fax numbers; e-mail address; building, room; mail stop, postal address, delivery address, and web address. The NED also stores a person's title, IC, organizational unit, and organizational status (Civil Service or Public Health Service employee, fellow, contractor, guest, volunteer, summer employee, or tenant). Individuals are identified in the NED via their NIH ID—the 10-digit number at the bottom of their ID badge. As more and more NIH systems use the NIH ID for identification, it is important that all records in the NED be accurate and current.

The information in the NED and all changes made through the NED are propagated to Web Sponsor (see Section 2.3).

Updating Entries

If you are associated with NIH, you can update most of your own customer information using the NED.

Assistance

If you need assistance concerning the NED or the NIH Login (NIH user name and password), please contact the NIH Help Desk. See Section 5.2.1.

1.3.2.2 Customer Locator

The CIT Customer Locator provides account and directory information for anyone with a Titan userid, through the web. Users can learn the names of the account sponsor and alternate sponsors for a Titan account. This facility displays directory information by user name or by the Titan userid. Users can set or change their output box numbers using Customer Locator. For information on output boxes, see Section 5.6.1. Customer Locator also has links to the NIH Enterprise Directory (NED) and the HHS Employee Directory.

If you are associated with NIH, you can find out if your NIH ID is registered through the Customer Locator. Enter your Titan userid in the box next to Customer Userid, and click

Display at the beginning of that line. The customer information displayed should include your NIH ID (toward the bottom).

Access

You can use the Customer Locator through your Titan login or your NIH Login (user name and password).

Visit:

<http://titan.nih.gov>

and choose which Customer Locator application to use.

1.3.2.3 HHS Directory

The Department of Health and Human Services organizational directory is available on the web. You can search the directory by employee name or look for information for a particular office. Employees can correct their directory information using an online form. Go to:

<http://directory.psc.gov>

1.4 OPERATING HOURS

Although the mainframe component of the NIH Data Center operates on a seven-day 24-hour basis, the availability of individual services varies. The operating hours for all the enterprise systems (Titan, hosted Unix, and Windows Server Services) can be found on the web by going to:

<http://cit.nih.gov>

Click on NIH Data Center under the Quick Links list on the right, and then select Operating Schedules.

Figure 1-6. Operating Hours

System Service and Day	Hours
z/OS Mainframe (Titan)	
Batch Processing	
Monday-Saturday	24 hours
Sunday	2:00 A.M. – midnight
CICS	
Sunday-Friday	7:00 A.M. – 8:00 P.M.
Saturday	8:00 A.M. – 8:00 P.M.
DB2	
Monday-Saturday	3:00 A.M. – midnight
Sunday	8:30 A.M. – midnight
IMS (Restricted Availability)	
Monday-Friday	5:00 A.M. – 7:00 P.M.
Saturday	7:00 A.M. – 3:00 P.M.
Model 204	
Monday-Saturday	6:00 A.M. – midnight
Sunday	24 hours
Oracle Gateway *	
Every day	24 hours
* Due to nightly database systems maintenance, some services may be unavailable.	
Oracle Net (SQL*Net)	
Every day	24 hours
Output Distribution Services	
Monday-Friday	24 hours
Weekends	24 hours
WYLBUR, TSO, and Batch Services	
Monday-Saturday	24 hours
Sunday	2:00 A.M. – midnight
Other CIT Services	
NIH Help Desk	
Monday-Friday (except holidays)	6:00 A.M. – 6:00 P.M.
Emergency after-hours support	6:00 P.M. – 12 A.M. (midnight)
Weekends and holidays	
Limited emergency support	8:30 A.M. – 5:00 P.M.
Other Offices	
Monday-Friday	8:30 A.M. – 5:00 P.M.

Outages outside the normal schedule are announced at 5 business days in advance, if possible. Go to:

<http://ithelpdesk.nih.gov/>

and scroll down to click on the link for the Maintenance Calendar.

Special arrangements for service beyond the announced schedule may be possible if needed; contact the head of the Data Center Operations Branch through the NIH Help Desk. See Section 5.2.1.

Unattended Service on Titan

Unattended service allows the use of some Titan services during periods of time (such as holidays) when these services would otherwise be unavailable. For the details on unattended service and information about specific holidays when unattended service will be in effect, go to:

<http://cit.nih.gov/ProductsAndServices/ApplicationHosting/AboutDataCenter/UnattendedService.htm>

Unattended service currently consists of ISPF, TSO, DB2, Model 204, and WYLBUR availability. Users can do most of their regular tasks using those software applications during the unattended service period. All batch processing services that do not require foreign tape access are available. During unattended service:

- No jobs are printed on the central printers.
- No foreign tapes are mounted (NIH tapes can be mounted).
- Normal OUTPUT HOLD time limits are enforced for jobs not awaiting printing.
- IMS will not be available.

1.5 PROPER USE OF THE NIH DATA CENTER

All users of the CIT enterprise systems are expected to abide by all laws and regulations regarding the proper use of government information technology resources. Users are expected to comply with the following when using the CIT systems:

- The enterprise systems are to be used for official government business only. Users must not use the systems for personal gain, outside business activities, political activity, fund raising, charitable activity not sponsored by a government agency, or for playing games (even in learning situations).
- Users must not use CIT systems to produce, store, display, or transmit material that is offensive to others including sexually explicit or suggestive materials.

-
- Users must not use the CIT systems to produce, store, display, or transmit material that constitutes harassment of other individuals on any basis including race, ethnicity, or sexual orientation.
 - Users must not use the CIT systems as a staging area for gaining unauthorized access to any other information systems or for, in any way, damaging, altering, or disrupting the operations of the other systems.
 - Users must not use the CIT systems and services for capturing or otherwise obtaining passwords, encryption keys, or any other access control mechanism that could permit unauthorized access to any computer system.
 - Access to information on the CIT systems is the sole responsibility of the “owner”—the account sponsor or registered user—of the information. Users must not access that information without the explicit permission of the owner, regardless of the degree of access control applied. The only exception is users may freely access information that is stored under a facility for general availability such as the web or public libraries.
 - Users are expected to use the services and facilities provided by the CIT systems in accordance with the standards set forth in the appropriate guides. If a facility is not described in any guide, contact the NIH Help Desk for assistance before attempting to use it.
 - Users must not use electronic communications such as electronic mail to harass others, send obscene messages, forward chain letters or hoaxes, or send mass mailings indiscriminately.

Users who violate these rules of behavior are subject to disciplinary action in accordance with the NIH Information Technology General Rules of Behavior.

Authorities:

- Public Law 93-579, U.S. Code 532(a), the Privacy Act (1974)
- Public Law 99-474, 18 U.S. Code 1030, the Computer Fraud and Abuse Act (1986)
- Standards of Ethical Conduct for Employees of the Executive Branch, 5 C.F.R. Part 2635
- HHS Standards of Conduct, 45 C.F.R. Part 73, Subpart M
- NIH Information Technology General Rules of Behavior at:
<http://irm.cit.nih.gov/security/nihitrob.html>
- CIT Information Technologies Policies web site
<http://cit.nih.gov/ITPolicies/>

Software distributed by the NIH Data Center, CIT, is obtained under a variety of legally binding license agreements that restrict the use, duplication, and transfer of the software and associated documentation. Unauthorized use, duplication, and/or distribution of this software can result in penalties for both the individual responsible and the National Institutes of Health, including civil damages up to \$50,000 for each occurrence and criminal penalties including fines and imprisonment.

Each software package and associated documentation distributed by the data center is authorized for limited use in conjunction with the services provided by the NIH Data Center. This software and documentation may not be duplicated or transferred to any other individual or facility. Each user who requests and receives software distributed by the NIH Data Center is responsible for insuring its proper use. In the event of improper use, unauthorized copying, or redistribution of the software and/or associated documentation, the NIH Data Center will contact the responsible user and account sponsor for corrective action. If questions arise about software distributed by the NIH Data Center, please contact the NIH Help Desk. See Section 5.2.1.

1.6 CONTRACTING GUIDELINES

When an organization is preparing or administering a contract for an application to be used at the NIH Data Center, the staff should pay particular attention to the following sections of the *Titan User's Guide*:

Figure 1-7 Important References for New Applications

Section	Title
1	ORIENTATION
2	REGISTRATION AND DEREGISTRATION
4	SECURITY AND DISASTER RECOVERY
5.1.1	SOFTWARE SUPPORT
5.2.5	Assistance for Implementing Non-NIH Software
7.1.1.2	Software Features Not Permitted at NIH
9	BATCH JOB SERVICES

In addition, the contracting office and account sponsor should be familiar with the *Titan User's Guide*.

The *Titan User's Guide* defines the NIH Data Center's current software standards; however, these change with the passage of time, in response to the needs of our users and developments in computer technology. Because of this, it is a good idea to discuss the proposed software with the Application Services Branch (ASB) before the contract is

finalized. The staff will be able to provide guidance, including information concerning hardware and software changes which may occur in the relatively near future. ASB is also familiar with many alternatives that may be used in place of standard IBM facilities and other software whose use is not permitted at NIH. Contact our staff through the NIH Help Desk. See Section 5.2.1.

1.7 ACCESS FOR PERSONS WITH DISABILITIES

It is important that all of our users have full access to CIT services and facilities. The Americans with Disabilities Act of 1992 was passed to ensure that persons with disabilities have equal opportunities and guarantees of civil rights. "Reasonable" accommodation, access to facilities and alternate forms of media and communication are inherent in the implementation of the Act. CIT is in compliance with Section 508 of the Rehabilitation Act, amended in 1998, concerning the accessibility of electronic and information technology (including web pages) for persons with disabilities. For information about Section 508, go to:

<http://508.nih.gov>

The NIH Data Center and the associated offices of CIT, such as the NIH Help Desk and the CIT Computer Training Program, are located in wheelchair-accessible buildings. Individuals who are hearing or speech-impaired can contact any person or office within the Center for Information Technology via a TDD/ TTY (Telecommunications Device for the Deaf) located in the office of the Computer Training Program. The TDD is answered during the office's regular hours. See Section 1.4.

CIT is currently running a pilot project with several participating ICs to test the NexTalk system (NTS). This service allows people with hearing disabilities, who have computer access, to communicate "live" with someone, without having to use a TTY-type device. There is no audio component to the client and all textual functions of the client are certified to be Section 508 compliant. For more information, go to:

<http://nihnextalk.cit.nih.gov>

All users, including individuals with disabilities, are welcome to attend any course in the CIT Computer Training Program for which they meet the technical and administrative prerequisites. There are elevators at both CIT training sites—buildings 12A and Fernwood. At each site, the classrooms and restrooms are on the same floor and are wheelchair accessible. Because elevators cannot be used in case of fire, students who may need assistance negotiating the stairs should inform the Training Program before the first day of class.

If any special services (such as recorded notes) will be needed, individuals should contact the Training Program at least 2 weeks in advance to make the necessary arrangements.

Users with special needs who would like to make suggestions concerning the accessibility of the NIH Data Center and its related CIT services should contact the NIH Help Desk or submit an IT Service Request (see Section 5.2.2).

For more information on IT accessibility resources and other accessibility resources, go to:

<http://irm.cit.nih.gov/policy/access.html>

2 REGISTRATION AND DEREGISTRATION

This section describes how to register users for the services offered by the Titan system and how to deregister users. Contact the NIH Help Desk if you have questions concerning registration and deregistration. See Section 1.3.1 for the phone number.

2.1 ACCOUNT OFFICIALS

When an organization uses Titan services, CIT assigns certain responsibilities relating to registration, deregistration, billing, and security to persons within the customer organization. CIT refers to these account officials as:

- account sponsors (see Section 2.2.1)
- deregistration officials (see Section 2.4.1)
- billing coordinators (see Section 3.2.1)
- security coordinators (see Section 4.5)

Characteristics of account officials:

- All account officials should be familiar with the Web Sponsor facility for displaying and changing account and customer information. (See Section 2.3.)
- For each Titan account official role (except deregistration officials), there is one primary and any number of alternates.
- Officials do not have to have a valid userid for the account(s) for which they are an account official.
- A person within an organization can hold several positions. For example, the account sponsor can also be the security coordinator, the billing coordinator, and the deregistration official.
- All Titan account sponsors and deregistration officials must be government employees.

The IC (institute/center) Executive Officer or responsible agency official assigns a deregistration official for an account. The deregistration official, in turn, can change the primary account sponsor. In addition to the deregistration official, the primary account sponsor can assign and remove alternate account sponsors, and reassign the primary account sponsor. Any account sponsor can assign, reassign, or remove security coordinators and billing coordinators.

The Account Sponsor Interest Group (ASIG) provides an informal forum for discussion of issues important to account sponsors, deregistration officials, and other account officials (e.g., billing coordinators, security coordinators). For more information, subscribe to the ASIG-L Listserv list. Go to:

<http://list.nih.gov>

to learn how to subscribe.

Figure 2-1. Account Official Assignments

Official	Assignments	Method
IC Executive Officer or responsible agency official from a non-NIH organization	Assigns/reassigns deregistration official and alternate for an account	CIT Deregistration Official Authorization form (see Section 2.2.4.4)
Anyone with proper authority	Assigns the initial account sponsor and alternate	CIT Account Request Form (See Sections 2.2.4.1 and 2.2.4.2.)
Deregistration official	Reassigns primary account sponsor	Web Sponsor (see Section 2.3)
Primary and alternate account sponsors	Assigns/reassigns, removes <ul style="list-style-type: none"> • alternate sponsors • security coordinators • billing coordinators 	Web Sponsor
Primary account sponsor	Reassigns primary sponsor	Web Sponsor

2.2 REGISTRATION FOR SERVICES

You must be a registered user to take advantage of the services provided by Titan. Registration certifies that the user has an operating program requirement and funds with which to reimburse CIT for services received.

New users are welcome at the NIH Data Center. If you are interested in becoming a user but have questions, the NIH Help Desk consultants will be glad to refer you to an appropriate staff member.

If There Is an Existing Account

If an account already exists for your organization, the account sponsor for the organization can simply add new users to that account through Web Sponsor. (See Section 2.3.) The

account sponsor authorizes the use of resources and services at CIT and can add users to the account.

If This Is a New Account

To initiate a new account, a person with authority to obligate funds must complete a CIT Account Request form for the organization. If the sponsoring organization is outside of NIH, an Interagency Agreement must also be submitted. See Section 2.2.4 for more information about the forms. For registration information for CIT systems and services, as well as downloadable forms, go to:

<http://ithelpdesk.nih.gov/accounts>

The forms must be faxed or sent to CIT. After receiving the appropriate forms, CIT will establish an account code for the user organization. Account codes are unique codes used to identify the recipient of services. Once the account is set up, the account sponsor can register additional users for the organization through Web Sponsor. Visit:

<http://websponsor.cit.nih.gov>

Once a New User Is Registered

After completing the registration process, the account sponsor receives a unique userid and a temporary password to give to the new user. The user should immediately change the password to ensure further security.

Resetting Passwords

Account sponsors, security coordinators, and deregistration officials can reset the passwords for users under their account through Web Sponsor (see Section 2.3).

Users can change their own passwords through Web RACF (see Section 4.6.4). If the users are associated with NIH, they can reset their Titan passwords using the Password Reset facility, which is accessed through their NIH Login (user name and password). Go to:

<http://silk.nih.gov/passwordset>

Output Box Numbers

When account sponsors register new users, they also assign output box numbers for the userid. If the account sponsor does not assign an output box number, the default is NOBX. Users can set or change their output box numbers using Customer Locator. For information on output boxes, see Section 5.6.1.

Registration Data

Account sponsors must maintain close surveillance of user registration data for their organizations. Current information (e.g., telephone number, address) on each user must be available to fulfill security requirements and to permit CIT to contact users directly. Account sponsors monitor the account through Web Sponsor. For more information on Web Sponsor, see Section 2.3. For additional information, contact the NIH Help Desk. See Section 5.2.1.

2.2.1 Account Sponsors

Each user organization must appoint an account sponsor as the primary point of contact between the users and the NIH Data Center. The name of the account sponsor must be specified in the CIT Account Request form.

How to identify your account sponsor

To find the name of an account sponsor for a specific account, use the Customer Locator (see Section 1.3.2.2).

- Go to:
<http://silk.nih.gov/locator>
- Select your Institute or Center from the Account Sponsors and Alternates list.
- Click the Display button. This will display all the Account Sponsors for your Institute or Center. You may be able to identify the appropriate person from the list.

Otherwise, talk to your supervisor or co-worker, or call the NIH Help Desk for assistance.

Responsibilities of Account Sponsors

Account sponsors and their designated alternates play a vital role in the success of the computer applications that are run at the NIH Data Center. Because of this, each sponsor should designate at least one alternate to accept responsibility in the sponsor's absence. Sponsors and alternates must be government employees. They have full responsibility for their computer accounts.

Account sponsors must ensure that all computer applications directly relate to the official government business defined in the request for use of the NIH Data Center, and that all work adheres to the Center's published standards and procedures. They can reset passwords and have all of the other security authorities of the security coordinator (see Section 4.5).

Account sponsors can refer to the manual *Procedures for Deregistration Officials and Account Sponsors*, available through the CIT publication ordering service (see Section 5.4).

The account sponsor and the alternate should have some understanding of NIH Data Center operations. Sponsors are urged to take advantage of the wide variety of services described in this manual. There are extensive training opportunities offered by the CIT Computer Training Program (described in Section 5.3). CIT provides documentation via the CIT publication service (see Section 5.4).

Account sponsors use Web Sponsor to perform account and userid changes interactively. For more information on Web Sponsor and the functions that account sponsors can perform, see Section 2.3.

The specific responsibilities include the following:

- oversee the appropriate use of an account
- add/remove users for an account
- reassign userids within the account
- authorize/remove/transfer customers for CIT services (e.g., Helix, remote access, etc.)
- close accounts
- change the account title or CAN (Common Accounting Number)
- change customer information
- employ the security authorities of the security coordinator (see Section 4.5). This includes resetting passwords, revoking/resuming RACF access, and changing the password expiration date.
- access billing data
- add, change, or remove:
 - alternate account sponsors
 - primary and alternate security coordinators and billing coordinators
- perform data functions (when removing userids from account)
- deregister users from DB2
- register and remove users from Model 204
- add, change, or remove alternative sponsors, billing coordinators, security coordinators
- delete user data sets (DASD, tape)
- **primary sponsors only:**
 - designate a new primary sponsor

CIT wants to know of any problems encountered by account sponsors and would like to hear about their concerns. Submit an IT Service Request to communicate user problems, and to apply for refunds. See Section 5.2.2 for further information. Occasionally CIT will have to contact an account sponsor in order to update information or to discuss a problem concerning the use of an account.

The NIH Help Desk (see Section 5.2.1) serves as the central point of contact for all CIT accounts and welcomes inquiries from sponsors concerning administrative procedures.

2.2.2 Accounts

Accounts identify the customer organizational unit responsible for reimbursing CIT for the charges that will be incurred. All accounts on Titan are defined as RACF groups and the userids and RACFids assigned to an account are members of that RACF group. (See Section 4.6 for information on RACF.)

2.2.3 Userids

Userids are required for accessing system services such as batch jobs, interactive and database systems, and RACF. A userid identifies a particular registered user of a system. The userid does the following:

- validates an individual signing on to the system (like the TSOid)
- acts as the high-level qualifier for user-owned data sets
- identifies whether a user is permitted access to data (like the RACFid)
- must be associated with an output box number (NONE is a valid value for a box); see Section 5.6.1 for more information.
- **should not be shared.** All users must have their own userid.

If a user causes systems problems and cannot be located by CIT staff, the userid will be deactivated until the staff can contact the user.

Characteristics of Titan Userids

- Titan userids may be from 2 to 8 characters long, with the first character an alphabetic letter or a \$.
 - TSOids are limited to 7 characters in length. Userids of 8 characters cannot log on to TSO.
 - In order to avoid problems, users who expect to develop applications that use UNIX System Services should not have userids that include a \$. In particular, data set names incorporating a \$ are treated differently under UNIX Systems Services.
- Each userid is associated with one, and only one, account.
- The userid, TSOid¹, and RACFid are identical.
- User-owned data sets must begin with either the userid—with the form *userid.name* (e.g., johndoe.dataname)—or with the account (e.g., *aaaa.dataname* or *aaa.dataname*). For information on data set naming conventions, see Section 10.

¹TSOids are limited to 7 characters in length. userids of 8 characters cannot logon to TSO.

Figure 2-2. Format for Titan Identifications

Titan Identification	Format
userid	From 2 to 8 alphanumeric characters
account	3 or 4 alphanumeric characters (e.g., aaa or aaaa)
RACFid	Same as userid
TSOid	Same as userid
RACF group	Same as account
dsname	userid.dataname or account.dataname

2.2.3.1 Userids with Non-expiring Passwords

In some cases, it may be necessary to have userids associated with passwords that do not expire. The most common examples are for batch jobs that are submitted automatically with embedded passwords, or for web or database access from a middle tier application that connects via a predetermined userid and password. An account sponsor can add a new customer (userid) through Web Sponsor and specify, "Never expire" for the password. However, that userid will not be allowed to sign on to the interactive TSO facility. Userids with non-expiring passwords should be used only when absolutely necessary.

These userids have the following characteristics:

- Batch, web, and database access is permitted.
- They can be used to create data sets.
- Their associated passwords do not automatically expire after 60 days.
- They cannot be used to log on to TSO.

2.2.3.2 Titan Userids for Remote Access Authorization

If a user requires remote access to the NIHnet through Parachute or VPN and does not have a Titan userid, a special userid will be created when the account sponsor requests remote access service through Web Sponsor.

These userids have the following characteristics:

- They contain 8 characters—beginning with the letter "R" followed by 7 numbers derived from the user's NIH ID.
- The "R" userids are linked to the user's NIH Login user name.
- They do not have associated passwords.
- Their only function is to be part of the authorization process for users who require remote access accounts.

-
- They **cannot** be used to log on to any system, submit batch jobs, or access web sites that require a Titan userid (e.g., a SILK web site)

2.2.3.3 Inactive Userids

Inactive userids are deregistered on an annual basis. A userid is considered inactive if all of these conditions are met:

- The userid has **not** had any charges against it based on its activity within the last two years.
- The userid is **not** a VPN or Parachute user.
- The userid does **not** belong to an account official.
- The userid has **not** logged into any system (such as SILK) that requires entering a Titan password.
- The userid was created more than 2 months ago and no one has ever logged on using it.

If you have any questions about the policy or the process, contact the NIH Help Desk.

2.2.4 Account Authorization Forms

To download the forms required to set up a CIT Titan account, go to:

<http://ithelpdesk.nih.gov/accounts>

Scroll down and click on Forms. Next, select the appropriate form. There is an account request form for NIH customers (see Section 2.2.4.1) and a separate account request form (interagency agreement) for non-NIH customers (see Section 2.2.4.2).

2.2.4.1 CIT Account Request for NIH Customers

Anyone within NIH who wishes to open a CIT account that includes Titan access must fax or mail the NIH customer form to CIT. Although anyone can request an account, the authorizing official who signs the form must have the appropriate authority within the Institute or Center (IC). The requestor should be able to answer questions that CIT may have about the information on the form. To authorize additional users on an account, account sponsors must use Web Sponsor (see Section 2.3).

2.2.4.2 CIT Account Request for Non-NIH Customers

Government organizations outside the National Institutes of Health may obtain CIT services, including access to Titan, through an interagency agreement. Organizations should fax or mail the non-NIH customer form to CIT. Although anyone can request an account, the authorizing official who signs the form must have the appropriate authority within the government agency. The requestor should be able to answer questions that CIT may have about the information on the form. To authorize additional users on an account, account sponsors must use Web Sponsor (see Section 2.3).

2.2.4.3 Annual Renewal of Interagency Agreement

Near the end of the fiscal year, CIT sends out a CIT Annual Renewal of Interagency Agreement form to each non-NIH organization using its services. This form must be completed and then faxed or mailed to CIT.

2.2.4.4 Deregistration Official Authorization

The Executive Officer (for NIH customers) or responsible agency official (for non-NIH users from HHS and other federal government agencies) must complete and sign the Deregistration Official Authorization for CIT Accounts form to assign or change the deregistration official or alternate deregistration official for CIT accounts. This form must be faxed or mailed to CIT.

2.3 WEB SPONSOR

Web Sponsor is an automated account management tool written by, and supported by, CIT. Web Sponsor facilitates account management procedures for the account sponsors, as well as deregistration officials. Web Sponsor supplies deregistration officials and account sponsors with all the necessary information needed to properly administer their accounts.

Web Sponsor allows deregistration officials and account sponsors to display information about a specific account, all accounts, or all accounts under a specific common account number (CAN). Sponsors and deregistration officials can also reset RACF passwords online, averting the faxing of requests to the security investigators. Passwords that are changed via Web Sponsor are automatically set to expire.

Billing coordinators and security coordinators for an account (see Section 2.1) can also access some functions of Web Sponsor. However, Web Sponsor will only let account officials do what they are allowed to do based on their role—sponsor, deregistration official, billing coordinator, or security coordinator.

2.3.1 Web Sponsor Functions

Web Sponsor functions are as follows:

CUSTOMERS

- Add New Customer to an Account

Note: When adding a new customer the account sponsor requests a userid, specifies the default level of data set access, and selects the password expiration period.

- Transfer Userid to a New Account
- Remove Userid

Note: A userid cannot be removed until all the resources associated with that userid are deleted. When a sponsor chooses this option, Web Sponsor helps the account sponsor perform functions that include deleting cataloged data sets, removing RACF profiles, scratching migrated data sets, deleting DB2 objects, and removing the web-based Job Scheduler entries. After all the resources are removed, the account sponsor can delete the userid.

- Change Customer Information

Note: This includes updating names, addresses, output box numbers, and telephone numbers for users on their accounts. Users who are affiliated with NIH, should make these changes via the NIH Enterprise Directory (NED) interface (<http://ned.nih.gov>). See Section 1.3.2.1. Be aware that changes made directly through Web Sponsor will **not** be propagated to the NED, but changes made through the NED are propagated to Web Sponsor.

Account sponsors can use Web Sponsor to associate a user's Titan userid(s) with the user's NIH (NED) ID. That way all changes to the NED will carry over to Web Sponsor.

- Add Comment to Userid

Note: In some cases, a Titan Userid may be assigned to a person for a specific reason. This function allows sponsors to document that reason for future reference.

- Request Additional Userid for Existing Customer
- Reassign Userid to Existing Customer
- Reassign Userid to New Customer
- Request Model 204 ID
- Remove Model 204 ID

Display

- Customer Information
- Data Set Names
- DB2 Objects

-
- Resource Matrix (Web Sponsor displays the type of resources owned by the userid for the specified account as of 02:00 am the previous morning. These resources include data sets, tapes, Parachute/VPN authorization, Helix accounts, and Model 204 IDs.)
 - Customer Log (Web Sponsor displays the number of data sets, number of tapes, and the Model 204 ID, if there is one, for each userid valid for the account, or for the specified userid.)

Security

- Change Titan Password

Note: Users with an NIH ID badge number can reset their Titan passwords directly, rather than going through their sponsors. The requestor is validated for the specified userid based on their NIH Login user name, domain, and NIH Login password. Go to the Password Reset facility at:

<http://silk.nih.gov/passwordset>

- Restore Userid
- Revoke Userid
- Change Titan Password Expiration
- **Note:** This includes resetting passwords that were restricted under the former South System to access only certain CIT services. To allow these userids to access TSO, select the Change Password Expiration link and choose “Expire after 60 days.”

Helix

- Request Password Change

Note: Users with an NIH ID badge number can request a reset of their Helix, passwords directly, based on their NIH Login user name, domain, and NIH Login password. Go to the Password Reset facility at:

<http://silk.nih.gov/passwordset>

- Registration
- Deregistration

Remote Access

Note: A user must have an NIH Login user name associated with a Titan userid before a sponsor can request a Parachute or VPN account for that user. For information on the NIH Login and the NED, see Section 1.3.2.1. For more information on Remote Access, see Section 6.1.3.

- Parachute Requests
- VPN Requests

ACCOUNTS

- New Account and Deregistration Forms
- Close Account

-
- Change Account
 - Change Primary Sponsor
 - Add Account Official
 - Remove Account Official

Display

- Account Log
- Customer Information
- Account Official Information
- NIH Remote Access Information
- Model 204 Information
- Helix Information
- Resource Matrix
- Titan Password Activity Dates

NIH nVision Data Warehouse

- CIT Billing Reports
- nVision Data Warehouse Registration

MISCELLANEOUS

- Add Web Sponsor to your NIH Portal Page
- Web Sponsor Documentation
- Submit Comment

Most actions through Web Sponsor are effective immediately.

2.3.2 Access to Web Sponsor

There are several ways to access Web Sponsor.

Web Sponsor Access Via the Titan Userid

To use Web Sponsor, go to:

<http://websponsor.cit.nih.gov>

RACF security protects all Titan system data from unauthorized access. The first time the Web Sponsor page is accessed from a web browser, a security “pop-up” window prompts for a userid and password. Only account sponsors with valid userids and passwords will be

allowed to display and change data for their accounts. Account officials who have multiple Titan userids for a single account should designate one userid for use with Web Sponsor.

Web Sponsor Access Via NIH Login

Account officials associated with NIH can access Web Sponsor via the NIH Login. They are prompted for their NIH Login user name and password rather than their Titan userid and password. The NIH Login will then find the associated Titan userid. If an account official has more than one userid that is valid as an account official, a drop-down menu will offer a choice of userids to use. Go to:

<http://websponsor.cit.nih.gov/nihlogin>

Authentication via NIH Login will fail if your NIH ID has not been added to your Web Sponsor customer record. To remedy this, log in to Web Sponsor, click on Change Customer Information under “Customers.” On the next page, specify your userid or name. Complete your customer record and click “Submit Request.” Once your customer record has been updated, you can access Web Sponsor via the NIH Login.

Web Sponsor Via the NIH Portal

Account officials who have personalized a my.nih.gov web page can access Web Sponsor through the NIH Portal. To add the "Launch Web Sponsor" portlet to a NIH Portal page (my.nih.gov), do one of the following:

- From the Web Sponsor home page, select “Add Web Sponsor to your NIH Portal Page”
- Or,
- Go to:

<http://my.nih.gov>

Log in with your NIH user name and password. Click on the online help at the top of the page and follow the instructions for adding portlets.

For More Information

For more information on Web Sponsor features, including access via the NIH Login and the NIH Portal, go to:

<http://silk.nih.gov/silk/sponsorinfo>

2.4 DEREGISTRATION FROM SERVICES

The NIH Data Center has procedures in place for preventing unauthorized users (e.g., employees who leave their IC or government agency) from accessing CIT computer systems. Denying access to employees and contractors who have left the IC is a good management practice: it prevents unauthorized access to IC data, and the resulting potential resource cleanup can save IC funds by avoiding unnecessary computer charges.

2.4.1 Deregistration Officials

Deregistration officials are responsible for ensuring that users who are no longer authorized to incur charges have their access/authorities removed from NIH systems. These account officials have the ultimate responsibility for ensuring that access to CIT computing services, including financial systems (e.g., databases on the mainframe system), is denied when an employee resigns or is transferred to another IC or government agency.

Deregistration officials work with account sponsors on the deregistration process. “Clean-up work,” (e.g., getting rid of data sets, removing databases, releasing tapes, etc.) is done solely by the sponsors (see Section 2.4.2). **Note:** The deregistration official can be the same person as the account sponsor.

The following policies apply to deregistration officials and alternates:

- They are appointed by the NIH IC (Institute, Center) Executive Officer or by the responsible agency official (for non-NIH accounts).
- Since deregistration officials are responsible for some issues regarding funds, security, and privacy with respect to the NIH Data Center, they must always be government employees.
- There must be an alternate deregistration official who can carry out these functions if the primary is not available.
- Only one primary and alternate deregistration official are permitted for each account, and each must be a registered user of the NIH Data Center.

The deregistration official has the following responsibilities:

- initials paperwork for new accounts, indicating receipt, thereby ensuring that each account has a deregistration official
- uses Web Sponsor to carry out many functions (see Section 2.3)
- oversees the deregistration of users from their account(s)
- resets RACF passwords when users leave the IC or agency
- **primary deregistration official only:**
 - adds, changes, or removes account sponsors, including selecting a new primary account sponsor

(**Note:** when a new account is opened, the name of the account sponsor must be specified on the CIT Account Request form)

Deregistration officials use Web Sponsor to carry out many of their functions. See Section 2.3.

For more information, refer to the manual *Procedures for Deregistration Officials and Account Sponsors*, available from the CIT publication ordering service (see Section 5.4).

2.4.2 Terminating Use of Services

Account sponsors use Web Sponsor to help close an account or to remove a user from an account. If users leave and their NIH IDs have been included in the Web Sponsor database, Web Sponsor sends e-mail to the account sponsors and deregistration officials for those accounts. Based on these e-mails, account officials can then determine when a userid must be removed or transferred to another user. (See Section 2.3.1, under “Change Customer Information.”)

Closing an account or removing a user from an account can only take place after meeting all of the requirements listed below:

- The account sponsor ensures that all computing resource usage has ceased.
- The userid no longer owns data sets or tapes.
 - Data sets and tapes that contain important or useful data are transferred to another userid.
 - All unneeded data sets are scratched and unneeded tapes released.

The specific steps required to reassign/release data and resources are listed below. Many of these steps can be accomplished through Web Sponsor (see Section 2.3), as indicated.

- Reassign data sets by renaming them using another valid userid. This places the data sets under the control of another user.
- An alternative is to reassign the userid to an existing user (Web Sponsor). When using these two methods (reassigning the data sets or reassigning the userids), the account sponsor should ensure that the resources used by the reassigned userids are closely monitored.
 - Account sponsors should be sure to reset the passwords (Web Sponsor) for userids that will be reassigned and not deleted.
- Reassign ownership of tapes. To do this you must copy the entire tape. Change the data set name of at least the first data set on the tape so that it begins with the userid of the new owner.
- Cancel subscriptions to Internet Listserv lists.

-
- Remove the userid when the cleanup is complete (Web Sponsor).

A userid cannot be removed until all the resources associated with that userid are deleted. When a sponsor chooses this option, Web Sponsor helps the account sponsor perform functions such as:

- deleting cataloged data sets
- removing RACF profiles
- scratching migrated data sets
- deleting DB2 objects
- removing the web-based Job Scheduler entries

After all the resources are removed, the account sponsor can delete the userid.

- If an account must be closed, first remove each userid in the account. Once the cleanup is complete, use Web Sponsor to close the account.

Contact the NIH Help Desk if there are any questions concerning the reassignment of userids or the deregistration procedure.

3 CHARGING

A schedule of rates governing the various kinds of services offered by CIT has been established under the NIH Service and Supply Fund (Revolving Fund). The schedule of rates for the various services offered by Titan is available in Section 3.1. For billing purposes, every request for service identifies the user by the Titan userid described in Section 2.2.3. This code must be used on all requests for services. CIT billing practices are described in Section 3.2. For refund information, see Section 3.2.2.

Section 3.1 contains the rates as of the publishing date for this manual. Occasionally CIT must make adjustments to the rate structure during the year.

For the most current rates for Titan and additional NIH Data Center services, go to:

<http://cit.nih.gov/ProductsAndServices/ApplicationHosting/DataCenterRates.htm>

3.1 CHARGING FOR INDIVIDUAL SERVICES

The rates for the current fiscal year are shown in Figure 3-1. **Note:** CPU seconds refer to an IBM z9-BC (2096-M03) processor.

Figure 3-1 Titan Charges

Service	FY 2009 Rate
Processing *	
Batch CPU (per CPU second) **	\$ 2.47
Batch I/O (SIO) (per 1,000)	\$.0206
Interactive CPU (per CPU second) **	\$ 2.85
Interactive I/O (SIO) (per 1,000)	\$.0206
<i>* Model 204 CPU and I/O charges are computed at either the batch or interactive rate, as appropriate. IMS CPU charges are computed at the interactive rate.</i>	
<i>** For information on discount processing during certain time periods, see Section 3.1.1.</i>	
DB2 Processing	
Up to 1.70 CPU seconds (per CPU second)	\$ 1.81
1.71 to 4.26 CPU seconds (per CPU second)	\$ 1.33
4.27 to 34.10 CPU seconds (per CPU second)	\$.61
Over 34.10 CPU seconds (per CPU second)	\$.30

Service	FY 2009 Rate
SILK/Shadow Direct Processing	
Up to 1.70 CPU seconds (per CPU second)	\$ 2.85
1.71 to 4.26 CPU seconds (per CPU second)	\$ 2.61
4.27 to 34.10 CPU seconds (per CPU second)	\$ 1.21
Over 34.10 CPU seconds (per CPU second)	\$.61
IMS Processing (per ENTER keystroke)	\$.05
Disk	
Storage (per megabyte, per day)	\$.0103
Backup (per megabyte, per day)	\$.0003
Dedicated disk (per month)	\$ 2,112.00
Tape	
Tape mount	\$.52
Library storage (per tape, per day)	\$.0361
Tape handling for exporting tapes	\$ 12.00
Tape shipping for exporting tapes	\$ 10.00
Printing	
Standard (per image)	\$.0618
Labels (per 1,000 lines)	\$ 1.1845
MISCELLANEOUS SERVICES	
Central Printing (LAN Initiated)	
Per image	\$.0680
Disaster Recovery (Per Application, Per Month)	\$ 808.00
SILK Web (Per Customized Server, Per Month)	
Basic (up to 10 MB storage, 500 MB data transfer)	
Server charge	\$ 61.80
Password protection	\$ 10.30
Secure sockets layer (SSL)	\$ 20.60
Intermediate (up to 25 MB storage, 1000 MB data transfer)	
Server charge	\$ 103.00
Password protection	\$ 15.45
Secure sockets layer (SSL)	\$ 36.05
Advanced (up to 50 MB storage, 2000 MB data transfer)	
Server charge	\$ 206.00

Service	FY 2009 Rate
Password protection	\$ 20.60
Secure sockets layer (SSL)	\$ 51.50
SILK Web (Public and Secure Servers, Per Month)	
Unlimited number of web pages (“@WWW” data sets) stored under a userid plus normal data set charges	\$ 20.60

3.1.1 Discount Processing

Discount service offers a 50% discount to interactive and batch CPU processing between the hours of 5:00 P.M. and 7:00 A.M. Monday through Friday and all sessions that occur entirely on weekends. Federal holidays are treated the same as weekdays.

There is no discount for tape mounting or central printing.

To request batch processing during the discount period, add the following control statement:

```
/*DISCOUNT
```

after the JOB statement. Even if a job does not include a /*DISCOUNT statement, any job that begins execution during the discount period will receive the discount rate.

For more information on job control language, refer to the *Titan Batch Processing* manual. See Section 5.4 for ordering information.

3.2 BILLING

Each month, CIT prepares a summary of charges that is available through the web for the organization’s billing coordinator and account sponsor. The online invoice shows charges for the previous billing period as well as the total charges for the fiscal year for Titan-based services and other miscellaneous services. A billing period covers actions from the 19th day of the previous month to the 18th day of the current month.

Monthly invoices list charges by rate group. A rate group is a CIT chargeable service composed of one or more chargeable entities. For example, the Titan Batch Processing rate group includes prime time CPU time, discount period CPU time, and number of I/Os for all batch jobs submitted by an account for a particular billing period.

Billing information is available through Web Sponsor and the nVision Data Warehouse Community of the NIH Portal.

Web Sponsor

Account sponsors and billing coordinators can use the CIT Billing Reports link in Web Sponsor (click on Accounts) to view CIT charges for their account and for the individual users under their account. Using Web Sponsor, the account official can review the following reports:

- Invoice Reports – Displays a web browser version of the printer invoice by account/initials.
- Detailed Billing Reports – Provides month-to-date and any previous month summary information, month-to-date and previous months detailed transaction listings, and detailed dataset charge information by account or userid. Because of the amount of data to be retrieved, generation of these reports can take several minutes to run.
- Billing -- Queries and Reports – Accesses the nVision CIT Billing Queries & Reports facility described below

See Section 2.3.2 for information on how to access Web Sponsor.

nVision Data Warehouse Community

Account sponsors, billing coordinators, and Data Warehouse Budget & Finance registered users can use the CIT Billing Queries & Reports facility, available through the nVision Community. Go to the NIH Portal (<http://my.nih.gov>), and select the nVision community.

1. On the left side of the page, click on Launch Reports.
2. On the left side of the resulting page, click on the plus signs to open these folders in order:
 - Public Folders
 - Business Areas
 - Budget & Finance
3. Within the Budget & Finance folder, click on the Applications folder.
4. CIT Billing appears as one of the options within the Applications folder. Click on it to open up the CIT Billing Sign In screen.

Note: You must register for each business area to run actual reports.

Batch Job Charges

Users who submit batch jobs can look at their output for the estimated cost for each job step. A sample of job output is included in the manual *Titan Batch Processing*.

3.2.1 Billing Coordinators

Each organization using Titan must have a billing coordinator, (usually a financial officer) assigned by the account sponsor. The billing coordinator deals with the financial aspects of an account. This official may be a contractor.

There must be one primary billing coordinator and any number of alternates. The billing coordinator:

- receives invoices (primary billing coordinator only) for appropriate accounts
- accesses billing data through the methods described in Section 3.2

3.2.2 Refund Policy

If you think that you have been overcharged for Titan services, you can apply for a refund and CIT will investigate your charges. CIT will give refunds for jobs that fail due to the following reasons:

- hardware failure
- failure due to NIH Data Center-supported software
- operational errors

There are no refunds for:

- jobs aborting due to user's application program failure
- I/O errors caused by defective foreign tapes
- errors occurring or jobs aborting as a result of the user violating instructions or restrictions as stated in the *Titan User's Guide* and *Titan Batch Processing*

This also includes errors occurring or jobs aborting as a result of exceeding job limits or failing to follow vendor reference manuals and warnings.

Obtaining Refunds

To request a refund for a run that has aborted due to an error/problem with NIH Data Center services, the user should:

- Contact the NIH Help Desk by submitting an IT Service Request (see Section 5.2.2).
- Submit all supporting documentation (i.e., source listing, dumps, and terminal listings) to the NIH Help Desk.
- Preserve unchanged, all the evidence related to the problem.

CIT will review the request and contact the user (by telephone or e-mail) to report whether the request for a refund has been approved or denied. If a refund is not justified, the staff member will provide the user with an explanation.

If a refund is approved, the appropriate amount will be credited to the user's account and will appear as a credit on their monthly statement. Because of the processing overhead, refunds

for services amounting to less than \$10.00 will not be credited, however you can accumulate requests for refunds related to batch charges until they total \$10.00 or more.

3.3 CONTROLLING COSTS

CIT wishes to help users make efficient and effective use of its facilities. This section includes suggestions to control information processing costs. See Section 3.2 for information on billing.

Batch Processing

In addition to the hints below, the documentation for individual programming languages and procedures often contains additional cost-saving recommendations. To reduce the costs of batch processing try the following:

- Run batch jobs overnight or during weekends to obtain dramatic savings. Refer to Section 3.1.
- Reduce the number of tape mounts required by some jobs.
- If a tape will be used more than once in a step or in multiple steps, proper JCL can minimize the number of times the tape must be mounted, and therefore, the corresponding tape mount charges. Use the JCL subparameter RETAIN in the VOLUME parameter and the PASS subparameter of the DISP parameter to ensure, where possible, that a tape remains mounted during and between steps.
- Execute a fully or partially resolved load module for programs that are run repeatedly rather than compiling the program each time. For COBOL, FORTRAN, and PL/I, compiler optimization options can provide additional savings.
- Reblock your files to reduce I/O costs. Small blocksizes increase I/O counts.

Interactive Sessions

As with batch processing, an effective way to save money is to use the system during the discount period.

Storage

- Cut costs by storing data economically. Data sets that are no longer of value should be scratched.
- Condense partitioned data sets (PDSs) using the RELEASE option with the space allocation.
- Use the NOBACKUP management class for data sets that do not require data center backup.
- Examine tape usage to determine if some data should be stored on disk. The convenience, automatic backup, and low disk charges often make disk an attractive alternative to tape.

4 SECURITY AND DISASTER RECOVERY

The NIH Data Center provides a secure computing environment, suitable for hosting critical applications and data categorized at the low or moderate security level per FIPS (Federal Information Processing Standard) Publication 199, Standards for Security Categorization of Federal Information and Information System for NIH and other government agencies.

Appendix III to OMB Circular A-130 states: “The Appendix requires the establishment of security controls in all general support systems, under the presumption that all contain some sensitive information, and focuses extra security controls on a limited number of particularly high-risk or major applications.” CIT, as a provider of general support systems, manages and configures all host systems in conformance with the following laws, regulations, and policies to provide the appropriate protection controls for hosting customer data and applications that are determined to be rated moderate-risk or major applications:

- Public Law 93-579, U.S. Code 532(a), the Privacy Act (1974), requires the U.S. Government to safeguard personal data processed by federal agency computer systems. It also requires the government to provide ways for individuals to find out what personal information is being recorded and to correct inaccurate information.
- OMB Circular A-130, Management of Federal Information Resources (1985), establishes requirements for effective and efficient management of federal information resources. Appendix III, Security of Federal Automated Information Resources, establishes the requirements for agency security programs to safeguard the sensitive information they process.
- Public Law 100-235, the Computer Security Act (1987) requires every U.S. government agency that processes sensitive information to have a customized computer security plan for the system’s management and use. It also requires that all U.S. government employees, contractors, and others who directly affect federal programs undergo ongoing periodic training in computer security.
- Federal Information Security Management Act of 2002 (FISMA), enacted as part of PL 107-347, the E-Government Act of 2002; codifies the security requirements contained in Appendix III of OMB Circular A-130. In addition, it requires agency Inspector Generals to conduct independent audits of agency information security programs, through testing security controls on a subset of agency systems, and to report the results to the OMB, which in turn reports the findings to Congress.
- Department of Health and Human Services policies and guidelines
- NIH data security policies and guidelines published on the NIH intranet

Significant security controls for Titan

Security controls for Titan include:

- restrictions on physical access to the facility housing the CIT enterprise systems (physical security). See Section 4.1.
- policies and procedures for ensuring that only authorized individuals are granted access to Titan (user registration). See Section 2.2.
- policies and procedures for authenticating users before granting access to Titan (passwords). See Section 4.6.1.
- procedures for ensuring tapes and printed output are appropriately protected (input and output controls). See Section 4.2.
- procedures for ensuring security violations are handled and resolved in a timely manner (security violation monitoring). See Section 4.3.
- a program for ensuring the continuation of operations following an event that causes an extended disruption of enterprise systems operations (disaster recovery). See Section 4.4.
- technical controls for protecting data sets—Resource Access Control Facility (RACF). See Section 4.6.
- annual SAS 70 audits of enterprise systems processing data and applications to ensure that the security controls remain effective to protect those data and applications. (Titan has SAS 70 Type II validation.)
- periodic risk assessments, penetration testing
- formal security plans
- policies and procedures for users with remote access to NIHnet (e.g., Parachute and VPN). Go to:
<http://remoteaccess.nih.gov>
- change control procedures covering hardware and software upgrades and patches
- environmental controls and monitoring to ensure a stable Data Center climate. See Section 4.1.
- NIH backbone network (NIHnet) security provided by CIT. See Section 6.1.
- enhanced implementation of SSL via AT/TLS within the Communications Server. See Section 6.4.1.1.
- SSH (secure shell protocol) for UNIX System Services. See Section 6.4.3.
- built-in hardware and software encryption; all z microprocessors have the clear key encryption facility built-in.
- intrusion detection services built-in to the mainframe's Communications Server

While CIT is responsible for maintaining a secure operating environment on the enterprise systems, individual users are responsible for ensuring that their own data and applications are protected. CIT provides the necessary procedures and tools that enable users to fulfill their security responsibilities.

4.1 PHYSICAL SECURITY

Access to the entire NIH Bethesda campus, including the building 12 complex, is tightly controlled. Employees must present a Department of Health and Human Services (HHS) photo ID badge (for example, an NIH-issued ID badge). Visitors must obtain temporary visitors' badges at the NIH Gateway Center (at Metro) or the West Gateway Visitor Center. For current security procedures in effect at the NIH campus, go to:

<http://www.nih.gov/about/visitorsecurity.htm>

A security guard is stationed at the main entrance to the Data Center, 24 hours a day, seven days a week. Badge readers control all other external entrances and surveillance cameras monitor building access from multiple locations.

Machine Room Access

The CIT enterprise systems are all housed in the NIH building 12 complex machine room. Physical controls that restrict access to the machine room include:

- Badge readers and iris recognition systems are installed on all entrances to the machine room.
- Badge reader access privileges are only granted to individuals who require frequent and regular access to the computers in the machine room.
- Procedures are in place to annually certify the holders of machine room badge reader access privileges.
- Individuals, such as equipment repair persons, who must have unescorted access to the machine room, obtain temporary badges that allow access for a limited time.
- Everyone else must display an “Escort Required” badge and be accompanied by a person authorized for unescorted access to the machine room.

Environmental Controls and Fire Containment

The temperature and humidity in the machine room are strictly monitored and controlled for a non-stressed hardware environment.

The machine room is equipped with leak detectors, smoke detectors and an adequate number of fire extinguishers to contain small fires. The NIH building 12 complex has sufficient fire protection due to the rapid response by the NIH fire department.

UPS System

The machine room equipment is protected from surges or drops in power supply and power interruptions by an uninterruptible power supply (UPS) system. The UPS system is designed to provide all electrical services to the machine room area. When an interruption occurs, power is supplied by a battery backup system that provides over 20 minutes of operating capability. After being on batteries for 30 seconds, the diesel generators start up and provide more than 24 hours of operation per tank of fuel.

The UPS system has more than 50% excess capacity. Moreover, the batteries, monitoring and control equipment, and diesel generators are all configured in three redundant sections. Failure of any one section will result in no more than a one-third loss of capability, leaving more than adequate capacity to support all ongoing services until power is restored.

4.2 INPUT/OUTPUT CONTROLS

Tapes

CIT processes two categories of tapes:

- NIH-owned – These tapes are available for assignment to users for storing data and remain under the control of the tape inventory system.
- “foreign” (or “special”) –These tapes are owned and supplied by users and are not under the control of the tape inventory system. Foreign tapes are submitted to the Output Distribution Services counter in Building 12A. For additional information on foreign tapes, see Section 10.2.4.

RACF security protects the data stored on all NIH-owned tapes. Data on foreign tapes is not protected by RACF controls.

NIH-owned tapes may not be removed from the data center. Users may copy the information from a NIH tape to either a tape that they supply or to a tape from a pool of tapes available for purchase from NIH.

Printed Output

Printed output is placed in the locked boxes outside the machine room. Only users who know the correct box access code can access the boxes. See Section 5.6.1 for further details on the locked boxes.

Users have the option of printing “PRIVATE” on the header and trailer pages of the printed output containing sensitive information.

4.3 SECURITY VIOLATIONS

CIT monitors the security status of Titan and takes immediate action if there is an apparent breach of security. Userids related to any security violation are automatically revoked.

The NIH Data Center security investigators send e-mail to the security coordinator/account sponsor or alternate for the account in question. The e-mail details the specific circumstances of the violation. The security coordinator is responsible for investigating and resolving the apparent violation. When satisfied that no improper use of the account occurred, the security coordinator or account sponsor can reactivate the userid through Web Sponsor. No further communication with the NIH investigators is required unless the investigation indicated a security breach did, in fact, occur.

The NIH security investigators are available to assist with any aspect of the investigation. They may be reached by calling the NIH Help Desk.

If users discover apparent breaches of security, such as discovering that an unknown person may have used their userid, they should immediately notify their security coordinator or account sponsor. For general security questions contact the DCSS Security Coordinator.

4.4 DISASTER RECOVERY

With today's near total dependence on automated information systems to support critical organizational functions, interruption of those services could have severe consequences. Without adequate planning, an organization will have a difficult time recovering from an event that causes a long-term interruption to information system services.

CIT has a disaster recovery program to provide a foundation for users' disaster recovery planning. The CIT disaster recovery program covers Titan and hosted Unix (EOS). CIT charges for participation in the disaster recovery program (see Section 3.1). Charges for those applications that require additional hardware at the hot site or other heightened levels of support will be individually determined.

Account sponsors must enroll their applications in the disaster recovery program for their applications to be covered during a prolonged interruption to services. Contact the Disaster Recovery (DR) Coordinator to participate or to answer any questions regarding the program. See Section 1.3.1 for the telephone listing.

Features of the disaster recovery program include:

- Every week, CIT creates full volume backups of all Titan volumes, all database volumes, all private volumes, and all public volumes used for permanent data storage. These weekly dumps are written simultaneously to two separate automated tape libraries (ATLs); one located in the NIH Data Center and the second, located over 30 miles from the NIH campus. Both backups are cycled through six sets of tapes so that six successive weeks worth of backups are always maintained.
- Incremental backups of all changed data sets are taken daily for public and systems disk storage. Up to five unique backup versions per data set name are maintained. The incremental backups are written simultaneously to the two ATLs. In a disaster situation, all usable tapes will be sent to the hot site.

-
- CIT has a contract with a commercial vendor to provide sufficient computer services to support the participating applications at a fully operational data center, a *hot site*, with the required connectivity, if and when a disaster causes an extended interruption to computer services.
 - CIT schedules and conducts twice-yearly tests of the disaster recovery plan. Testing occurs over a two-day period with the first day dedicated to testing system recovery procedures and the second day set aside for customers to test their recovery procedures.
 - Participants in the program receive on-going customer support for disaster recovery planning and hot-site preparation.

In the event of a disaster that requires CIT to move operations to the hot site, CIT will restore the applications and data for the participating applications. There is no guarantee that other applications will be serviced following a disaster.

For more information on the CIT disaster recovery program, including a link to the documentation, visit:

<http://cit.nih.gov/ProductsAndServices/ApplicationHosting/DisasterRecovery.htm>

4.5 SECURITY COORDINATORS

Each user organization must have a security (RACF) coordinator. There must be one primary security coordinator and any number of alternates. This function belongs to the account sponsor until the sponsor designates a security coordinator. (See Section 2.1.) The security coordinator may be a contractor. The security coordinator carries out the following functions:

- serves as the point of contact for CIT security matters
- implements the account organization's password change policy
- performs RACF functions for users of an account
 - sets Titan passwords
 - revokes and resumes RACF access
 - changes Titan password expiration
- sets authorities for RACF account group
 - creates and maintains generic profiles
- requests password changes for Helix accounts

The security coordinator carries out many of these functions through Web Sponsor and Web RACF.

4.6 RESOURCE ACCESS CONTROL FACILITY (RACF)

Titan provides comprehensive data security through the Resource Access Control Facility (RACF). RACF is a security system that protects a data set by limiting who can access the data set and how it can be used (e.g., read, update). All data sets created at the NIH Data Center are automatically protected by RACF through the use of generic profiles.

RACF also controls logon and batch submission. The IBM OS Password Protection facility cannot be used at the NIH Data Center.

Each organization must assign a security coordinator. The security coordinator is responsible for the implementation standards of RACF within the agency. Users who need password assistance require access to resources that are not currently available to them, or have other similar RACF problems should contact their security coordinator. NIH Help Desk consultants cannot help the user in these situations. For additional information about security coordinators, see Section 4.5.

For More Information

The following sections of this manual provide information on how to use RACF. If you require additional assistance, contact the NIH Help Desk. (See Section 5.2.1.)

4.6.1 RACF Passwords

Each user is assigned a password when registered. This password allows access to Titan services. After you receive your initial password, be sure to reset it using Web RACF (see Section 4.6.4), Password Reset (see Section 4.6.1.1), or TSO (see Section 4.6.5). See Section 4.6.1.2 for general guidelines for choosing a password.

The password has the following characteristics:

- It must be 7 or 8 characters.
- The password must include at least one alphabetic character, at least one numeric character, and at least one special character.
- The special characters used in the password are limited to these: #, @, or \$.
- It cannot be the same as the Titan userid.
- RACF passwords expire every 60 days.
- When a RACF password expires, you may not reset it to any of your last 24 passwords.
- The password cannot be changed more than once a day.
- Titan does not distinguish between upper and lower case, therefore changing the case of an alphabetic character does not change the password.
- Users can change their passwords through Web RACF (see Section 4.6.4), TSO (see Section 4.6.5) or Password Reset (if they have an NIH ID badge number; see Section 4.6.1.1).

Users associated with NIH also have an NIH Login password. Although the requirements for a RACF password and the NIH Login password are similar, CIT strongly recommends that you do not make both passwords the same. This minimizes the chance that a compromised Windows password could be used to access Titan. Links to information related to the NIH Login passwords may be found at:

http://irm.cit.nih.gov/security/sec_policy.html#access

4.6.1.1 Resetting Forgotten Passwords

Users who forget their Titan (RACF) passwords will not be able to log on. Due to the design of RACF, it is impossible to determine the password for a userid; instead the password must be reset.

Using Web Sponsor

Account sponsors and security coordinators can reset forgotten passwords for users in their organization through Web Sponsor. **Note:** when the account sponsor or security coordinator resets the RACF password, that password is temporary and will expire automatically when the user tries to log on. The user must then reset the password through Web RACF. If you require further assistance concerning forgotten passwords, contact the NIH Help Desk. See Section 5.2.1. For general information about choosing passwords, see Section 4.

Using Password Reset

Users with an NIH Login user name and password can reset their Titan passwords using the Password Reset web page. Go to:

<http://silk.nih.gov/passwordset>

For more information on resetting forgotten passwords, go to:

<http://silk.nih.gov/silk/sponsorinfo>

Resetting Your NIH Login Password

If you are associated with NIH and you forget your NIH Login password, contact the NIH Help Desk. As an alternative to calling the NIH Help Desk, you can register for the CIT self-service password management tool, iForgotMyPW, which allows you to reset your NIH password or unlock your account yourself. You must pre-register for this service. Go to:

<http://iForgotMyPW.nih.gov>

and follow the instructions.

If you know your NIH password and would like to change it, go to:

<https://password.nih.gov>

4.6.1.2 General Password Tips

Passwords are the keys that allow access to the enterprise systems. Therefore, it is important to ensure that strong passwords (not easily guessed) are used and that passwords are protected from exposure to unauthorized individuals. See Section 4.6.1 for the specific requirements for RACF (Titan) passwords.

Users can help to ensure that passwords are not easily guessed by following these simple guidelines:

- Construct a mnemonic password; i.e., think of a phrase and use the first letter of each word to create the password.
- Devise passwords that include combinations of letters, numbers, and special characters, preferably embedding the numbers and special characters within the password, not at the beginning or end.
- Do not choose passwords that are the same as the login names (userids).
- Do not choose passwords with personal associations (e.g., names of relatives or pets, phone numbers, license plate numbers).
- Do not use repeated or obvious sequences (e.g., the same alphabetic character repeated 6 times, alphabetic run, keyboard sequence).

Users can help protect their passwords by following these procedures:

- Do not write down the password and leave it near your workstation.
- Do not divulge your password to any other individual. As a rule, CIT staff never request user passwords. Exceptions occur when the staff member may need to log on as the individual when all other avenues of problem resolution have been exhausted. If a staff member initiates a contact and requests a password, ask for the individual's name and call back through the NIH Help Desk before fulfilling the request. Be sure to change your password after the problem has been resolved.
- Use emulator software that supports either masking or suppressing the printing of the password as it is entered.
- Change your password more frequently than the required 60 days. Passwords can be changed using the Change RACF Password option of Web RACF at:

<http://titan.nih.gov/racf>

or through the Password Reset facility (see Section 4.6.1.1).

Users should be careful when entering their passwords. Repeated errors in attempting to supply a password are logged as a security violation. Excessive failed attempts will cause the

userid to be revoked (i.e., be unusable) until the security coordinator makes a formal response to the violation notification.

4.6.2 RACF Definitions

Users should be familiar with the following RACF terms in order to use the RACF facilities effectively:

RACFid	the Titan userid
PASSWORD	a protection for the RACFid. The password is a series of seven or eight characters, specified by the user. It must include at least one alphabetic character, at least one numeric character, and at least one special character (from the set #, @ or \$). Passwords expire automatically after being in use for 60 days; they can be changed through the Change RACF Password function of Web RACF. See 4.6.1 for all the rules concerning RACF passwords.
RACF GROUP	or RACF Account Group - is the same as the user's account. Each RACFid must be registered to one (and only one) account. A RACF Group may have multiple RACFids registered to it.
USER-DEFINED GROUP	also called @group - a collection of RACFids that can be treated as a single entity for the purpose of data set protection. Each user-defined group has three components: a two-to-eight character name (of the form @name), an owner, and member RACFids. RACF groups offer a convenient way to control access to one or more data sets. When you protect a data set, you specify an access list of users who will be able to read or update the data set. If the access list includes RACF groups, you can maintain a single RACF group containing the RACFids of persons who are able to access your data sets.

OWNER

the RACFid with the authority to perform RACF functions that no other RACFid can perform. There is an owner for each RACFid, RACF group, user-defined group, and RACF data set profile.

- The owner of a user-defined group is established when the group is established. The owner is the group member RACFid with authority to add and remove members and delete the group.
- The owner of a data set is established through the RACF Profiles area of Web RACF and is the RACFid of a user who can authorize other users (both individuals and user-defined groups) to access the data set.

The owner is the only person allowed to change ownership. The owner of a data set can be changed in the RACF Profiles area (Change owner of RACF profile) of Web RACF. The owner of a user-defined group can be changed in the RACF Groups area (Change owner of a group) of Web RACF.

UNIVERSAL
ACCESS (UACC)

established in the RACF Profiles area of the Web RACF facility. It is used to establish initial protection for the data set. The Universal Access specifies the default access to the data set for users who have not been specifically authorized to access the data set.

The choices are:

None	allow no access
Read	allow only read access
Update	allow read and write access
Alter	allow read, write, scratch, and rename access

To change the UACC, select the Change Universal Access function in Web RACF.

ACCESS LIST the list of RACFids and user-defined groups that have been authorized to access the data set, and the level of access (NONE, READ, UPDATE, or ALTER) for each. The access list is saved in a system database and is not part of the actual data set. The access list is created and changed through the RACF Profiles area of Web RACF. To display the access list, use the RACF Profiles (Display (RACF profile for a data set)) area of Web RACF. In addition to the authorities listed in the access list, any batch job or interactive session with a RACFid that is the same as the userid in the high level prefix of a data set will have ALTER access to the data set.

GENERIC PROFILE a profile that uses special characters (% , * , **) to create a “mask” that is compared against the actual name of a given data set and, if matched, defines the protection for that data set. The use of generic profiles is highly recommended. See Section 4.6.3.

DISCRETE PROFILE RACF protection for only one data set. The name of the discrete profile matches the name of the data set protected. See Section 4.6.3.

SPECIAL CHARACTERS the set of characters (% , * , **) that are used in the profile name to create a “mask.” If no special characters are used, the generic profile (Only one ** special character is allowed per profile).

% special character matches one character. There may be one or more in a profile. For example, \$III.DATA%%%.TEST would protect the data set \$III.DATAMIN.TEST.

* special character matches zero or more characters until the end of the qualifier. It only applies to one qualifier, that is, the generic profile \$III.AB.CD* would protect data sets \$III.AB.CD or \$III.AB.CDEF, but would not protect data set \$III.AB.CD.EF.

used as a qualifier at the end of a profile to match one qualifier until the end of the data set name. For example, the generic profile \$III.AB.CD.* would protect data set \$III.AB.CD.EFG, but would not protect data set \$III.AB.CD.EF.GH.

** special character matches zero or more qualifiers. For example, \$III.AB.CD.** would protect \$III.AB.CD or \$III.AB.CD.EFG, but would not protect the data set \$III.ABC.DEF. Note that the ** must appear immediately after a period (.), for example, \$III.ABC.DE** would be an invalid profile.

4.6.3 Protecting Data Sets

All disk and tape data on Titan must have a RACF profile. To establish the level of protection needed, use the RACF Profiles area (Protect a data set) in Web RACF. When a new userid is created, the account sponsor specifies a default level of access (UACC) for all data sets created with that userid as the high level qualifier.

There are two methods for protecting data sets with RACF—generic profiles and discrete profiles.

Generic Profiles

Generic profiles allow users to create a single profile that protects multiple data sets, and to create a profile for a data set that remains in effect even when the data set is scratched and reallocated. Using Web RACF, go to the RACF Profiles area (Protect a data set) to create a generic profile.

By using the special characters %, *, ** in the profile name, you can create a data set “mask” that is compared against the actual name of the data set. If the data set name matches the mask, it receives the protection defined by the RACF profile. If none of the special characters are used in the generic profile, only the data set whose name exactly matches the profile is protected. These characters may be used alone or in combination to produce highly flexible generic profile names.

For example, the generic profile

```
AAAAIII.**
```

protects all data sets stored under userid AAAAIII.

The profile

```
$III.QRST*.**
```

protects all data sets stored under userid \$III whose names begin QRST.

RACF provides the following benefits for data set protection:

- With RACF generic definitions you can be very selective as to which data sets are protected based on their names, and you can have different generic definitions for different sets of names.
- Your associates will be given access transparently (if they are authorized to it).

Discrete Profiles

A discrete profile can only protect a single data set. If you are currently using discrete RACF profiles, you will probably find it more convenient to use generic profiles for the following reasons:

- If a data set with a discrete profile is scratched or deleted, the RACF protection also disappears.
- If the data set is later recreated, the discrete profile will not be automatically recreated. Instead, the data set will be protected by an existing generic profile.
- Web RACF does not permit users to set up discrete profiles. To set up a discrete profile, you must use TSO commands.

Converting to generic profiles is simplified by the fact that if both generic and discrete profiles protect a data set, the discrete profile takes precedence. Therefore, you can create the necessary generic profiles and then DELETE the discrete profiles afterwards. As the discrete profiles are removed, the generic profiles will provide the protection.

The following tables were extracted from an IBM RACF manual and provide a summary of generic profile naming conventions.

Figure 4-1. Generic Data Set Profile Names Created with Enhanced Generic Naming Active—Asterisk and Double Asterisk at the End

Profile Name	AB.CD*	AB.CD.*	AB.CD.**
Resources protected by the profile	AB.CD AB.CDEF	AB.CD.EF AB.CD.XY	AB.CD AB.CD.EF AB.CD.EF.GH AB.CD.XY
Resources not protected by the profile	AB.CD.EF AB.CD.EF.GH AB.CD.XY ABC.DEF	AB.CD AB.CDEF AB.CD.EF.GH ABC.DEF	AB.CDEF AB.CDE.FG ABC.DEF
Profile Name	AB.CD*.**	AB.CD.*.**	
Resources protected by the profile	AB.CD AB.CD.EF AB.CDEF AB.CDEF.GH AB.CD.EF.GH AB.CD.XY	AB.CD.EF AB.CD.EF.GH AB.CD.XY	
Resources not protected by the profile	ABC.DEF	ABC.DEF AB.CDEF AB.CDEF.GH AB.CD ABC.XY.XY.EF	

Source: *z/OS V1R4.0 Security Server RACF Command Language Reference*, (SA22-7687-03)

Note: Although multiple generic profiles might match a data set name, only the most specific actually protects the data set. For example, AB.CD*, AB.CD.**, and AB.*.*. CD all match the data set AB.CD, but AB.CD** protects the data set.

Figure 4-2. Generic Data Set Profile Names Created with Enhanced Generic Naming Active—Asterisk, Double Asterisk, or Percent Sign in the Middle

Profile Name	ABC.%EF	AB.*.CD	AB.**.CD
Resources protected by the profile	ABC.DEF ABC.XEF	AB.CD.CD	AB.CD AB.X.CD AB.X.Y.CD
Resources not protected by the profile	ABC.DEFGHI ABC.DEF.GHI ABC.DDEF	AB.CD AB.CD.EF AB.CDEF ABC.DEF ABC.XY.CD ABC.XY.XY.CD	AB.CD.EF AB.CDEF ABC.X.CD.EF ABC.DEF ABX.YCD

Source: *z/OS VIR4.0 Security Server RACF Command Language Reference*, (SA22-7687-03)

4.6.4 Web RACF

Registered users of Titan can access the RACF facility from the web and issue RACF commands from any browser. To access Web RACF, go to:

<https://titan.nih.gov/racf>

Titan users can submit information through the web, and Web RACF formats all RACF commands. The commands go to the mainframe system for processing and the user receives a response indicating successful completion or an appropriate RACF message.

Users must have a valid Titan userid and password in order to submit any RACF request. The userid entered must be authorized to perform any RACF function requested. Generally, this means that only the owner (creator) of a data set profile can change RACF access to that data set.

Among its functions, Web RACF allows users to:

- change the user's RACF password
- permit individual, universal, and group access to mainframe data sets
- set up generic profiles for data set protection
- change the Universal Access (UACC) for a profile
- change the owner of the profile
- view the RACF profile of a mainframe data set
- create or delete RACF groups

- add or remove users from a RACF group
- change the owner of a RACF group
- display attributes of a RACF group
- control which users can submit, read (fetch)/purge batch jobs

Web RACF allows security coordinators to:

- perform RACF functions for users of an account
 - set a user's password
 - revoke and resume a user's RACF access

Typical Tasks

The following table describes how to perform some typical tasks using Web RACF.

4-3. RACF Typical Tasks

Task	Web RACF Area
Change the password.	Change RACF Password
Establish protection for a data set. (Note: protecting a data set establishes a UACC and gives the user whose RACFid is in the high level prefix of the data set ALTER authority.)	RACF Profiles – Actions (Protect a data set)*
Give other users specific access to a protected data set.	RACF Profiles – Actions (Add user to access list to data set)*
Change the access of a specific user.	RACF Profiles – Actions (Add user to access list to data set)*
Remove the access given to a user.	RACF Profiles – Actions (Remove user from access list)*
Change the UACC of a protected data set.	RACF Profiles – Actions (Change UACC)*
Create a user-defined RACF group.	RACF Groups – Actions (Create a RACF group)
Add users to a user-defined RACF group.	RACF Groups – Actions (Add users to a group)

Task	Web RACF Area
Remove users from a user-defined RACF group.	RACF Groups – Actions (Remove users from a group)
Delete a user-defined RACF group.	RACF Groups – Actions (Delete a RACF group)
See the group names in which a RACFid is a member.	RACF Groups – Display (Groups containing user)
See which RACFids have been given specific access to a protected data set. (Note: The output from this function will also show the UACC of the data set.)	RACF Profiles – Display (RACF profile for a data set)

* GENERIC option recommended

4.6.5 TSO RACF

As an alternative to using Web RACF, you can execute RACF commands directly through TSO or in a batch job. If you need assistance with issuing RACF commands under TSO, contact the NIH Help Desk or refer to the RACF documentation available from the CIT publication service. See Section 5.4.

Entering RACF Commands

A cataloged procedure, BATCHTSO, is available for entering RACF commands in a batch job. The formats for the RACF commands are the same in TSO and batch. The TSO convention governing the use of single quotes around data set names applies (i.e., a data set name enclosed in single quotes will be processed as entered, but a data set name not enclosed in single quotes will have the TSO userid added as a prefix automatically before processing). If the latter method is used, a PROFILE statement must precede the RACF command.

The following example illustrates the use of BATCHTSO:

```
//STEPNAME EXEC BATCHTSO
//SYSIN      DD *
PROFILE      PREFIX(userid)
              (RACF commands)
              ``
/*
```

Any number of RACF commands may follow the SYSIN DD statement. For further information, refer to the *Titan Batch Processing* manual.

Changing a Password

To change your password:

- At the TSO logon panel, enter a new password in the New Password field.

```
New Password ==> newpass
```

For details about the TSO logon panel method, see Section 7.2.

- Use the RACF “PASSWORD” command during a TSO session.

```
PASSWORD PASSWORD (ENTER)
```

The system then prompts you to enter your old and new passwords.

- Submit the RACF “PASSWORD” command in BATCHTSO.

```
//STEPNAME EXEC BATCHTSO
//SYSIN      DD *
PASSWORD PASSWORD(oldpass newpass)
```

Web-Based Alternatives for Changing Passwords

- Use Web RACF (see Section 4.6.4). This is the preferred method.
- Use the web-based Password Reset facility to change your RACF password if you are associated with NIH and have an NIH Login user name and password. Go to:

<http://silk.nih.gov/passwordset>

Allowing Individuals or Groups to Use a Protected Data set

The PERMIT command grants a specific level of access to other users of a data set. For example:

```
PERMIT dsname ID(xxx) ACCESS(level of access)
```

Where: “xxx” may be the userid or RACF group. Multiple userids or RACF groups may be specified in the ID field with separating blanks or commas. Level of access entries and meanings are described under “Level of Access,” earlier in this section.

Allowing Universal Access to a Protected Data set

The ALTDSD command with the UACC operand grants all users a specific level of access for a data set. The format is:

```
ALTDSD datasetname UACC(access-authority)
```

4.6.6 Tape Data Security

Tape data set security on Titan is handled by RACF permissions on a data set rather than volume basis. Data set protection depends on the RACF profiles in place and applies to any data set, regardless of whether it is on tape or disk.

Note: If you wish to use the naming convention of aaa.iii.dataname, the security coordinator must create RACF profiles of the form AAA.III.** and must permit the \$III userid ALTER access to that profile. Optionally, the security coordinator can set the owner for the AAA.III.** RACF profile as \$III. This allows the \$III user to use RACF commands to permit other users access to data sets on tape. Unless these RACF permissions are given, the generic profiles currently in use for disk data sets will be used and some tape jobs may fail.

4.7 PROTECTION FOR SCRATCHED DATA SETS

When a data set is scratched, the data set's entry is removed from the Volume Table of Contents (VTOC). The disk space occupied by the data set is released for reuse, but the data itself remains on the disk. The operating system does not automatically erase or "over-write" scratched data sets. The data is possibly vulnerable to disclosure to unauthorized individuals.

Users who must ensure that sensitive data cannot possibly be recovered from scratched data sets should take the additional step of erasing the data (prior to scratch) using the ADSERASE procedure, described in the *Titan Batch Processing* manual. ADSERASE can also be used to erase data from tapes.

The RACF ERASE capability (for RACF protected data sets) and the ERASE option for any AMS command (for VSAM data sets) cannot be used at the NIH Data Center because they cause severe performance problems.

5 USER SUPPORT

Many types of assistance are available to users to help them make efficient and effective use of the Titan system. The NIH IT Help Desk- provides a single point of contact for phone calls and web-based requests for technical assistance. The NIH Help Desk supplies assistance to users with support from the staff of the NIH Data Center and other parts of CIT. See Section 1.3.1 for useful phone numbers. See Section 1.1 to learn about other CIT services provided by the individual organizational components of CIT.

The comprehensive consulting services offered to customers by CIT include problem resolution and assistance with Titan services described in this manual. CIT can assist users on connectivity strategies and services, including interactive login and file transfer services that are part of NIHnet, and remote access technologies. Consultants are also available when a system problem occurs that prevents a user's work from continuing—a situation which requires a quick response for a solution/circumvention.

Major Sources of Help

- Submit an IT Service Request to report problems, make suggestions, apply for refunds, and request consulting assistance. Enter your request via the web at:

<http://ithelpdesk.nih.gov/support>

See Section 5.2.1 for further information.

- Call the NIH Help Desk. See Section 5.2.1.
- Take a class from the CIT Computer Training Program. See Section 5.3.
- Refer to documentation describing the services provided by the NIH Data Center. See Section 5.4.
- Consult the CIT web pages for additional information on specific services. Go to:

<http://cit.nih.gov>

5.1.1 SOFTWARE SUPPORT

The NIH Help Desk offers consulting and assistance on a variety of software and services. The NIH Help Desk will try to answer questions on any product used by CIT customers. Titan software and services, specifically documented in this guide, receive a high level of consulting. Support comes in the form of responses to IT Service Requests, technical documentation, maintenance, advance announcement of all changes, and full conversion support (if the product is upgraded or discontinued).

Figure 5-1 lists software facilities available to Titan customers for application development.

Figure 5-1. Supported Software

Category	Software Facilities	Section
Operating System	z/OS Operating System and Job Control Language	7.1.1
SILK Web Facilities	Customer Locator	7.6.1
	Customized Servers	
	Disk Space Allocation/Cost Procedure	
	Display or Purge Jobs	
	Easymail	
	Formsmail	
	Human Resources Information and Benefit System (HRIBS)	
	Job Scheduler	
	Manage Migrated Data Sets	
	Model 204	
	Password Reset	
	Public Server	
	Purchase Tape	
	RACF	
	Secure File Transfer	
	Secure Server	
	TSO Commands	
	View/Download Private Data Sets	
	View/Download Public Data Sets	
	Web Listoff	
Web Sponsor		
Web Sponsor via NIH Login		
Web Submit		
Database Services	DB2	7.4.3.1
	IMS	7.4.2
	Model 204 (Fast Unload, Fast Reorg)	7.4.1
	Oracle client services	7.4.3.2
Interactive Systems	CICS	7.3
	ISPF	7.2.1
	MAX	7.2.2
	MVS/QuickRef	7.2.3
	NIH WYLBUR	7.2.5
	TSO	7.2

Category	Software Facilities	Section
Programming Languages	C/C++	7.5.6
	COBOL	7.5.1
	High Level Assembler	7.5.4
	PL/I for OS and VM	7.5.3
	REXX	7.5.5
	VS FORTRAN	7.5.2
Scientific Statistical Systems	BMDP	7.7.2
	SAS	7.7.1
	SPSS	7.7.3
Connectivity/Network	Connect:Direct	6.4.3
	FTP for the Macintosh	6.4.1.2
	IND\$FILE	6.4.4
	QWS3270 Secure	6.3.1
	SSH (secure shell)	6.4.3
	TN3270 for the Macintosh	6.3.2
	TN3270X for the Macintosh	6.3.2
	WS_FTP Pro	6.4.1.1
Other	BookManager	7.11
	IOF	7.8
	IRS ²	7.10.2
	VISION:Builder ³	7.10.1
	VPS printing service	6.5

² Limited support from CIT

³ Limited support from CIT

5.2 CONSULTING SERVICES

Consulting services are offered to all registered users, without charge, through the NIH Help Desk.

5.2.1 General Help Desk Assistance

The NIH Help Desk provides customer support for the services and facilities supported for the enterprise systems.

Web: <http://ithelpdesk.nih.gov/support>

Call: 301-496-4357 (301-496-HELP)
866-319-4357 (toll free)
301-496-8294 (TTY)

Consulting assistance is available on all software supported by the NIH Data Center, as well as questions concerning LANs, networking, and NIHnet (e.g., e-mail, connectivity with the enterprise systems, and network connectivity strategies). Refer to Section 1.4 for the hours of operation.

The NIH Help Desk consultants can answer most questions, but will refer more complex problems to subject matter specialists. The expertise and experience of the senior staff members are available to any registered user who calls the NIH Help Desk.

Regardless of the software you are using, if you think that an action you are taking during an interactive session or while running a batch job is causing the system to crash, you must contact the NIH Help Desk immediately. If you cannot reach the NIH Help Desk by phone, submit an IT Service Request online and suspend all action until you are notified. Do not try to modify the command or job and resubmit it. (See Section 5.2.2 for information on submitting IT Service Requests.)

Users who plan to acquire or develop large systems at the NIH Data Center should contact CIT to set up a meeting to discuss the proposed software in detail. This will help ensure that the new system will adhere to the job standards and will not conflict with published restrictions.

5.2.2 IT Service Request

Users report problems, request refunds, and communicate suggestions, comments, and needs to CIT through a web-based IT Service Request. The information from these reports helps the staff formulate future policies, plan systems changes, and informs users of common trouble areas. IT Service Requests can deal with supported software, hardware, network connections, or service for hosting systems (including Titan). The staff will not be able to respond to problems with software or hardware (e.g., workstations) not supported directly by CIT.

Submitting an IT Service Request

To submit an IT Service Request, go to the NIH Help Desk web site at:

<http://ithelpdesk.nih.gov/support>

and follow the online instructions. The steps are as follows:

- Identify yourself.
 - If you have an NIH Login account, select the first option on the “Identify yourself” screen.
 - If you do not have an NIH Login account, be sure to indicate that on the “Identify yourself” screen.
- Verify customer and contact information (submission on behalf of someone else, if desired, can be done at this step).
- Classify your request.
- Describe your request (with the ability to specify the type of computer, enter a description, provide special routing instructions, and add attachments).
- Review and submit your request.
- If you need assistance with the online form, click on Help in the upper right-hand corner of the IT Service Request screen.

If you have an IT emergency, it is best to contact the Help Desk by phone. See Section 5.2.1 for the phone numbers. Examples of IT emergencies include:

- a system-wide outage
- a security event
- stolen equipment with sensitive data
- time sensitive equipment request
- critical data loss or recovery
- a problem that severely impacts production (not test or development) work and cannot wait

Whenever possible, CIT staff will try to provide a temporary solution or bypass for the problem. Permanent fixes typically take longer since they may require coordination with the software developer or vendor.

Providing a Description for an IT Service Request

For any IT Service Request, whether submitted via the web or by telephone, include a description of the suggestion, problem, or complaint that clearly, but briefly, explains the area of concern. The problem description should include all information (for example, data set names, job numbers, etc.) needed to resolve the problem.

The amount of documentation needed depends on the severity, complexity, and nature of the problem. Sometimes it helps to attach a form or a screenshot to show the Help Desk the contents of an error message. For printing problems, extensive listings may not be required. However, you may wish to retain the output header and trailer sheets and a few pages showing the problem in case they must be examined.

Tracking and Updating a Service Request

CIT uses Remedy's Action Request System (AR) to track Service Requests internally. This system automatically creates a “ticket” that is associated with a user's problem. When you submit an IT Service Request, the system will notify you of the Remedy “ticket” number for future reference.

You can search for a particular ticket by selecting Ticket Search from the menu bar of the NIH IT Help Desk web page:

<http://ithelpdesk.nih.gov>

To view your ticket history or send an update to your ticket, select Find Service Request from the menu bar.

Canceling an IT Service Request

To cancel an IT Service Request (e.g., the problem has been solved or no longer requires an answer), do one of the following:

- Submit another IT Service Request to cancel the previous one.
- Telephone the NIH Help Desk immediately (see Section 5.2.1).

Requesting a Refund

To obtain a refund, a user must submit an IT Service Request through the web. See Section 3.2.2 for more information about refunds.

5.2.3 Networking and Telecommunications Assistance

The NIH Help Desk provides advice and assistance to users with a wide variety of telecommunications, networking, and connectivity problems. Users who suspect that communications hardware or software maintained by CIT may be causing their problems should contact the NIH Help Desk. CIT provides help with:

- mainframe connections via TN3270, FTP, and SSH

-
- remote access services (including Parachute, VPN)
 - remote printing via TCP/IP
 - NIHnet connectivity services on a LAN (communications problems)
 - JES2/NJE node connections
 - NIH telecommunications services (including NIH telephone systems and services)

5.2.4 Relational Database Assistance

There are additional forms of assistance available for relational database technologies (DB2, Oracle, and SQL Server). Refer to the Computer Services telephone directory in Section 1.3.1.

For more information on relational database systems supported on Titan, go to:

<http://titan.nih.gov>

and select Database Services.

5.2.5 Assistance for Implementing Non-NIH Software

Users who are considering, or are in the process of acquiring or developing, a software package should contact CIT to arrange a meeting to discuss implementation. The purpose of this meeting is twofold:

- To ensure that the proposed software will comply with the NIH Data Center standards and will not have a detrimental effect on other users. This compliance is mandatory in the open-shop environment at NIH.
- To help the NIH Data Center staff project the resource requirements of the user community as a whole (e.g., additional resources such as online disks, etc.).

If a large system is designed without prior consultation with the appropriate CIT personnel, it may require extensive modification before it is implemented, or it may not be able to run at all. Avoid the necessity of “after the fact” changes—this can save substantial costs, staff-hours, etc. Prior consultation often results in a more efficient, bug-free, and more easily maintained system.

If possible, representatives of the vendor should be present together with the user, so that they can gain an insight into the NIH environment and, along with it, a more accurate estimate of the work it will take to make the system compatible with NIH's standards. The staff will help the vendor plan the changes and installation of the system. Such a meeting, held early in negotiations with the vendor, is an important step in insuring a smooth, economical, and hopefully rapid installation of the vendor's system.

Whenever possible, avoid the use of device-dependent data or programs. Software packages using these features could become unusable later if the NIH Data Center upgrades its hardware.

Some software vendors charge for the use of their software based on the number of processor complexes on which the package may run. They may require the purchaser to supply processor complex serial numbers that are then checked by the software. The NIH Data Center's configuration is relatively dynamic. Acquisition of a new processor complex, and particularly changes or additions to processor complex serial numbers cannot be announced in advance. Any contract to acquire software should include some allowance for the possibility of additional or replacement processor complexes.

Transferring disk data to the NIH Data Center from other data centers via tape should be done using individual data sets. Attempting to restore data from a backup tape will often be unsuccessful because of hardware and software incompatibilities. See Section 6.4.6 for details.

For a list of the operating system software that cannot be used at this installation, see Section 7.1.1.2.

5.2.6 Additional Web-based Customer Support

In addition to allowing users to submit online service requests, the NIH Help Desk web site offers several online services that users can access any time via:

<http://ithelpdesk.nih.gov>

These services include:

- CIT Knowledge Base (KB) - the database of technical support information and references to outside resources created, maintained, and used by NIH Help Desk consultants. It includes information on software products, instructions for changing passwords, e-mail client configuration, Listserv lists, and many other topics. You can access the KB from the NIH Help Desk web site or by going to:

<http://kb.nih.gov>

CIT can also provide NIH organizations with their own closed knowledge domain. For further information, contact the NIH Help Desk.

- Frequently Asked Questions (FAQs) – The NIH Help Desk maintains a repository of customer Frequently Asked Questions about a variety of topics, including Titan, CIT accounts, changing passwords, e-mail, and remote access, among many others.
- Hot News – Hot News items represent IT service items of impact to the NIH community. The current list of Hot News items is available on the main NIH Help Desk web site.

-
- Anti-Virus Information (including virus alerts)
 - CIT Maintenance Calendar – When maintenance on NIH’s IT infrastructure is scheduled, the dates and times of the planned outages are listed here.

5.3 TRAINING

The CIT Computer Training Program offers a variety of classroom courses to assist users in making effective use of computers at NIH. Many seminars address the uses of computers in science. A variety of self-study courses are also available. Descriptions of all classroom courses, seminars, and self-study courses provided by the CIT Computer Training Program are available through the web. Course information is kept up-to-date; when a course fills early and a new session is scheduled, it will be shown. There is no charge for courses in the CIT program.

For training information and registration go to:

<http://training.cit.nih.gov>

The CIT Computer Training Program staff can answer any questions about these courses, give assistance in selecting the best course to fill specific needs, and even take your registration information over the phone. See Section 1.3.1 for the phone number.

As a convenience to NIH personnel, the CIT Computer Training Program web site has links to other computer training programs available at NIH and through HHS.

The CIT Computer Training Program fully accommodates students with disabilities. Classes are located in wheelchair-accessible buildings. People with disabilities are welcome to attend any course or seminar offered by the CIT Computer Training Program for which they have the appropriate professional background. Prospective students should inform the training staff if special assistance would be needed. For more information, see Section 1.7.

5.3.1 Classroom Training

There are three terms each year: fall, spring, and summer. Subjects include: personal computers, networks, Internet resources including web facilities, disaster recovery, the Titan mainframe system, computer security, database topics, Unix, grants, statistical packages, nVision information, and scientific seminars.

Whenever possible, special seminars will be scheduled to meet the needs of organizational groups. For information on scheduling a special seminar for your group, contact the staff of the CIT Computer Training Program through the NIH Help Desk. See Section 5.2.1.

Location

CIT classes generally meet in the on-campus classrooms, located in building 12A, or at the Fernwood Road location. Be sure to check the schedule for the training location.

5.3.2 Independent Training

A variety of online training courses are offered for students who want to study independently. Details can be found at the CIT Computer Training Program web site.

5.4 DOCUMENTATION

CIT offers a wide variety of online and hardcopy documentation to its users through the web and through ISPF.

5.4.1 CIT Publication Service

CIT provides manuals for CIT supported systems and software through the web. Anyone making active use of the NIH Data Center is responsible for obtaining and consulting the publications related to the services they use.

To order hard copy publications, view publications online, print manuals on the high-speed central printers, or print at your desktop printer, visit:

<http://publications.cit.nih.gov>

Getting Started

Each CIT or vendor document on the CIT publication pages is available through one or more of options. To get started, select a category from the list on the left side of the CIT Publications page. If you're not sure of the category for a publication, use the Keyword Search feature on the right side of the web page. For example, to find an ISPF publication, type ISPF in the search window, and a list of all ISPF manuals will be displayed. After the title appears, select from one of the available formats.

- online viewing via the View/Print On Demand Service via the web in PDF format via Acrobat reader (with the option of printing at your local desktop printer). This is a free service, available to all users.
- central printing via the View/Print On Demand Service. Many vendor manuals and CIT-written manuals can be printed in-house—double-sided, three-hole punched, on high-speed laser printers. To order copies of printed documentation, provide your Titan userid. Users must verify (and correct, if necessary) their customer information before placing an order online for a printed copy of documentation.

If you click the question mark next to the name of the manual, you will see the date, number of pages, and estimated printing charge. The charge is waived for the first printing of a new version of a manual. Users will incur charges when they request the printing of more than one copy of a manual at the central printers. There is a choice of delivery options:

- to your output box
- by mail

-
- online viewing via a web browser for documents in html format. This is a free service, available to all users.
 - hardcopy (traditional method). Some manuals (specific vendor manuals and older CIT manuals) are only available through the traditional ordering system. You must supply a logon ID (e.g., the 10-digit badge number of your NIH ID, your Titan userid, or your Helix ID). If you order documentation by this method, CIT will mail you the manual.

There may be a charge for ordering statistical software.

Contact the NIH Help Desk for assistance with ordering or printing documentation. See Section 5.2.1.

Ordering Limits

Almost all publications are given to users without charge. The NIH Data Center absorbs the cost in its overhead (which is in turn paid for from computer charges). To be cost effective, some limits must be put on the documentation service. Each user should order only the publications currently needed; if others are needed later, they can be ordered at any time. An order for an unreasonable number of publications (e.g., one of every publication stocked) cannot be filled and will be delayed until the user can be contacted to determine which publications are really necessary. Each request for a special order of documentation is reviewed as it is received. Publications not listed in the online publications system will be given to a user only if the document describes facilities offered at the NIH Data Center to its user community.

User groups with many individuals at a single location should consider establishing a library of publications to be shared by the group. Each user may still obtain a personal copy of the publications used most frequently.

People who are not registered users may receive introductory publications. Requests from non-users for any other CIT publications should be directed in writing to the Director, Division of Computer System Services.

Stay Up-to-Date

You may subscribe to a publications interest list and receive e-mail notification whenever a new manual is available. Go to the NIH Listserv page at:

<http://list.nih.gov>

Browse the list of Listserv lists and select the CIT-DOC-RENEW list. **Note:** updates for CIT publications are distributed only upon request.

When a major publication is introduced or updated, an article often appears in *Titan News*, the online mail facility described in Section 1. You can also check the Publications page that appears towards the back of *Interface* for a list of new and updated CIT publications.

5.4.2 Online Documentation via BookManager

IBM BookManager, an interactive facility on Titan, allows users to view IBM technical documentation online.

Access

To use BookManager, access the Titan system and connect to NIHTSO. Log on with your userid and password. After the informational messages appear, hit Return. From the CIT/Titan Primary Option Menu, select C for Additional Products, and then select B for Books (BookManager).

For more information on BookManager, see Section 7.11.

5.5 CONTACT BETWEEN USERS AND CIT

Two-way communication between users and the NIH Data Center staff is valuable. Input from users is a critical element in determining data center goals, policy, and allocation of staff time. It greatly affects the quality and timeliness of the end products provided to the user community. The NIH Help Desk provides information on setting up accounts, training, software, e-mail and a full range of technical issues. Suggestions on how to improve our service are always welcome. The IT Service Request, described in Section 5.2.2, is an important communication tool for users who need help. Publications, such as *Interface*, are effective vehicles for CIT-user communication. The communication tools described in this section complement the general links described above.

5.5.1 Titan News

An important means of communicating timely information with mainframe users is *Titan News*. It is distributed through an e-mail list, CIT-TITAN-NEWS@LIST.NIH.GOV. This service allows CIT to send out important information, such as updates on outages, special events, equipment and software upgrades, technical information and other issues, at short notice.

For information about Listserv, or to join or leave a list, go to:

<http://list.nih.gov>

5.5.2 Electronic Mail

Electronic mail is a standard means of communication between users and CIT. For information on the Central Email Service at NIH, go to:

<http://www.mail.nih.gov>

Listserv lists offer users a way of subscribing to information relating to a particular topic. Find out more about the NIH Listserv service at:

<http://list.nih.gov>

If you need assistance, call the NIH Help Desk. See Section 5.2.1.

5.5.3 Message Facilities

Occasionally, in a data center environment, changes to a published procedure must be quickly implemented. Titan has several methods for timely communications with its users:

CIT Hot News

CIT announces important messages concerning the status of its systems through the Hot News feature of the NIH Help Desk web page at:

<http://ithelpdesk.nih.gov>

System Broadcast Messages

A specific system, such as TSO, may send messages to all users of that system. Since this message facility is a feature of the individual system, only information of interest to the users of a particular system is broadcast in this manner.

Batch Listing Messages

Titan messages are displayed on Titan batch listings.

5.5.4 CIT-Sponsored Users Groups

There are several CIT-sponsored groups to help users exchange information in specific areas of interest. Contact the NIH Help Desk for further information. These groups include the following:

- Biomedical Research Mac Users Group (BRMUG) - Macintosh user support
- Molecular Modeling Interest Group (MMIG) - seminars on various molecular modeling topics to foster communication between NIH scientists concerning the methods and applications of molecular modeling
- Knowledge Management Interest Group (KMIG)
- The Account Sponsor Interest Group (ASIG) – a Listserv forum for discussion of issues important to sponsors, deregistration officials, and Titan account officials (e.g., billing coordinators, security coordinators). For more information, see Section 2.1.

5.6 INPUT/OUTPUT DISTRIBUTION SERVICES

Printed output is handled as follows:

- Jobs submitted locally or interactively without a “ROUTE” or “DEST” statement are printed at the Bethesda campus of the NIH Data Center.
- Computer output is either placed in assigned combination lock boxes or in “special handling” areas. Only users who have been given the combination by their respective account sponsors have access to the lock boxes.
- For output designated for Parklawn delivery points (“P” preceding the box number), users must make their own delivery arrangements. See Section 5.6.1 for information on output boxes.

5.6.1 Output Boxes

CIT provides locked output boxes at the Bethesda NIH campus—located next to the Output Distribution Services counter in building 12A. To access an output box you must enter the BAC (box access code) at a keypad located by the bank of output boxes.

All Titan users have a default box number value assigned; however they can set or change their output box numbers.

Box Numbers

To see your output box number, go to Customer Locator at:

<http://silk.nih.gov/locator> (requires your NIH Login)

or

<http://silk.nih.gov/locatorn> (requires your Titan login)

Enter your name or userid, and select Display.

At the display of your assigned box number, you may see one of the following values:

nnnn	This is the desired box number at the NIH main campus.
Pnnn	This is the desired Parklawn box number.
NONE	An output box is not needed. This option is designed for users who do not use the central printers on Titan, such as people who only use VPS or Helix. Any output that is printed at the central printers is thrown away, but incurs a printing charge.

NOBX

No box number has been set. If the account sponsor does not specify an output box number or NONE for a user at registration, this is the default. If you try to run a job on Titan with a box number of NOBX, the job will fail with a JCL error.

For Jobs Run at a Remote Site

You can run a job at a remote site with a box number of NOBX and print the output at a VPS printer. If you send the output to a central printer on Titan, the output will print and be thrown away. You will be charged for printing.

If you do not specify a box number in your JCL, your assigned box number is used. If, however, you specify a box number in your JCL (by using a former South System-style job card, a /*BOX statement, or a /*JOBPARM ROOM=bbbb statement), it overrides the assigned box number.

If a box number is not provided in the JCL and the default output box setting is NOBX, the job will be rejected. Any output that prints on a central printer without a valid box number will be disposed of, and the user will be charged for printing.

How to Change Your Box Number

To change your output box number, select Set Box Number on the appropriate Customer Locator page. (See Section 1.3.2.2) Your account sponsor can tell you the box numbers that are valid for your account and the entry code for the box you select. If you set a new box number, be sure to click the SET button on the Box Number Update page after you enter the new value.

If you have any questions on displaying or setting your assigned box number, contact the NIH Help Desk. See Section 5.2.1.

Special Handling

If output is too large to fit in a user's locked output box, the box will contain a special key with an attached box number for a nearby oversized locked box. The output can then be picked up at the oversized locked box. All large-volume output, including output marked "Private," will therefore be secured.

Boxes for Mailed Output

Users at a remote location should obtain a mailing box number (with an "M" prefix) so that output produced at the central facility can be mailed to them. Users who choose this service must accept full responsibility for delays, damage, or loss incurred in the mails and must limit the volume of output to be mailed to that which will fit in one 12 by 16 inch U.S. mail envelope (NIH Supply Number 7-7106). Box numbers are limited to 4 characters, including the M prefix.

5.6.2 Misdirected Output

Occasionally output is misdirected because of a user error or mishandling by the NIH Data Center. This can cause great frustration for the user who should have received it. If you locate misdirected output, please inform Output Distribution Services, located in building 12A of the NIH Bethesda campus, as soon as possible. See Section 1.3.1 for the telephone number.

6 NIH CONNECTIVITY AND NETWORK SERVICES

This section provides an overview of CIT's network connectivity services and the software products supported by CIT to access Titan's facilities.

The Center for Information Technology provides network connectivity to Titan services. Network connections and reliability are monitored 24 x 7. Contact the NIH Help Desk for all connectivity assistance, including software recommendations.

Users can access Titan through TCP/IP (Transmission Control Protocol/Internet Protocol) connections from their desktop computers. TCP/IP supports high-speed file transfer, remote job submission, and TN3270 connections. For additional information, refer to the manual *Network Access to Titan*, available from the CIT publication service (see Section 5.4).

6.1 ROLE OF NIHNET

Network connectivity is an essential tool for the biomedical, clinical, and administrative communities at NIH, other government agencies, and organizations worldwide. NIHnet is the NIH backbone network that interconnects the Institutes and Centers (ICs), local area networks (LANs), and the NIH Data Center with the Internet, Internet2, HHS operating divisions (via HHSnet), and other government agencies. It controls access between the ICs and between NIH and the outside world. Information carried by NIHnet includes biomedical, clinical, and administrative data.

NIHnet is a wide area network (WAN) comprising the physical infrastructure of cable, optical fiber, routers and switches; network management control systems, servers, and workstations. This infrastructure supports the NIHnet operation; wireless access points; and security control systems, which include border firewalls, intrusion detection systems (IDS), content filtering systems, and virus detectors.

The topology of the NIHnet backbone uses redundant connections and equipment locations to provide more resilience and resistance to outage. To ensure sufficient capacity for data requirements, the NIHnet has several high-speed primary connections to the Internet. A portion of NIHnet resides in the machine room of building 12.

CIT also supports remote access technologies (e.g., dialup and VPN) for users whose workstations are not directly connected to the NIHnet. See Section 6.1.3.

6.1.1 NIHNET-Based Services

A NIHnet connection provides reliable, high-speed access to a wide variety of network services. The NIH Data Center supports network services that allow Titan users, with a NIHnet connection from their desktop computers, to:

- perform high-speed file transfers (e.g., FTP, SSH). See Section 6.4.

-
- submit batch jobs. (See the manuals *Network Access to Titan* and *Titan Batch Processing*.)
 - take advantage of client/server database management systems (see Section 7.4.3)
 - send e-mail worldwide (see Section 7.9)
 - transmit Titan output to a local network printer (see Section 6.5)
 - initiate full-screen sessions (via TN3270) to Titan (see Section 6.3)
 - access the web

For More Information

For more information on the NIHnet and specific NIHnet-supported services, contact the NIH Help Desk (see Section 5.2.1) or go to:

<http://cit.nih.gov/ProductsAndServices/Networking/>

The variety of NIHnet-based services reflects the heterogeneous nature of the NIH environment and of the Internet as well. Despite their variety, however, these network services have one thing in common: NIHnet is the conduit by which they are delivered to users at NIH.

6.1.2 Useful Web Services

Many CIT and NIH Data Center facilities are available through a web-based interface. CIT web facilities allow users to upload and download files, change passwords, read documentation (including *Interface*), order manuals, look up an e-mail address, register for a training course, submit an IT Service Request, use RACF (see Section 4.6.4), change account information (for account sponsors), and learn about-or take advantage of many other CIT services.

SILK (Secure Internet-LinKed) web technologies, supported by the NIH Data Center, allow users to access data stored on Titan and use many CIT enterprise applications. For information on SILK, see Section 7.6.1 or visit:

<http://titan.nih.gov>

For a directory of helpful web services for NIH Data Center users, go to:

<http://cit.nih.gov/ProductsAndServices/ApplicationHosting/AboutDataCenter/PopularWebSites.htm>

6.1.3 Remote access to the NIHnet

CIT supports remote access technologies to allow users to access the NIHnet from home, another office, or while traveling. Requests for remote access authorization must be made by the account sponsor through Web Sponsor. See Section 2.3 for information on Web Sponsor.

6.1.3.1 Parachute for Dialup Access

Parachute/Modem provides dial-up access to NIH and Institute computing resources while working with a home or mobile computer equipped with a modem. This method uses your current phone line though it does not allow voice calls to be made over the same line while connected to Parachute. The connection speed is 56Kbps.

To connect to Titan through Parachute access to the NIHnet, you will also need a 3270 (full-screen) terminal emulation software package, such as QWS3270 Secure installed on your workstation. For information on QWS3270 Secure, which is supported by CIT, see Section 6.3.1.

How to Apply for Parachute

To apply for Parachute service a customer must:

- have a valid Titan userid. If you do not have a Titan userid, one will be created specifically for remote access use when the account sponsor requests Parachute service through Web Sponsor.
- have a valid business reason for needing this service
- be registered in the NED (NIH Enterprise Directory). See Section 1.3.2.1 for information on the NED. Under some circumstances, CIT can register a person outside of NIH to the NED (as a guest) in order to register for a remote access account.
- obtain an Active Directory Account (NIH Login Username); the exact method varies by IC. Contact the NIH Help Desk (see Section 5.2.1) for assistance.
- take the appropriate online security-related training courses that are available at: <http://irtsectraining.nih.gov> **and** certify the NIH Remote User Access Certification Agreement, using a web-based form, available at: <http://cims.cit.nih.gov/nihforms.cfm?form=remote.access>

Since this service permits a desktop computer to effectively “be part of NIHnet,” security is a vital concern.

- ask the account sponsor within your organization to request Parachute service for you. The sponsor makes the request through Web Sponsor (see Section 2.3).

Access

See below for the Parachute access telephone numbers. Please use one of the first pair of numbers (depending on whether you are dialing locally or long distance). If that number is busy, use one of the second pair of numbers.

Figure 6-1 NIHnet Access through Parachute

Service	NIHnet Access	Assistance
NIHnet access through Parachute	301-402-6830 800-827-0124*	301-496-4357 (301-496-HELP)
	301- 951-6874 866-753-3457*	866-319-4357 (toll free)
		301-496-8294 (TTY)

All telephone numbers are accessible through FTS.

*These 800/866 numbers should be used only by persons who do not have access to FTS2001.

For More Information

For more information about Parachute and other remote access technologies, go to:

<http://remoteaccess.nih.gov>

and select Parachute/Modem.

For assistance, contact the NIH Help Desk (see Section 5.2.1).

6.1.3.2 VPN

VPN (Virtual Private Network) allows NIH employees to access the NIH network and computing resources over a third-party Internet Service Provider (ISP) such as that from Verizon DSL, AOL, or Comcast Cable. You will need to contact your third-party ISP to verify that the ISP allows VPN over their network. Connection Speed: Not applicable as this service uses your current Internet connection so it is dependent on that connection's speed.

How to Apply for VPN

To apply for VPN service a customer must:

- have a valid Titan userid. If you do not have a Titan userid, one will be created specifically for remote access use when the account sponsor requests VPN service through Web Sponsor.
- have a valid business reason for needing this service
- be registered in the NED (NIH Enterprise Directory). See Section 1.3.2.1 for information on the NED. Under some circumstances, CIT can register a person outside of NIH to the NED (as a guest) in order to register for a remote access account.
- obtain an Active Directory Account (NIH Login Username); the exact method varies by IC. Contact the NIH Help Desk (see Section 5.2.1) for assistance.

-
- take the appropriate online security-related training courses that are available at: <http://irtsectraining.nih.gov> **and** certify the NIH Remote User Access Certification Agreement, using a web-based form, available at: <http://cims.cit.nih.gov/nihforms.cfm?form=remote.access>

Since this service permits a desktop computer to effectively “be part of NIHnet,” security is a vital concern.

- ask the account sponsor within your organization to request VPN service for you. The sponsor makes the request through Web Sponsor (see Section 2.3).

For More Information

For more information on VPN, go to:

<http://remoteaccess.nih.gov>

and select VPN.

For assistance, contact the NIH Help Desk (see Section 5.2.1).

6.1.4 Domain Name Servers

In TCP/IP-based networking, the name server is the networked computer that translates Internet names, such as tn3270.titan.nih.gov, into the Internet Protocol Address (Internet number or IP number) necessary to make the connection. All connections to CIT TCP/IP-based services should be done through the Internet host names (see Section 6.2), since the numerical IP addresses are subject to change.

The domain name servers (DNS) at NIH handle the name-to-address conversion for TCP/IP connections. For example, if a user on the network wants to open a file transfer (FTP) session using FTP to Titan, the person would FTP to FTP.TITAN.NIH.GOV. The name server then translates that address into the Internet number for the actual FTP session.

NIH users can register a host name, set up an alias, perform DNS lookups, assign additional IP addresses, and perform other basic DNS changes themselves through the web. Go to:

<http://cit.nih.gov/ProductsAndServices/Networking/DomainNameServices/>

Your desktop support group will handle the network configuration for your desktop workstation. Contact the NIH Help Desk if you need assistance (see Section 5.2.1).

6.2 ACCESS INFORMATION SUMMARY

The Online Services Directory below provides the Internet host names for network connections and the telephone numbers for remote dialup access through Parachute.

Figure 6-2. Online Services Directory

Service	Internet Host Name	Dialup Access	Status
Titan			
TSO, DB2*, IMS (Full-Screen 3270)	TN3270.TITAN.NIH.GOV (For SSL 3270, specify port 2323 using your client's syntax.)	Dialup via Parachute	301-496-4357 (301-496-HELP)
FTP	FTP.TITAN.NIH.GOV		866-319-4357 (toll free)
SSH	TITAN.NIH.GOV (Specify port 9022 using your client's syntax.)		301-496-8294 (TTY)
NIHnet access through Parachute	N/A	301-402-6830 800-827-0124** 301- 951-6874 866-753-3457**	

NOTES:

You must dial the full 10 digits of these phone numbers.

N/A: Not Applicable

All telephone numbers are accessible through FTS.

* DB2 Access:

- To access the DB2 DSNP subsystem, enter “DB2” in the first field, your userid in the second field, and “DBPROD” in the third field.
- To access other DB2 subsystems, go to <http://silk.nih.gov/dbtek/db2doc> and select “3270” under “Connectivity” for details.

** These 800/866 numbers should be used only by persons who do not have access to FTS2001.

For further information on access to services running on Titan see Section 6.3.

6.3 TITAN INTERACTIVE TCP/IP SERVICES

The telnet facilities of TCP/IP allow users to access Internet-connected computer sites interactively. In order to access Titan’s interactive services (e.g., TSO and DB2) from a NIHnet-connected workstation, users must install a TN3270 full-screen communications software package on the workstation itself. All system and user-written applications that run under TSO can be reached with TN3270 access. For interactive access, connect to the Titan host name: TN3270.TITAN.NIH.GOV

Application Selection Menu

After you make the TN3270 connection to Titan, the Application Selection menu appears. Use the Application Selection menu to access Titan's interactive systems. Select NIHTSO to access most Titan services. See Section 7.2 for information about NIHTSO.

Below is a sample of the Application Selection screen.

```
EMSP03          Application Selection          Help: 17-6666 Term : TCP40617
                                                    Date: 09/10/08 Time : 12:06:07
                                                    User: TCP40617 Group :

Name-----Status
CDCNET  AVAIL
CICSProd AVAIL
CICSTST1 AVAIL
DB2     AVAIL
IMS     AVAIL
IMSTEST AVAIL
M204PROD AVAIL
M204TEST AVAIL
NIHTSO  AVAIL
TMONCICS AVAIL
TMONTCP UNAVAIL

- Enter application name or a command.

==>
PF1=Help PF2=Lang PF3=Disc PF4=Keys PF7=Backw PF8=Forw PF12=Exit
```

Users with Internet connections running the appropriate TCP/IP software on their workstations can also access other computers that are connected to the Internet (such as the NIH Helix Systems) provided, of course, that the user has the authority to use the other system.

Windows 2000 and Windows XP include TCP/IP driver software. (**Note:** This software cannot be used to access the Helix Systems.) For information on additional connectivity software for Windows, see Section 6.3.1. NIH Macintosh users should see Section 6.3.2.

6.3.1 Windows Connectivity

CIT provides software that enables Windows-based desktop computers to access the Titan system.

QWS3270 Secure for TN3270 Connections

CIT has a site license for QWS3270 Secure, a 3270 (full-screen) emulation application that allows a network-attached, desktop computer running Windows to connect to SSL/TLS-enabled IBM mainframes over a secure TCP/IP connection. This software will run on

Windows XP and is available without charge. QWS3270 Secure is fully compatible with Titan. Users can download QWS3270 Secure from the web by going to:

<http://titan.nih.gov>

and selecting NIH Connectivity Tools.

Because of the special secure port considerations, be sure to print and read the installation and configuration instructions before installation. QWS3270 Secure instructions also contain separate configuration directions for IMS/ADB users to allow them to connect directly to IMS. See Section 7.4.2 for more information.

The Federal Desktop Core Configuration (FDCC) mandate requires that persons installing this software on a NIH desktop or laptop computer have an administrative account (AA) in addition to a regular NIH login user account.

If you do not have an administrative account, please contact the NIH Help Desk to arrange for the installation of this software. See Section 5.2.1. For more information on FDCC requirements, go to:

<http://cit.nih.gov/Support/FAQ/Fdcc/>

6.3.2 Macintosh Connectivity

Customers will need a computer that is connected to the NIH Network (NIHnet) – i.e. a computer connected via an NIH office network connection, or for those using remote access, the NIH VPN or NIH Parachute services.

TN3270 or TN3270X for the Macintosh

TN3270 or TN3270X allows a Macintosh user, on a LAN connected to NIHnet, to access full-screen services, such as TSO, DB2, and ISPF. This software is available from the vendor (Brown University) at:

<http://www.brown.edu/Facilities/CIS/tn3270/>⁴

Contact the NIH Help Desk for assistance with any Macintosh connectivity issues.

6.4 TITAN FILE TRANSFER AND DATA EXCHANGE

This section describes various methods of transferring data between desktop computers and the mainframe and between NIH and other data centers:

⁴ The reference to other Internet sites is only for the convenience of web users. NIH is not responsible for the availability or content of these external sites, nor does NIH endorse, warrant or guarantee the products, services or information described or offered at these other Internet sites.

-
- FTP (see Section 6.4.1)
 - web-based secure file transfer (see Section 6.4.2)
 - SSH (see Section 6.4.3)
 - IND\$FILE for 3270 File Transfer (see Section 6.4.4)
 - Connect:Direct (see Section 6.4.5)
 - SENDFILE/RCVFILE – legacy batch programs for file exchange using NJE (see Section 6.6); should only be used for existing applications
 - exchanging tapes (see Section 6.4.6)

If a batch job is required for the data transfer (e.g., Connect:Direct and SSH), also refer to *Titan Batch Processing*. This manual is available from the CIT publication service. See Section 5.4.

6.4.1 File Transfer Using FTP

A user can transfer files between a workstation connected to the Internet, or on a NIHnet-connected LAN running TCP/IP software, and the Titan system. The FTP facilities of TCP/IP provide high-speed file transfer between a user's workstation and the other Internet site. For FTP access, connect to the host name of the FTP server on Titan:

FTP.TITAN.NIH.GOV

Refer to Figure 6-2 for information on establishing the network connection to Titan.

Users with a TCP/IP connection to the Internet can transfer files in either direction (i.e., to the mainframe, or from the mainframe to their workstations). Unix workstations can also transfer files to and from Titan using appropriate FTP software packages.

Submitting Batch Jobs Using FTP

To transmit a batch job to Titan, use the FTP command `SITE FILETYPE=JES`. For additional information, refer to the manual *Network Access to Titan*, available from the CIT publication service. See Section 5.4.

SSL/TLS FTP for Encrypted Data Transfer

SSL (Secure Sockets Layer) or its successor, TLS (Transport Layer Security), FTP ensures that all data and passwords transmitted over the network are encrypted. SSL/TLS is a protocol defining a means of encrypting data across Internet connections. SSL/TLS uses Public Key Technology to allow a client and server to agree on an encryption method and to verify the server to the client.

For Windows SSL/TLS FTP

See Section 6.4.1.1 for information on using WS_FTP Pro with SSL.

Mainframe-to-Mainframe SSL/TLS FTP

SSL/TLS FTP can be used to transfer data between Titan and another IBM mainframe system. In this case, Titan could be either the SSL/TLS FTP server or the SSL/TLS FTP client. Since the configuration and certificate process involved is fairly complex, contact the NIH Help Desk if you need to use this facility. See Section 5.2.1.

For More Information

Contact the NIH Help Desk for more information on FTP and recommendations on client products for TCP/IP-based file transfer.

6.4.1.1 WS_FTP Pro for Windows

CIT provides WS_FTP Pro, a client software package, to registered users. WS_FTP Pro is based on the file transfer protocol (FTP), provides fast transfer of files or collections of files between Internet-connected computers using Windows XP.

Secure File Transfer

You can configure WS_FTP Pro to request a Secure SSL/TLS connection to Titan, thereby providing encryption over the network. Titan users can download WS_FTP Pro software from the web. Go to:

<http://titan.nih.gov>

and select NIH Connectivity Tools. The installation and configuration instructions are included. For security reasons, we recommend that you don't allow WS_FTP Pro to encrypt and store your password in its .ini file.

The Federal Desktop Core Configuration (FDCC) mandate requires that persons installing this software on a NIH desktop or laptop computer have an administrative account (AA) in addition to a regular NIH login user account. If you do not have an administrative account, please contact the NIH Help Desk to arrange for the installation of this software. For more information on FDCC requirements, go to:

<http://cit.nih.gov/Support/FAQ/Fdcc/>

For More Information

For more information on using WS_FTP Pro for transferring files with Titan, refer to the manual *Network Access to Titan* (see Section 5.4), use the online help provided by the software, or contact the NIH Help Desk.

6.4.1.2 FTP for the Macintosh

Macintosh OS X (version 10.2 or later) can take advantage of the built-in command line Terminal application for FTP transfers to Titan. From the Macintosh Applications folder, open the Utilities folder, and then open the Terminal application.

In addition, there are many shareware FTP programs for Mac OS X that will allow you to transfer files between the Titan system and your Macintosh (e.g., Fetch). Fetch is a full-featured FTP client for the Macintosh. This software is available from the vendor (Fetch Softworks) at:

<http://www.fetchsoftworks.com>⁵

6.4.2 Web-based Secure File Transfer

Titan offers a web-based secure file transfer facility that takes advantage of SSL/TLS. The only software required on your desktop computer is a web browser. Go to:

<http://titan.nih.gov>

Click on Utilities (under Mainframe) and follow the link to Secure File Transfer. You must provide a valid Titan userid and password. You have the option to upload a file from your desktop computer to the mainframe, or download a file from Titan to your local system.

For more information about web-based secure file transfer, refer to the online help or the manual *Network Access to Titan*, available from the CIT publication service. See Section 5.4.1.

6.4.3 SSH (Secure Shell)

Titan provides the ability to directly transfer data sets and automatically translate between ASCII and EBCDIC via the SSH (secure shell) protocol. The SSH protocol is widely used on Unix systems to carry out secure (encrypted) file transfers. SSH software is also available for Windows and Macintosh machines.

SSH is available on Titan as part of Titan's UNIX System Services (USS). Refer to Section 7.1.2 for information on USS.

Because a userid must be specifically authorized to use USS, users who need this facility should contact the NIH Help Desk. A userid containing a \$ cannot be authorized to use USS.

⁵ The reference to other Internet sites is only for the convenience of web users. NIH is not responsible for the availability or content of these external sites, nor does NIH endorse, warrant or guarantee the products, services or information described or offered at these other Internet sites.

SSH Transfers Initiated on Titan

SSH transfers are carried out in batch jobs. For additional information, refer to the *Titan Batch Processing* manual (under “Transfer Utilities”). See Section 5.4 for information on CIT publications.

SSH Transfers from a Remote Host

SSH file transfers can also be initiated from a remote host by a user who does not generally access the Titan system but needs to use Titan data sets.

For more information on SSH file transfers from a remote host, contact the NIH Help Desk and ask to speak with an SSH consultant. For a technical reference for SSH transfers from a remote host, go to:

<http://datacenter.cit.nih.gov/titan-net/SSH.htm>

However, we suggest that you contact an SSH consultant before using this site.

6.4.4 IND\$FILE for 3270 File Transfer

Many PC 3270 emulation packages support file transfer between the host and the desktop computer if an IBM program named IND\$FILE is installed on the host. IND\$FILE provides the mainframe side of a file transfer capability from 3270-type terminals (or workstations emulating them). IND\$FILE has been successfully tested with such packages as QWS3270 Secure, the IBM PC 3270 Emulation Program, EXTRA by Attachmate, and IRMAremote for Hayes AutoSync by DCA. For information on QWS3270 Secure, see Section 6.3.1.

The use of IND\$FILE for 3270 file transfer requires specific software on the desktop computer. Because the use of IND\$FILE in most 3270 emulation packages is transparent to the user, it is not necessary to know how to use it, only that it is available. Perform the file transfer from the TSO ready prompt or from the command option of the CIT/Titan Primary Option Panel.

6.4.5 Connect:Direct

Connect:Direct, a product that provides host-to-host file transfer, is required by the Department of the Treasury for online financial transactions with their systems. The function it provides is similar to that of the SENDFILE and RCVFILE programs (described in the manual *Titan Batch Processing*) but it is easier to use. Connect:Direct monitors the progress of the file transfer.

Connect:Direct requires coordination with another site as well as modifications to certain Connect:Direct configuration files. Connect:Direct must be installed at the remote site as well as at NIH, and requires either a VTAM or TCP/IP connection between the two sites. Connect:Direct is controlled by a process that is similar to a JCL procedure. Once the process is written, the user needs only to supply the values for various parameters. The two parameters used most are the source data set name and the target data set name.

Registration for Connect:Direct

To register to use Connect:Direct, submit an IT Service Request that includes the following information:

- the destination of the data to be transmitted
- the nature of the data to be transmitted
- the amount and frequency of the transmitted data

Each project must have a Data Transmission Administrator (DTA) who is responsible for setting up and maintaining the jobs and Connect:Direct processes needed to transmit the data. All correspondence with CIT regarding a registered Connect:Direct project should specify the name of the DTA.

If users on other systems will be transferring files to Titan via Connect:Direct, the DTA must obtain a restrictive Titan userid for each such user. This userid will have the following special characteristics:

- Logon to NIH systems will not be permitted.
- The associated password will not expire.

Users from other systems must add the following Connect:Direct parameter to the appropriate Connect:Direct control statements:

```
SNODEID=(userid,password)
```

The DTA must arrange to have an appropriate RACF profile set up for this restricted userid by contacting the security coordinator for the account.

Connect:Direct Secure+

The Connect:Direct Secure+ option provides strong mutual authentication, data encryption, and data integrity checking for Internet transactions. It uses Secure Socket Layer (SSL)/Transport Layer Security (TLS) technology or the proprietary Station-to-Station (STS) protocol to encrypt data as it passes between Connect:Direct nodes.

For More Information

For additional information, refer to *Titan Batch Processing*.

6.4.6 Exchanging Tapes with Other Installations

Tape is the preferred medium for transporting large data files from one installation to another because RAMAC (logical 3390) disks cannot be transferred. Whether exporting or importing data, be sure that the receiving installation has the type of drive capable of processing the tape, especially cartridge tapes.

Tapes in the Virtual Storage Manager (VSM) may not be removed from the data center. See Section 10.2 and Section 10.2.5.

6.5 TITAN VPS PRINTING SERVICE

The VPS printing service supports mainframe-to-network printing from the mainframe to printers accessible via NIHnet or the Internet. Printed output from Titan can be produced on printers attached to a PC, Mac, or local area network (LAN) connected to NIHnet and running an LPD server. AppleTalk printers are supported in conjunction with the PrintShare services provided by CIT (see below).

VPS converts mainframe print output into a TCP/IP print request conforming to the Berkeley Line Print Daemon (LPR/LPD) standard. This LPR print request is then sent from Titan to the appropriate networked LPD server. Many users can share a printer, or one printer can be used exclusively by a single user.

The LPD server must be configured locally and registered with CIT prior to being used by VPS. Users are responsible for setting up the local LPD server. An IBM PC-compatible environment requires Windows 2000/XP. Almost any Unix LPD server can be used.

CIT will assist administrators in modifying configurations for VPS printing from Titan. Firewalls must be properly configured to permit VPS to deliver print requests from the Titan system to LAN printers. (They must allow traffic through from the IP address 128.231.64.34 to port 515.)

Inactive Print Queues

Local printers (print queues) that have not been used for 12 months will be flagged for removal from the table of queue names and for reissue to another user. Contact the NIH Help Desk (see Section 5.2.1), if there are any questions concerning this policy.

Additional Information

For additional information and to register your printer for VPS, go to:

<http://silk.nih.gov/silk/vps>

Macintosh Printing Using PrintShare

PrintShare, a NIHnet service developed and supported by CIT, allows networked PC, Mac, Unix, and mainframe users to print to the nearest networked AppleTalk printer. PrintShare can be used with VPS to send mainframe print jobs directly to a networked AppleTalk printer. For further information, or to register an AppleTalk printer for PrintShare, contact the NIH Help Desk. See Section 5.2.1.

6.6 NETWORK JOB ENTRY (NJE)

Network Job Entry (NJE) is a communications protocol that allows the transfer of commands, messages, programs, files, and jobs among different computing systems in a network. The NIH Data Center, in cooperation with other data processing centers, provides a capability whereby a batch job can execute at one data center and the output can be printed at another through NJE. This facility is easy to use and does not require significant JCL changes to implement. These jobs require a /*XMIT statement as part of the job control language.

Pre-registration for Printing Non-NIH NJE Jobs

Users who execute jobs outside of NIH and then transmit them to Titan for printing must pre-register with the NIH Help Desk (see Section 5.2.1). This information will allow CIT to charge the appropriate account for printing and provide contact information in case of problems.

Contact the NIH Help Desk and provide the following information:

- the originating node name (i.e., where the job will be coming from)
- the userid at the originating node
- one or more associated valid Titan userids

For example:

Information Needed	Examples
NIH Titan node name	NIHJES2
Non-NIH NJE node name	CDCJES2, HCFJES, NIHJESDR
userid registered at the non-NIH node	JOHND
associated Titan userid(s)	aaaaiii, \$iii

Additional Information

For more information on NJE, see Section 8.1.1 and refer to the manual *Titan Batch Processing*.

7 SYSTEMS AND APPLICATIONS SOFTWARE

A wide range of major systems and development facilities are available on Titan for its users. These include interactive systems, database systems, client/server products, web facilities, and programming languages. See Figure 5-1 for a list of supported software facilities.

7.1 OPERATING SYSTEMS

An operating system is a library of programs that controls resource allocation and program execution. These programs can be tailored to meet the individual requirements of a computer installation. The NIH Data Center offers application hosting services on the mainframe (Titan), hosted Unix, and Windows computing platforms.

7.1.1 Titan Operating System

The systems software serving the Titan facility is composed of the IBM z/OS operating system with job control language (JCL) and the Job Entry Subsystem Version 2 (JES2) as the user interface. For more information on job control language, refer to the *Titan Batch Processing* manual. See Section 5.4 for information on ordering documentation.

z/OS supports the latest 64-bit IBM mainframe—or zSeries—processors as well as older legacy processors. See Section 11.1 for information on the current Titan configuration.

Due to its maturity, the zSeries server can take virtualization to its logical limit, running dozens or even hundreds of server applications in a single physical machine. The zSeries server offers full virtualization at the hardware level and is optimized to have load leveling and resource sharing managed by the hypervisor, not the guest operating system or applications. The operating system vastly expands the address space that can be available to each task and uses the computer's memory more efficiently than non-virtual systems. This is possible since only the active portions of programs are kept in real memory.

JES2 acts as the batch job scheduler and controller for the operating system. z/OS allows the creation of multiple, data-only address spaces (called “data spaces”) of up to 2 billion bytes of virtual storage. z/OS substantially enhances the reliability, availability, and serviceability characteristics of the operating system.

This complex operating system presents a unified system interface to the user. Shared files and work queues make it possible to balance the workloads of the various subsystems. High availability is realized through high component reliability and design features that help provide fault avoidance and tolerance as well as permitting concurrent maintenance and repair.

The operating system is a standardized environment that offers users flexibility in the establishment and utilization of TSO sessions. Language environment (LE) is an architectural interface designed to meet IEEE's portable operating system interface (POSIX) standards. By meeting these POSIX standards for code and user interfaces, LE-conforming programs can

cross operating systems, platforms, and environments. The LE interface provides application programs with a common run-time service and run-time environment—that is, a set of resources and modules that support the execution of an application program. LE establishes a common run-time environment for all participating high-level languages (HLL).

7.1.1.1 Cross-System Enqueue

The cross-system enqueue software in use at the NIH Data Center is MIM (Multi-Image Manager) from Computer Associates. It provides automatic data set integrity protection in a multi-system environment, preventing accidental destruction of data from jobs or interactive sessions modifying any data set with the same name at the same time.

ThruPut Manager interfaces with MIM to determine which data sets are needed and the type of control (shared or exclusive) required for each data set. If a needed data set is not available, the jobs are requeued and placed in a special TM HOLD for jobs experiencing data set contention. ThruPut Manager monitors the availability of data sets on behalf of the job to determine when the job should be released from the TM HOLD queue. Once the data sets in question are available, ThruPut Manager allows the TM HOLD job to be initiated. This technique eliminates tying up system resources and degrading system throughput. In addition, jobs will no longer be canceled due to data set contention. For more information on ThruPut Manager see the *Titan Batch Processing* manual.

7.1.1.2 Software Features Not Permitted at NIH

System libraries and software modules will not be updated or changed to accommodate user software. Also, user software is not permitted to use any means (e.g., CALL, ATTACH, LINK) to invoke compilers, system modules, or the Program Management Binder unless CIT documentation specifically permits such access. These restrictions are necessary to preserve the integrity and dependability of the operating system.

The following facilities incorporated in the mainframe operating system cannot be used at the NIH Data Center because they are not supported or their use may cause performance problems:

- Checkpoint/Restart
- MVS Password Protection
- Absolute Track Allocation
- Reserve/Release Macros
- WTO/WTOR Macros
- APF Facilities⁶
- SSCT⁷
- Special SVCs
- Special SMF Exits

⁶ Contact the NIH Data Center through the NIH Help Desk concerning the use of these facilities.

⁷ Contact the NIH Data Center through the NIH Help Desk concerning the use of these facilities.

RACF ERASE option of ADDSD and ALTDSD
ERASE option of any AMS command
SUPER ZAP⁸

No list of exceptions can be complete. The *Titan Batch Processing* manual documents the software facilities to be used at the NIH Data Center. Occasionally a user will discover a non-supported feature in a supported product that works or appears to work, and will integrate it into an application. Such a user runs the risk that the non-supported feature will suddenly not work at all or worse yet, will appear to work but will actually produce erroneous results.

Before using a facility not mentioned in our documentation, submit an IT Service Request (see Section 5.2.2) to make certain it is allowed. In many cases, an alternative technique is supported.

Other Restrictions

- The creation of unmovable data sets on disk is not permitted.
- It is forbidden to have software send information about the application to the machine room operator's console.
- Under no circumstances should a user access system data sets (e.g., system libraries, disk VTOCs) with any software other than that supplied by the NIH Data Center and described in CIT documentation. Formal action will be taken against anyone who attempts to circumvent protection software and threatens the security of accounts or data.
- It is against CIT policy to permit use of the system as a recreational facility; CIT will take immediate action against anyone found using its resources to play computer games, even in learning situations. For further details on restrictions against use of computers for personal and recreational use, see Section 1.5.
- Because the printed output format of Titan utilities is subject to change without notice, software should not be designed to depend on such output. For information, refer to the manual *Titan Batch Processing*.
- Certain job control language features cannot be used at this data center. Refer to the *Titan Batch Processing* manual.

⁸ Contact the NIH Data Center through the NIH Help Desk concerning the use of these facilities.

7.1.2 Open Systems

Linux

CIT is offering a free Linux test pilot, for a limited period time, to help determine if Linux virtual servers should be offered on a production basis. The CIT Linux virtual servers are available to test open source technologies or applications. The servers, based on the z9 Business Class servers, are located in the highly secure NIH Data Center.

If Linux becomes a production service, there will be cost recovery charging, but participants in the pilot will be able to transition to the production service and avoid the initial set-up costs.

For further information, contact the NIH Help Desk (see Section 5.2.1) and ask to speak with a virtual Linux server consultant.

Unix

The UNIX System Services (USS) subsystem of Titan offers significant enhancements in the open systems arena. USS includes the POSIX programming environment. Because a userid must be specifically authorized to use USS, users who need USS should contact the NIH Help Desk (see Section 5.2.1). Keep in mind that the userid cannot contain the “\$” character.

In addition, the NIH Data Center offers an open systems environment on a separate Unix-based hosting environment (EOS). This environment hosts a variety of production and development applications. For additional information see Section 1.1.1.1.

7.2 TSO

TSO (Time Sharing Option) provides interactive access to the facilities of the computer system. Users can enter, retrieve, update, and store data; as well as create, test, and execute programs with the results available at a workstation. The following sections describe many of the subsystems and facilities that are installed to function under TSO. For additional information about TSO, refer to the TSO documentation available from CIT (see Section 5.4).

All data files to be accessed interactively must be mainframe data sets with standard data set names (See Section 10) and must be stored on disk. Tape data sets must be transferred to disk prior to processing.

Titan TSO sessions issue a warning message on the screen after every 30 CPU seconds of processing time to alert you that your TSO session may be looping. If you receive a warning:

- It will not cause your session to be automatically terminated. However, when you issue a TSO command or execute a program or CLIST, do not leave your system unattended.

- Determine if the amount of CPU time used is reasonable for the session. If the CPU time seems reasonable, ignore the message and keep an eye on the session. If the CPU time seems excessive, manually interrupt processing by pressing the key mapped to the ATTN, PA1, or PA2 key, as appropriate.

TSO/E LOGON Panel

Access the Application Selection menu (see Section 6.3) and type NIHTSO at the cursor. Tab over, enter your userid, and hit ENTER. Next, you will see the following TSO/E logon panel:

```

----- TSO/E LOGON -----

Enter LOGON parameters below:                                RACF LOGON parameters:

Userid    ===> $III (or AAAAIII)

Password  ===>                                             New Password ===>

Procedure ===> MAIN                                       Group Ident  ===>

Acct Nmbr ===> AAA (or AAAA)

Size      ===>

Perform   ===>

Command   ===>

Enter an 'S' before each option desired below:
          -Nomail          -Nonotice          -Reconnect          -OIDcard

PF1/PF13 ==> Help    PF3/PF15 ==> Logoff    PA1 ==> Attention    PA2 ==> Reshow
You may request specific help information by entering a '?' in any entry field

```

Respond by entering your password.

Tips on This Panel

- To change your password—enter a password in the NEW PASSWORD field at any time.
- To change the “Procedure” from the default—change the procedure field by typing the existing one.

CIT/Titan Primary Option Menu

Upon completion of the logon screen you are immediately placed into the message screen, which contains pertinent RACF information and any messages from the broadcast system.

Hit Enter to go to the CIT/Titan Primary Option Menu panel (ISPF Primary Option Panel), shown below. To eliminate the copyright panel in the lower left corner and see the full panel

for this screen, hit Enter. You can enter the desired option in the option field and proceed into the selected panel. **Note:** the option line is at the bottom of the panel.

```

Menu Utilities Compilers Options Status Help
-----
CIT/Titan Primary Option Menu

0 Settings Terminal and user parameters User ID . : $III
1 View Display source or listings Time. . . : 10:56
2 Edit Create or change source data Terminal. : 3278
3 Utilities Perform utility functions Screen. . : 1
4 Foreground Interactive language processing Language. : ENGLISH
5 Batch Submit job for language processing Appl ID . : ISP
6 Command Enter TSO or Workstation commands TSO logon : SYSPROC
7 Dialog Test Perform dialog testing TSO prefix: $III
IOF IOF Job and SYSOUT System ID : SYS4
MAX MAX MAX (V view E edit M pdf) MVS acct. : AAA
C Products Additional Products Release . : ISPF 5.7
L Local Local utilities/applications
USER user User application

Enter X to Terminate using log/list defaults

Option ==>
F1=Help F2=Split F3=Exit F7=Backward F8=Forward F9=Swap
F10=Actions F12=Cancel

```

Tips on This Panel

- To return the Option ==> to the top of the screen—change the default parameter in the Settings list. Place a zero in the option field and the following ISPF Settings screen will appear:

ISPF Settings

More: +

Options

Enter "/" to select option
 / Command line at bottom
 / Panel display CUA mode
 / Long message in pop-up
 / Tab to action bar choices
 Tab to point-and-shoot fields
 / Restore TEST/TRACE options
 Session Manager mode
 / Jump from leader dots
 Edit PRINTDS Command
 / Always show split line
 Enable EURO sign

Print Graphics

Family printer type 2
 Device name
 Aspect ratio . . . 0

General

Input field pad . . N
 Command delimiter . ;

Member list options

Enter "/" to select option
 / Scroll member list

Command ==>

F1=Help F2=Split F3=Exit F7=Backward F8=Forward F9=Swap
 F10=Actions F12=Cancel

Tips on This Panel

- To return the command line to the top of the screen, remove the / in the “Command line at the bottom” option (the default). Simply select the / and hit delete.
- The default setting places the cursor at the action bar. To change the default and place the cursor at the option field, remove the / from the “Tab to action bar choices” option.
- Hit F3 to exit the current panel.
- Having reset the options, your ISPF main menu will look like the one that follows for all future sessions.

```

Menu Utilities Compilers Options Status Help
-----
CIT/Titan Primary Option Menu
Option ==>
0 Settings Terminal and user parameters User ID . : $III
1 View Display source or listings Time. . . : 11:05
2 Edit Create or change source data Terminal. : 3278
3 Utilities Perform utility functions Screen. . : 1
4 Foreground Interactive language processing Language. : ENGLISH
5 Batch Submit job for language processing Appl ID . : ISP
6 Command Enter TSO or Workstation commands TSO logon : SYSPROC
7 Dialog Test Perform dialog testing TSO prefix: $III
IOF IOF Job and SYSOUT System ID : SYS4
MAX MAX MAX (V view E edit M pdf) MVS acct. : AAA
C Products Additional Products Release . : ISPF 5.7
L Local Local utilities/applications
USER user User application

Enter X to Terminate using log/list defaults

F1=Help F2=Split F3=Exit F7=Backward F8=Forward F9=Swap
F10=Actions F12=Cancel

```

PF Key Values

In the above panel display, F12 is set to cancel your session.

Review the PF key settings established by the software and reset them to meet your needs. Please note that the PF key settings are not necessarily consistent from panel to panel, therefore, it is a good idea to review the keys for panels you use with some frequency. Users who have customized PF keys to their own personal features will also have to reset them from the defaults established for Titan. The command keys should be entered at each panel to verify the default settings.

TSO Superset Utilities

Titan provides the TSO user with special utilities that can perform frequently required functions. The commands include: COPY, MERGE, LIST, FORMAT, and LISTJES. SORT functions interactively and prompts the user for input, output, and sort statements if none are provided. The sort will make all allocations. LISTJES is an alternative to the TSO OUTPUT command; it provides scrolling commands for viewing the output.

Logging Off

When you log off of TSO, you will return to the Application Selection screen (See Section 6.3). At this point, just close the window—click the X in the top right corner.

Note: If you type LOGOFF or hit PF3 from the Application Selection screen you will see the “IBM Session Manager for z/OS” screen. You cannot do anything from this screen. To return to the Application Selection screen, hit PF3.

Automatic Logoff

The automatic logoff interval for TSO, following a period of inactivity, is 2 hours.

Web Access to TSO Commands

Some TSO commands can be executed through the web. Open your browser to:

<http://titan.nih.gov/tsocmd>

You will be prompted for your Titan userid and RACF password.

Select a command from the drop-down menu, and then type in the name of the job or the data set name.

This web-based service is provided through SILK Web technologies. For information on other SILK Web services, see Section 7.6.1.

Canceling a TSO Session

If you have a frozen TSO session or a runaway CLIST, you can cancel your TSO session through the same web facility that allows you to execute TSO commands and cancel jobs. A TSO session is really just a special type of job. First, you must identify the TSO session; then you can cancel the session. Open your browser to:

<http://titan.nih.gov/tsocmd>

Identify your TSO Session

- For the COMMAND option —select “status” from the drop-down menu
- For the Job or Data Set Name option —type your Titan userid in the open field.
- Press “Enter” to Display Your TSO Jobs

A job or list of jobs will appear. For example:

```
JOB AAAAIII(TSU12443) ON OUTPUT QUEUE  
JOB AAAAIII(TSU22801) ON OUTPUT QUEUE  
JOB AAAAIII(TSU22843) EXECUTING
```

In this example, the third job on the list is the current TSO session—that is, the one marked EXECUTING. Make note of the job number, then click on the BACK button of your browser to return to the previous page. The first two jobs on the list above are older sessions.

Cancel Your TSO Session

- COMMAND—select “cancel” from the drop-down menu

Job or Data Set—type in your Titan userid. For example: AAAAIII(TSU22843)

Note: If there are several TSO sessions in the list, you must include the job number when you cancel your session. (Hint: just copy and paste the userid and job number from the list of jobs).

If you need assistance, contact the NIH Help Desk. See Section 5.2.1.

7.2.1 ISPF (Interactive System Productivity Facility)

ISPF, a software system available under TSO, extends the capabilities of TSO and provides increased performance. ISPF also includes interfaces to language processors, which can be invoked in the foreground, and extensive application testing facilities. ISPF consists of two major components, the Dialog Manager and the Program Development Facility.

Dialog Manager

The dialog manager (the application manager for ISPF) is used to develop formatted screens tailored to the user application. It can create applications using graphical user interfaces—including pop-up windows, action bars, and pull-down menus.

Program Development Facility (PDF), Also Known as SPF

The program development facilities can create or access a partitioned or sequential data set. In addition to program source statements and JCL, the data sets may consist of input data or text for any kind of processing or formatting program. The program development component includes:

- a full-screen editor
- forward, backward, and lateral scrolling
- an interface to data utilities for library, file, and data set maintenance
- foreground and background execution of language processors
- a facility for submitting batch jobs to JES2 for background processing
- an online tutorial
- split screen capabilities that permit the user to alternate between two functions as though two terminals were in use

Several additional products provide enhancements to ISPF:

- MVS/QuickRef - a “pop-up” quick reference tool (see Section 7.2.3)
- MAX - a collection of data and file manipulation programmer tools (see Section 7.2.2)
- User Display Facility (UDF) - a facility that allows users to display information about batch jobs. For additional information, see Section 7.2.4.

ISPF Logon and Logoff Procedures

To use ISPF, log on to TSO. (See Section 6.3 for the system selection procedures.) The system will automatically bring up the CIT/Titan Primary Option Menu. This is also the primary option menu for ISPF. To exit ISPF and get to the TSO READY prompt, type X at the command line.

ISPF Edit

ISPF provides a complete range of full-screen editing facilities including:

- scrolling forward, backward, or sideways through a data set and using the cursor to add, change, or delete characters anywhere on the display screen
- inserting, changing, or deleting lines anywhere in the data set, duplicating lines, and copying or moving lines from one place to another
- creating new data sets by entering new data or copying data from other data sets
- performing frequently used operations by use of Program Function (PF) Keys

ISPF Utilities

ISPF utilities are a group of full-screen, interactive commands that provide a variety of functions commonly required for effective processing. These commands are initiated and controlled during an ISPF session through easy-to-use menu selection panels. The major functions are:

- maintaining libraries, data sets, and catalogs
- moving and copying data
- resetting ISPF library statistics
- initiating hardcopy output
- displaying or printing VTOC entries for a disk volume
- browsing through and printing held SYSOUT data

For More Information

To learn more about ISPF facilities, try using the interactive tutorial. From the CIT/Titan Primary Option menu, select Help from the Action Bar on the top of the panel, and then choose Tutorial. CIT offers documentation on ISPF through the web. See Section 5.4 for more information.

7.2.2 MAX

MAX is a collection of data and file manipulation programmer tools for use under ISPF. MAX has the ability to browse and edit VSAM data sets and sequential data sets online. It permits formatted browsing and editing using COBOL copybooks. MAX also helps users

allocate or delete VSAM files. It eliminates ISPF's record length and file size restrictions. Other features include enhanced data set name lists, and a “cut and paste” option for records within one edit session or between edit sessions.

Access to MAX

Type MAX at the CIT/Titan Primary Option Menu.

For More Information

For additional information on MAX, consult the documentation offered by CIT. See Section 5.4 for ordering information.

7.2.3 MVS/QuickRef

MVS/QuickRef is a pop-up reference tool running under ISPF that allows users to look up information (e.g., on error messages, ABEND (Abnormal ENDing) codes, command structure) and get answers quickly online. The term “pop-up” in this context refers to MVS/QuickRef's ability to “pop up” over the current application and display information rapidly, no matter which ISPF application or panel is active.

Access to MVS/QuickRef

- Type QW directly at the ISPF command line.
- or
- Type C for Additional Products at the CIT/Titan Primary Option Menu. At the Additional Products screen, type Q.

7.2.4 User Display Facility (UDF)

The User Display Facility (UDF) allows users to display information about jobs processed by ThruPut Manager. If ThruPut Manager is delaying the execution of your job, UDF will allow you to display information such as hold reasons, job dependencies, and needed data sets.

Access

Type TMUSER at the ISPF command line.

For More Information

For additional information on UDF, consult the *Titan Batch Processing* manual. See Section 5.4 for information on the CIT publication service.

7.2.5 NIH WYLBUR

NIH WYLBUR is an interactive system, available on full-screen terminals, for batch job entry and tracking, coding and execution of command procedures, text editing, and document formatting, with features that simplify many data processing tasks. It runs under TSO.

NIH WYLBUR provides interactive access to disk data sets whose names begin with valid userid format. The commands are common English words (usually verbs) that describe the work to be done. The JES2 interface provides a remote job entry and remote job output (RJE/RJO) facility for submitting batch jobs, monitoring their job status, and manipulating by canceling, purging, or printing the job's input and output.

Access NIH WYLBUR in Several Ways:

- Type TSO WYLBUR on any command line within the CIT/Titan Primary Option Menu (ISPF).
- Type WYLBUR on the ISPF Command screen (option 6 on the CIT/Titan Primary Access Menu).
- Type WYLBUR at the TSO READY prompt.

Scrolling the Screen in WYLBUR

In WYLBUR you can scroll back to output that has disappeared off the screen by using the IBM Session Manager. Without Session Manager, the Titan full-screen mode would prevent scrolling back to previous output.

To use Session Manager:

- On the TSO/E LOGON screen, enter **sessmgr** as the value for Procedure.
- On the CIT/Titan Primary Option Menu, enter **x**.
You must exit ISPF to use Session Manager. It will not work under ISPF.
- On the TSO Session Output screen, enter **wylbur**.
You may begin using WYLBUR.

To return to ISPF after you have ended your WYLBUR session, enter **SPFMAIN**.

Follow these guidelines:

- Use F7 to scroll backwards and F8 to scroll forwards.
- You must define a set break character to be able to leave collect mode. For example:
set break BRK
You can then exit collect mode by entering BRK as the first characters on any line.
- The modify and retry commands are tricky to use because the cursors are not positioned properly.
- You may sometimes have to enter an extra carriage return to see your output.

For more information about Session Manager, refer to the *TSO/E User's Guide*. Go to the CIT publications web page (see Section 5.4) and select Time Sharing Option (TSO) under Titan.

7.3 CICS (CUSTOMER INFORMATION CONTROL SYSTEM)

CICS is a transaction server that supports many concurrent users and allows access to a diverse group of database files. It functions as a general-purpose database/data communications system that supports a variety of terminal types and web interfaces. CICS serves as an interactive interface between the user and the operating system.

Features

- executes by itself in a single-tier architecture or as either a client or a server in a multi-tier architecture
- interfaces with an external security manager to provide security to the data files, the transactions, and all of the required resources
- supports programs written in JAVA, ASSEMBLER, C, COBOL, and PLI
- functions with commercial software designed to use CICS as its communications interface

Applications that require CICS are subject to prior approval by CIT. The user and CIT jointly develop the protocols for accessing the user's application.

Access to CICS

From the Application Selection screen on Titan (see Section 6.3), enter the CICS region that you wish to access (CICSPROD or CICSTST1).

For More Information

For additional information on CICS, go to:

<http://titan.nih.gov>

Select Database services, then click on CICS.

For assistance, contact the NIH Help Desk.

7.4 DATABASE SYSTEMS

This section describes the database systems supported by Titan. For more information on database facilities supported at the NIH Data Center, connect to:

<http://titan.nih.gov>

and select Database Services. See Section 5.2.4 for information on database assistance.

7.4.1 Model 204

Model 204 is a database management system in which access structures, programs, and data are stored together. Model 204 provides a high degree of flexibility that encourages the use of application prototyping. This reduces the likelihood of structural changes to an application after it has become operational.

Every Model 204 file is a separate data set that consists of five tables. These tables contain directories of field names and attributes, data, inverted lists, and other control information.

Model 204 relationships are based solely on the value of data. Relating two or more records requires the existence of common data values within the records. Hierarchical and network relationships can be supported by this “commonality of data” characteristic.

Model 204 has its own easy-to-learn user language. It also provides interfaces to standard programming languages. Model 204 runs in batch mode as well as interactively.

Access

To access Model 204 on Titan, users must first have a valid Titan system userid and password. Account sponsors can then register users on their account for Model 204 through Web Sponsor (see Section 2.3).

Refer to Section 6.3 for general interactive access information. Registered Model 204 users can access Model 204 from the Titan Application Selection menu (see Section 6.3). The following example shows the commands that are used to log on and log off Model 204:

To sign-on: LOGON `userid`

To sign-off: LOGOFF

Users desiring to establish new Model 204 files should contact the NIH Help Desk.

Security Features

RACF protects data from unauthorized access. Model 204 has additional security features that include individual logon accounts and passwords, as well as file passwords for accessing secure files or groups of files.

Web Access

Model 204 can be accessed through the web using SILK (Secure Internet-LinKed) web technology. Web users can issue Model 204 commands, execute existing Model 204 programs and APSY subsystems, and create ad hoc queries. Go to:

<http://titan.nih.gov>

and select Database services, then Execute Model 204 Procedures.

Model 204 commands that can be issued from a web browser include:

- LOGWHO (list all active Model 204 users)
- DISPLAY (PROCEDURES and FIELDS)
- VIEW (ERRORS, PARAMETERS, and UTABLE)
- DELETE PROCEDURE

APSY subsystems, such as BUMPME (remove an active user from the online system), can also be used.

Users can invoke stored or ad hoc Model 204 procedures that return one-line reports, full-screen formatted reports, or print all information (PAI) unformatted reports. Output can be printed on a local or NIHnet-connected printer, or viewed from the browser. For more information on SILK, see Section 7.6.1.

7.4.2 IMS (Information Management System)

IMS (Information Management System) is a database/data communication (DB/DC) facility that supports user-written batch processing and teleprocessing applications. Using the IMS facilities in a combination of batch and teleprocessing modes permits the efficient and orderly development of data management applications. IMS user application programs may be written in Assembler Language, COBOL or PL/I.

IMS is a hierarchical database management system. It is appropriate for very large databases that will be accessed by many users at one time. A professional database administrator or programmer must set up the database's structure and keep track of implementation. Requesting a report with information formatted or selected in a new way requires extensive applications programming and cannot be done on short notice.

The database management facility of IMS is also referred to as Data Language/One or DL/I. The Batch Terminal Simulator (BTS II) is designed to operate as a batch program and provides a comprehensive development and debugging tool for IMS applications.

The NIH Administrative Database (ADB), which is used for several NIH business functions, is maintained in IMS. ADB users must register with the Administrator of the Administrative Database so that the proper account can be billed for the IMS resources consumed and the appropriate IMS security can be assigned.

Access

IMS can be accessed using QWS 3270 Secure. QWS3270 Secure instructions contain separate configuration directions for IMS/ADB users to allow them to connect directly to IMS. If you use QWS3270 Secure, set the "Port" to 2324 for the direct encrypted connection to IMS.

For further information on QWS 3270 Secure, see Section 6.3.1. Any problems in using IMS or interfacing with it should be directed to the NIH Help Desk.

Use of IMS is restricted to projects approved by the NIH Data Center. This restriction is necessary because the data center's capacity to deliver the quantity and quality of support required by IMS is limited. For more information, contact the NIH Help Desk.

For More Information

IMS documentation is available from the CIT publication service. See Section 5.4.

7.4.3 Relational Database Services

The NIH Data Center offers relational database systems, including IBM DB2 on Titan. Relational database systems are provided in an environment where users can manage their own databases and applications. Other relational database systems supported by CIT include Microsoft SQL servers on the Windows platform and Oracle on the hosted Unix platform.

For more information on relational database systems, go to:

<http://titan.nih.gov>

and select Database services.

7.4.3.1 DB2

DB2 is a relational database management system (RDBMS) that can be used to manage a wide variety of data, including images, audio, and video. DB2 is especially effective at handling data that need to be stored securely, data that need to be manipulated and analyzed interactively, and data that are the basis for one-time and recurring reports. Data input, update, storage, security, extraction, analysis, and report generation are all facilities of DB2.

The DB2 server is a high-performance database engine capable of handling large amounts of data and many concurrent users. It has comprehensive backup and recovery facilities and excellent security. DB2 houses a variety of NIH enterprise-wide data including administrative, grants, personnel, and research data.

In DB2, data is stored in the form of tables (relations) comprised of rows (records) and columns (fields). All access to and manipulation of data in DB2 is accomplished via Structured Query Language (SQL). SQL provides a relatively simple English-like language for retrieving (selecting) and manipulating (inserting, updating, and deleting) data.

Access

Any registered Titan user can create, access, and manipulate data in DB2. DB2 data is accessible interactively via client/server connectivity (including the web) or an online (full-screen 3270) connection. It can also be accessed through batch jobs.

For More Information

For more information regarding DB2 on Titan, go to:

<http://silk.nih.gov/dbtek/db2doc>

7.4.3.2 Using Titan as an Oracle Client

Titan provides the connectivity software that allows Titan users to access Oracle databases residing on other server environments. Titan sends a request to an Oracle database, where it is processed. The Oracle database then sends the result back to the Titan user. There are batch cataloged procedures (procs) on Titan to facilitate making the requests to Oracle databases. CIT also offers hosting and management of Oracle relational databases on the CIT hosted Unix (EOS) systems (see Section 1.1.1.1).

For More Information

For more information on using Titan as an Oracle client, go to:

<http://titan.nih.gov>

and select Database services. Then, click on Using Titan as an Oracle Client.

7.5 PROGRAMMING LANGUAGES

The NIH Data Center supports a number of programming languages, offering a wide range of capabilities.

For More Information

For further information, refer to the *Titan Batch Processing* manual and the documentation for the individual programming languages available from the CIT publication service. See Section 5.4 for information on the CIT publication service. Contact the NIH Help Desk (see Section 5.2.1) if you need assistance.

7.5.1 COBOL

Common Business Oriented Language (COBOL) is used for non-scientific applications. The version of COBOL on Titan is compatible with the American National Standards Institute (ANSI) standard and contains a number of IBM extensions. COBOL is based on a well-defined, restricted form of English.

Access

The COBOL compiler is available interactively (foreground) from TSO/ISPF and in batch (background) mode. The TSO/ISPF COBOL compiler is found in ISPF panel 4.2 for foreground and panel 5.2 for batch.

7.5.2 VS FORTRAN

FORTRAN is one of the most commonly used languages for scientific and engineering applications. The VS FORTRAN compiler is available on Titan. The VS FORTRAN compiler meets the 1978 ANSI standard (also known as FORTRAN 77).

Access

The VS FORTRAN compiler (Version 2 Release 3.0) is available interactively from TSO/ISPF and in batch mode. The TSO/ISPF VS FORTRAN compiler is found in ISPF panel 4.3 for foreground and panel 5.3 for batch.

7.5.3 PL/I

PL/I is a multi-purpose language used in business and scientific applications. PL/I contains most of the capabilities of FORTRAN and COBOL as well as some additional features.

Access

The Titan PL/1 compiler is available interactively from TSO/ISPF and in batch mode. The TSO/ISPF PL/1 compiler is found in ISPF panel 4.5 for foreground and panel 5.5 for batch.

7.5.4 High Level Assembler

The IBM Operating System High Level Assembler is a symbolic programming language used to write programs for the IBM mainframe system. The language provides a convenient means for representing the machine instructions and related data necessary to program the IBM mainframe system. Assembler Language is generally used for system programming where machine-dependent operations are required that cannot be performed using one of the higher-level languages such as COBOL or FORTRAN. The Assembler program processes the language, provides auxiliary functions useful in the preparation and documentation of a program, and includes facilities for processing the Assembler macro language.

Access

The Titan Assembler compiler is available interactively from TSO/ISPF and in batch mode. The TSO/ISPF Assembler compiler is found in ISPF panel 4.1 for foreground and panel 5.1 for batch.

7.5.5 REXX

REXX (Restructured EXtended eXecutor), which runs under TSO, provides a fully functional application development environment, including structured programming techniques, logical and arithmetic operations, and communication with the TSO end user. REXX features a choice of compiled or interpretive execution, convenient built-in functions, free-format coding, debugging capabilities, and very extensive parsing and character string manipulation.

The REXX Compiler and Library allow users to translate frequently used routines into compiled REXX programs. The REXX Library also contains common routines that are accessible to all compiled REXX programs.

The REXX documentation is available from the CIT publication service (under the TSO category). See Section 5.4.

Access

The Titan REXX compiler is available interactively from TSO/ISPF and in batch mode. The TSO/ISPF REXX compiler is found in ISPF panel 4.14 for foreground and panel 5.14 for batch.

7.5.6 C/C++

The C language is a general purpose programming language. The C++ language is based on the C language and supports object oriented concepts.

Access

The Titan C/C++ compiler is available in batch mode.

7.6 SILK WEB TECHNOLOGIES

SILK (Secure Internet-Linked) web technologies (based on the Shadow Web Server) were developed for users of the NIH Data Center. Users can take advantage of SILK Web technologies to access any sequential data set or PDS member from a web browser, download files, issue TSO commands, change RACF passwords, locate a user or the account sponsor, and perform many other functions.

The data may be any type of output supported by web browsers—including plain text, html, gif, jpeg, or other binary files. All SILK reports are protected by RACF, the IBM mainframe security software.

The hosted Unix (EOS) platform provides SILK Web facilities for easily building applications to obtain, examine, update, and store information using web browsers. SILK technologies permit applications to be implemented on the platform that is most appropriate for their requirements.

For More Information

For more information, go to:

<http://titan.nih.gov>

Contact the NIH Help Desk (see Section 5.2.1) if you need assistance.

7.6.1 SILK Web-Based Services

There are many important Titan services that are available via SILK Web pages. Web RACF allows users to perform RACF functions (see Section 4.6.4). Web Sponsor is a tool for account officials to make changes to accounts and display information (see Section 2.3).

Users can view documents on SILK servers on their personal computers, then download or print them on local or NIHnet-connected printers.

The following figure provides a summary of many of the SILK-based services.

Figure 7-1. SILK-Based Services for Titan

Service	Address
General NIH Applications	
Customer Locator	http://silk.nih.gov/locator (requires NIH Login) http://silk.nih.gov/locator (requires Titan login) (See Section 1.3.2.2)
Human Resources Information and Benefit System (HRIBS)	http://silk.nih.gov/hribs/display
Accounts	
Password Reset	http://silk.nih.gov/passwordset (See Section 2.2, 4.6.1) (requires NIH Login)
Web Sponsor	http://websponsor.cit.nih.gov (See Section 2.3.)
Web Sponsor via NIH Login	http://websponsor.cit.nih.gov/nihlogin (See Section 2.3.)
Connectivity	
NIH Connectivity Tools	http://silk.nih.gov/SECURSLK/tcptools/tcptools.html
Mainframe	
Job Scheduler	http://titan.nih.gov/job/scheduler (See Section 9.6.)

Service	Address
Security (RACF)	https://titan.nih.gov/racf (See Section 4.6.4.)
TSO Commands	http://titan.nih.gov/tsocmd (See Section 7.2.)
Utilities	http://silk.nih.gov/silk/silkinfo/utilities.html
Disk Space Allocation/Cost Procedure	http://titan.nih.gov/dbtek/diskcalc
Display or Purge Jobs	https://titan.nih.gov/util/dispjog (See Section 9.6.)
Easymail	http://titan.nih.gov/easymail (See Section 7.9.1.)
Formsmail	http://silk.nih.gov/formsmail/doc (See Section 7.9.2.)
Manage Migrated Data Sets	http://silk.nih.gov/oldmigr (See Section 10.1.1.2.)
Purchase Tape	http://silk.nih.gov/purchase-tape (See Section 10.2.5.)
Secure File Transfer	https://silk.nih.gov/dbtek/sslft (See Section 6.4.2.)
View or Download Mainframe Public Data Sets	http://titan.nih.gov/silkad/pubutil (See Section 7.6.2.5.)
View or Download Mainframe Private Data Sets	http://titan.nih.gov/silkad/privutil
Web Listoff	http://titan.nih.gov/listoff (See Section 8.3.)
Web Submit	http://silk.nih.gov/submit (See Section 9.6.)
VPS Printing	http://silk.nih.gov/silk/vps/ (See Section 6.5)
Database	
Database Technologies (IBM DB2, IMS, Microsoft SQLServer, Oracle and Model 204)	http://titan.nih.gov (See Section 7.4.)
DB2 EZStart	http://silk.nih.gov/dbtek/ezstart
web SQL Processor for DB2	http://silk.nih.gov/dbtek/sqlproc?first=YES

Service	Address
SILK Servers	(See Section 7.6.2.)
Create and Manage Customized Servers	http://silk.nih.gov/msilk (See Section 7.6.2.4.)
Public Server	See Section 7.6.2.1.
Secure Server	See Section 7.6.2.2.

7.6.2 SILK Web Server Options

There are three SILK Web server options available for Titan that allow users to display mainframe data:

- a public server (displays files to anyone with a browser)
- a secure server (displays files to a limited group of viewers)
- a customized server (set up and managed by the user to display mainframe files or files uploaded from the owner's workstation)

Creating Links

You can use public, secure, and customized servers to view Titan data sets from the web by creating a link such as:

```
http://titan.nih.gov/secure/dsname
http://titan.nih.gov/public/dsname
http://titan.nih.gov/silk/myserver/mypage
```

where:

- “dsname” is your data set name (see Section 7.6.2.3 for data set format and naming information)
- “myserver” is the name you give to your server
- “mypage” is the name you give to the web page

The owner of a mainframe data set controls access to the data set being displayed. Access can be “universal” or restricted to individuals or groups by using mainframe RACF commands. SILK data sets are mainframe data sets with full RACF protection—they can be made as secure as any other mainframe data set.

For more information concerning SILK Web technology on Titan, call the NIH Help Desk.

7.6.2.1 Public Server

This server contains data available to anyone with browser software and an Internet connection. Data sets for public access should be defined in RACF with “UACC=READ.”

Type `http://titan.nih.gov/public/` in your browser address window, followed by the name of the data set that you want to view.

For example:

`http://titan.nih.gov/public/userid.@WWW.MYDATA`

For information on creating and naming data sets for the public server, see Section 7.6.2.3.

7.6.2.2 Secure Server

Anyone viewing data sets using the Titan SILK secure server must supply a valid Titan userid and RACF password. The userid will be checked for RACF authority to read the data set. It is the data set owner's responsibility to establish and maintain appropriate RACF control of web accessible mainframe data sets. The secure server uses RACF to control access to stored data.

Type `http://titan.nih.gov/secure/` in your browser address window, followed by the name of the data set that you want to view.

For example:

`http://titan.nih.gov/secure/userid.@WWW.MYDATA`

For information on creating data sets for the secure server, see Section 7.6.2.3.

7.6.2.3 Mainframe Data Set Format

Creating Data Sets for the Public and Secure Servers

In order to display the data set via SILK:

- Create a data set on the Titan system following the naming conventions described below.
- If you are using WYLBUR, specify the HTML option of the WYLBUR SAVE command. The HTML option allows you to save any text data in a format compatible with the SILK Web server.
- Set the level of RACF control for the data set. This determines the access limitations.

Naming Data Sets for Public and Secure Servers

The naming conventions require the following elements:

- a Titan userid
- “@www” as a qualifier. The “@www” naming convention adds an additional layer of security because it prevents web access to other mainframe data sets.
- the correct suffix

Suffix	Meaning
HTM or HTML	HTML code
GIF, JPG, JPE or JPEG	GIF or JPEG graphics file
DSNCC	mainframe format with printer control characters in column 1
none	the default is text

Examples of web-enabled Titan data sets are:

```
userid.@WWW.MYDATA
userid.MYDATA.@WWW.HTM
```

Viewing Data Sets on Public and Secure Servers

- Open a web browser to the SILK Web page (<http://titan.nih.gov>).
- Then type either “public/” or “secure/” (without quotes) depending on the level of RACF control set for the data set.
- Add the full data set name of the data set. Refer to the examples in Section 7.6.2.1 and Section 7.6.2.2.
- Display, download, or print that data set.

The NIH Data Center takes care of all server maintenance. All you need are a few simple lines of html code stored on the mainframe.

Graphics Files (all servers)

If you want to display a graphics file (e.g., a GIF or JPEG file); upload the file from your desktop computer, via FTP, using binary format. Specify RECFM VB, LRECL 255, BLKSIZE 23476 on the mainframe. Make sure the file conforms to the naming requirement described above. Specify an extension of GIF for a GIF file, and JPEG, JPE, or JPG for JPEG files.

7.6.2.4 Customized Servers

Customized SILK servers allow users to create and manage their own full-function SILK Web server without having to purchase and maintain hardware or software. The NIH Data Center takes care of all server maintenance. The operating system for a customized SILK server is transparent to the user. A customized SILK server can be set up by anyone with a CIT Titan (mainframe) userid, a web browser, and an e-mail address. You can upload pages directly from your desktop computer using SILK's file transfer facility. You can also access data sets stored on Titan through a customized SILK server. For information on linking mainframe data sets to pages on a customized SILK server, see below.

SILK Web server owners can define and control access to their servers—providing the basis for a corporate intranet facility. There are three access security levels:

- “unrestricted” (for anyone with a web browser)
- “registered users” (limited to CIT users)
- “designated users” (The owner designates the specific CIT userids that will have access privileges).

SILK server owners can choose to apply an optional “group password” available to all three levels of access. In addition, Secure Sockets Layer (SSL)/Transport Layer Security (TLS) protection provides for data encryption across the network.

To set up a customized SILK server, go to:

<http://titan.nih.gov>

and choose Create and Manage Customized Servers (under SILK Servers). At the Customized Servers page, select Create Server and enter a name for the server. When you set up a SILK Web server, you must comply with your agency's web server policies. If you are associated with NIH, you will have an opportunity to read the NIH server policies. A server will not be created until after you have indicated that you have read and understood your agency's policies.

Once you have created the server, you can make changes to it, such as adding a co-owner, changing the name or description of the server, changing the security level, adding the server to a registry of SILK servers, etc. Go to the Customized Servers page, look in the Manage Server area, and click on the name of the server that you wish to change. To upload files to your customized SILK server, go to the Customized Servers Page, scroll down, and select the File Transfer Facility. You can also link mainframe data sets to your customized SILK server. For detailed information, see below.

Customized Servers with the SSL/TLS Encryption Option

SILK servers can take advantage of SSL/TLS encryption. SSL encryption protects the data being transferred between the web server and the web browser. The data that are transferred are encrypted, and therefore not visible as they travel across the network. To include the SSL

feature for your customized SILK server, check the SSL box on the Manage Server page. There is an additional charge for using the SSL option. See Section 3.1 for charging information.

Linking Mainframe Data Sets to Pages on a Customized SILK Server

SILK Web's customized servers allow users to associate mainframe data sets with web pages (URLs) on a customized SILK server. Owners of SILK customized servers can go to:

<http://silk.nih.gov/msilk>

to see a list of all their SILK customized servers. To associate a page on the server with a data set stored on Titan, do the following:

- Click on a server name.
- Choose the option “Add a page using an existing Titan file.”
- Type the name for the page on your SILK server and click the “Add” button.
- On the form that is displayed, type the data set name to be associated with the web page.
- Select the appropriate document type for the web page from the drop-down list box.

Document type	Description
“text/html”	for data sets containing html tags
“text/plain”	for data sets containing text only
“dataset/cc”	for data sets containing text with a carriage control (cc) character in column 1
“suffix”	for data sets that have a document type as the last qualifier in the data set. With the “suffix option” the web page name aaaaiii.mypage.html is interpreted as “text/html” whereas aaaaiii.myimage.gif would be interpreted as “image/gif.”

- Select the “Create” button.

Example:

If you have a server called “Personnel,” you can create a web page for that server called “Leave.” Associate the data set aaaaiii.hr.leave (where aaaaiii is your Titan userid) by following the instructions above. Each time a browser requests <http://silk.nih.gov/silk/personnel/leave>, your customized server will display the contents of the mainframe data set aaaaiii.hr.leave.

(The initial part of web addresses—<http://silk.nih.gov/silk/personnel/>—is not included in the following examples.)

Additional Information for Partitioned Data Sets

SILK allows users to link a web page to a member of a partitioned data set (PDS).

Example:

You can create a web page called “policies/overtime” and associate it with a member of the partitioned data set “aaaaiii.hr.policy(ot).” Note that the web page name can contain a “/” to indicate subdirectory.

Wildcards in Web Addresses

SILK permits web page addresses containing wildcards. Wildcard pages use “*” to indicate a value that will be determined by the URL requested. A portion of the page name determines the mainframe data set name to be displayed. With wildcard web pages, you do not have to manually associate each web page with a specific data set.

Examples:

A web page called “Vacancies/*” can be associated with the mainframe data set “aaaaiii.vac.*”. When someone types the full web address into the browser window, the portion corresponding to the “*” will be substituted into the “*” in the data set name. If the incoming web address is vacancies/tech/cs001, then the mainframe data set “aaaaiii.vac.tech.cs001” is displayed. **Note:** a “/” in the web address is automatically converted to a “.” in the data set name.

The web page name called “Training/*” can be associated with a member of a mainframe partitioned data set “aaaaiii.train.course(*)”. Whenever the web address training/crs1234 is requested, the corresponding data set “aaaaiii.train.course(crs1234)” would be displayed.

Data Set Security

The NIH Data Center strongly recommends the use of RACF profiles to protect the mainframe data sets that you display on the web from unwanted access. See Section 4.6.3 for further information.

7.6.2.5 View/Download Utilities for Public or Private Data Sets

These utilities display mainframe data sets ending in .txt, .dsncc, .gif, .jpg, and other (nonspecific) data set names. It also downloads data sets that end in .exe .doc .xls or .zip.

View or Download Mainframe Public Data Sets

Anyone with a browser and an Internet connection can view or download a Titan data set. The owner of the data set must first define the data set in RACF with “UACC=READ.”

Go to:

<http://titan.nih.gov/silkad/pubutil>

and enter the name of the data set.

View or Download Mainframe Private Data Sets

To view or download these data sets, you need a Titan userid and password in addition to the browser and Internet connection. The userid will be checked for RACF authority to read the data set. It is the data set owner's responsibility to establish and maintain appropriate RACF control of web accessible mainframe data sets. RACF controls access to the stored data.

Go to:

<http://titan.nih.gov/silkad/privutil>

7.6.3 Web Interfaces for User Applications

Creating a web interface for your mainframe applications makes them accessible with the easy-to-use features of a browser. The mainframe's RACF facility provides complete security for your data, and only authorized accounts will be allowed to see your web data. Using SILK Web interfaces you can:

- store reports on the mainframe in web-enabled formats
- limit access to information to the appropriate accounts
- initiate queries from the web to run against mainframe databases
- view the results of queries through the browser

Contact the NIH Help Desk for more information.

7.7 SCIENTIFIC STATISTICAL SYSTEMS

The following statistical software packages are available on Titan:

- BASE SAS - foundation of the SAS system (see Section 7.7.1)
- SAS/ACCESS Software for Relational Databases - DB2 interface
- SAS/ACCESS Software for Relational Databases - Oracle interface
- SAS/AF - application facility
- SAS/CONNECT - cooperative processing product
- SAS/ETS - econometric and time series procedures
- SAS/FSP - full screen procedures
- SAS/GRAPH - SAS graphic subsystem
- SAS/IML - Interactive Matrix Language
- SAS/OR - operations research tools

-
- SAS/QC - SAS quality control
 - SAS/SHARE - provides concurrent access to data
 - SAS/STAT - advanced statistics procedures
 - BMDP - Biomedical computer programs (P series) (See Section 7.7.2)
 - IMSL - International Mathematical and Statistical Library
 - SPSS - Statistical Package for the Social Sciences (See Section 7.7.3)

For More Information

Contact the NIH Help Desk for more information on statistical packages or visit these web sites:

<http://statsoft.nih.gov>

<http://sdp.cit.nih.gov/downloads/stats.asp>

CIT provides documentation on these services via the CIT publication service (see Section 5.4).

7.7.1 SAS

The SAS System is an integrated system of software products for performing tasks such as data entry, data retrieval, data management, report writing, graphics, statistical and mathematical analysis, business planning, business forecasting, business decision support, operations research, project management, quality improvement, and applications development. SAS builds and operates on SAS data sets, VSAM files, sequential files DBMS tables (DB2, Oracle, and others), MS Excel, and MS Access. In addition to the basic SAS system, there are many other products in the SAS suite available on Titan. See Section 7.7 for the appropriate web site.

TSO CLISTS

SAS is also available interactively under TSO through the following CLISTS:

%SAS	for initial entry into the system
%SAS GO	to reenter the system during the same TSO session
%SUPPORT	gives the entry into SAS NOTES and SAS SAMPLE libraries through a menu-driven facility

Access

To access SAS, select L (Local) from the CIT/Titan Primary Option Menu, and then select the SAS option.

If you need assistance, contact the NIH Help Desk. See Section 5.2.1.

7.7.2 BMDP

BMDP is a library of statistical analysis programs that were originally developed at the UCLA Health Sciences Computing Facility. The programs are self-contained and use an English-based control language. Emphasis is placed on determining the validity of underlying statistical assumptions and on identifying implausible values. Many of the analysis features cannot be found in other statistical analysis systems.

Use the BMDP procedure in SAS programs to:

- call a BMDP program to analyze data in a SAS data set
- convert a SAS data set to a BMDP “save” file

For assistance, contact the NIH Help Desk. See Section 5.2.1.

7.7.3 SPSS

SPSS provides capabilities for extensive file handling and data management tasks, including advanced statistical analysis procedures (e.g., discriminate analysis, nonlinear and logistic regression analysis, and multivariate analysis of variance). SPSS runs on Titan in batch mode. CIT also supports many SPSS products on Windows and Mac operating systems.

7.8 INTERACTIVE OUTPUT FACILITY (IOF)

The Interactive Output Facility (IOF) provides users with complete access and control over their generated print spool output and input batch jobs. IOF lets users track the progress of a job and view the output. There is a tutorial (Quick Trainer) and a help screen at every panel when viewing the printed output, selected portions, or components of a spooled job. In the basic TSO environment, IOF will also run from the READY prompt.

Access

To use IOF, do one of the following:

- Select IOF from the CIT/Titan Primary Option Menu.
- Enter IOF at the TSO READY prompt.
- Type IOF at the TSO/ISPF command line.

For More Information

For additional information on IOF, consult the *Titan Batch Processing* manual and other documentation offered by CIT. See Section 5.4 for more information.

7.9 TITAN E-MAIL SERVICES

Users can send e-mail through the Titan system using a web (Easymail and Formsmail) or batch (Sendmail) interface. Titan does not have a facility that allows users to receive e-mail.

Note: The electronic mail service supported by CIT is the NIH Central Email Service (CES). The CES provides e-mail, scheduling, and other messaging services to the NIH community. NIH users are encouraged to take advantage of this service. There is no direct charge for CES to NIH ICs. Contact the NIH Help Desk for further information, or go to:

<http://www.mail.nih.gov>

7.9.1 Easymail

Easymail allows Titan users to send e-mail from the web. Among the options you can specify are:

- multiple addresses (To:)
- copies (CC:)
- an alternate return address for replies—the address where you receive your e-mail

To use Easymail, go to:

<http://titan.nih.gov/easymail>

and log on with a Titan userid.

web page developers can add e-mail to their pages using a hypertext link to Easymail. To invoke Easymail from a web page, use the following HTML coding:

```
<a href="http://titan.nih.gov/easymail">  
Send e-mail</a>
```

Clicking the “Send e-mail” link displays the Easymail form.

You can also have e-mail sent to a pre-specified e-mail address by including “?to=” in the HTML (hypertext markup language) coding. For example, to send e-mail to the “webmaster@my.site.gov” address, include the following code:

```
<a href="http://titan.nih.gov/easymail?to=webmaster@my.site.gov">  
Send e-mail to Web Master</a>
```

In this case, the Easymail form would be initialized with “webmaster@my.site.gov” as the To: address. **Note:** the person sending the mail must have a Titan userid to access Easymail.

7.9.2 Formsmail

Formsmail is a SILK Web facility that sends information collected using an online web form directly to a specific, predetermined e-mail address. With Formsmail, a registered user can set up a form on any web server (including SILK Web customized servers) and receive the resulting information via e-mail. For more information go to:

<http://silk.nih.gov/formsmail/doc>

7.9.3 SENDMAIL Procedure

The SENDMAIL utility is a batch procedure used for sending e-mail from Titan. Refer to the *Titan Batch Processing* manual for a full description of this procedure.

7.10 FILE MANAGEMENT SYSTEMS

The following file information systems run on Titan, but receive limited support from CIT.

7.10.1 VISION:Builder

VISION:Builder (previously known as MARK IV) is a general-purpose file management and reporting system. The system can process multiple coordinated input files, create multiple output files, update or create a new master file, retrieve data by selection criteria, and produce multiple user reports with summary statistics, all in a single pass of the master file.

VISION:Builder supports fixed and variable length sequential and virtual sequential (VSAM) files. The system is easy to use due to system defaults and automatic operations.

VISION:Builder is adaptable to most commercial data processing applications.

Access

VISION:Builder runs in batch mode using standard JCL or interactively from TSO/ISPF. At the CIT/Titan Primary Option Menu, select C for Additional Products, and then select VI for VISION:WorkBench Facility for interactive execution. This product is not fully supported by CIT. Use it at your own risk.

7.10.2 IRS

IRS is a general batch-oriented information management system. It provides the user with a fast, efficient, easy-to-use technique for extracting information from computer files, performing basic data processing operations, and producing printer, tape, and disk output. IRS runs in batch mode only. IRS is an older product that is not fully supported by CIT. Use it at your own risk.

7.11 DOCUMENTATION SOFTWARE

IBM BookManager Online Documentation System

Titan supports IBM BookManager for viewing online documentation such as user's guides, product specifications, maintenance manuals, procedures manuals, vendor's publications, reports, articles, and bulletins.

Online information has the familiar book appearance on the viewer's display screen, and allows you to:

- open to a specific place in the book
- scroll forward and backward
- use the table of contents and index
- go directly to any chapter or topic
- group books on a bookshelf
- link to other books (hypertext)

Access

To browse the BookManager Bookshelf List, which includes IBM manuals, go to the CIT/Titan Primary Option Menu. Select C for Additional Products, and then select B for Books.

CIT only supports the READ function of BookManager. For additional information on IBM BookManager, contact the NIH Help Desk.

8 PRINTING SERVICES

This section introduces the facilities for producing printed output from Titan. Printing services are available through batch jobs, NIHnet connections to local printers, and the web. Titan printing options include high-speed laser printing on continuous forms, cut-sheet laser printing, and slower impact printing services. CIT encourages users to take advantage of the more reliable, energy-efficient, cut-sheet duplex printing option whenever possible.

See Section 11.1.1.3 for the specifications for the printers at the central facility.

8.1 CENTRAL PRINTING THROUGH BATCH JOBS

The *Titan Batch Processing* manual includes a comprehensive description of printing services for Titan through batch jobs, including the following topics:

- job control language (JCL) statements used by batch jobs to select output options
- forms for laser and impact printing
- labels
- user-supplied forms
- character sets
- hexadecimal tables for character sets
- carriage control
- form control buffers (FCBs)
- table reference characters (TRC)
- Hardcopy utility of ISPF

Hint: as an alternative to printing job output, you can copy job output to a data set using the FETCH procedure, described in the *Titan Batch Processing* manual.

OUTPUT HOLD

All jobs in OUTPUT HOLD on Titan are purged (except for SYSOUT=I which is printed) after 7 calendar days—this includes weekends. Jobs awaiting output for more than 14 calendar days will be purged even if routed to a remote printer or another NJE node. Refer to the *Titan Batch Processing* manual for information on SYSOUT classes. (See Section 5.4 for information on how to access CIT documentation).

For More Information

For further information on printing through batch job submission, consult the *Titan Batch Processing* manual or contact the NIH Help Desk. See Section 5.2.1.

8.1.1 Jobs Run at Other NJE (Network Job Entry) Nodes

Users who run jobs at other NJE nodes and then route the job to print on Titan must add the following statements after their JOB statement:

```
/*JOBPARM ROOM=bbbb  
/*NETACCT userid
```

where “bbbb” is the box number for the output and “userid” is the Titan userid. To specify a Parklawn output box, place the letter “P” before the box number. Without the /*JOBPARM ROOM=bbbb statement, your output may not print, may go to the wrong box, or may be discarded. If there is no /*NETACCT control statement—or if the Titan userid on the NETACCT statement has not been registered to use NETACCT—then the SYSOUT from the non-NIH node will be rejected by Titan. The SYSOUT will be sent back to the sending node.

Refer to Section 6.6 for more information on Network Job Entry.

8.1.2 Output Delivery

All Titan output is printed at the NIH Bethesda site. Output printed on the central printers must have a box number associated with the job. See Section 5.6 for more information on output distribution services including how to specify a box number for your job.

When the machine room operators sort the output, it is placed in the box corresponding to that number in building 12A at NIH. **Note:** users must make their own delivery arrangements for output designated for Parklawn (“P” preceding the box number).

8.2 NETWORK PRINTING SERVICE

Users can print output from Titan to printers accessible via NIHnet or the Internet using the VPS printing service. The output goes to printers attached to a PC, Mac, workstation, or local area network (LAN) connected to NIHnet and running an LPD server. AppleTalk printers are supported in conjunction with the PrintShare services provided by CIT. See Section 6.5 for more information on VPS.

8.3 PRINTING FROM THE WEB

Using SILK's Web Listoff facility, you can print Titan data sets through the web. Any non-VSAM data set—except those in WYLBUR edit format—can be listed offline. Since all data set access is controlled by RACF (see Section 4.6), you can only print the data sets that your userid has authority to read.

To print a data set through the web, go to:

<http://titan.nih.gov/listoff>

Enter your userid and password in the browser security window. When the form appears, specify the data set name and the following options for listing offline:

- box number
- title
- remote printer number or name (VPS printer)
- number of copies
- hold (optional)
- form (optional)
- character set (optional)

Once you submit the form, the screen will display the number of the batch job that will actually create the listing. You will be able to pick your listing at the specified output box (see Section 5.6.1) or a VPS printer.

9 BATCH JOB SERVICES

The batch processing facility of the Titan system allows users to submit a job or computer program to the mainframe system. The NIH Data Center provides an extensive set of batch utility programs to aid the user in the areas of data management and manipulation. Users can print job output or examine it at their desktop workstations. Refer to Section 9.6 for information on managing batch jobs through the web.

For More Information

Refer to the manual *Titan Batch Processing* for complete information on running batch jobs, methods of submission, job class summaries, job turnaround times, job control language statements, and the procedures for using batch utility programs and cataloged procedures. CIT also provides other documentation related to batch processing. See Section 5.4 for information on viewing and ordering documentation.

9.1 OPERATING SYSTEM OVERVIEW

The z/OS Titan mainframe operating system introduces programs to the computing system, initiates their execution, and provides all the resources and services necessary for the programs to carry out their work. The operating system is made up of a general library of programs that can be tailored to meet many requirements. The installation can select the systems programs that it needs, add its own programs to them, and update existing programs as needs change.

For illustrative purposes, the programs and routines that compose the operating system are classified as a control program and processing programs. The control program:

- accepts and schedules jobs in a continuous flow (job management)
- supervises each unit of work to be done (task management) on a priority basis
- simplifies retrieval of all data, regardless of the way it is organized and stored (data management)

The processing programs define the work that the computing system is to do and simplify program preparation. Processing programs consist of:

- language translators (such as the FORTRAN compiler)
- service programs (such as the Binder)
- problem programs (such as users' programs)

For a description of the Titan operating system, see Section 7.1.

9.2 JOB CONTROL LANGUAGE OVERVIEW

Job Control Language (JCL) is the means by which the user communicates the resource requirements for a job to the operating system and various components of the mainframe system. Through JCL, the user instructs the computer on what to do with programs, data sets, and I/O devices.

ThruPut Manager

Titan uses software called ThruPut Manager to convert JCL from the former NIH mainframe systems to run on Titan. It recognizes the format of an incoming JOB statement, converts the JCL, and directs output to the appropriate printers. ThruPut Manager also controls the flow of jobs on Titan. When a job needs tapes, it schedules the job accordingly. For additional information on batch processing and job control language for Titan, refer to the *Titan Batch Processing* manual.

9.3 JOB CLASS SUMMARY

Jobs are assigned to execution classes based on the system resources requested. There are two execution classes on Titan:

- L for Long – This is the default class. Class L has a default CPU time of 999 seconds (16 minutes and 39 seconds) and a maximum time of 999 minutes.
- X for eXpress – Class X has a default and maximum CPU time of 100 seconds (1 minute and 40 seconds). In general, jobs that execute in Class X receive a higher scheduling priority than jobs that execute in Class L.

9.4 JOB TURNAROUND

When a job has completed execution, it enters a queue to be printed or it is placed in OUTPUT HOLD (from which the user can selectively examine the output at a workstation). Use IOF (see Section 7.8), the web-based Display or Purge Jobs facility (see Section 9.6), or WYLBUR, to track the progress of a job, review the output, or purge the job.

Output turnaround is from the time a job enters the print queue until the output has been placed in the user's output box. For information on output boxes, see Section 5.6.1. Time can vary widely depending on the services chosen. For jobs printed at the central facility with the standard printing requirements, the time for the job to be printed, separated from other jobs, and routed to the appropriate output box in building 12A will normally be two hours or less during normal working hours.

9.5 OFF-HOURS JOB PROCESSING

To request overnight or weekend processing, include the proper ThruPut Manager statement on a Titan JOB statement.

To request overnight processing, add the following control statement:

```
//*+JBS BIND OVERNITE
```

To request weekend processing, add this control statement to the JCL stream:

```
//*+JBS BIND WEEKEND
```

9.6 JOB MANAGEMENT THROUGH THE WEB

You can submit batch jobs through the web on a one-time basis or on a regularly occurring schedule. Titan also provides a web facility for displaying or purging batch jobs. For more information on the various methods of submitting batch jobs and managing output, refer to the *Titan Batch Processing* manual.

Submitting a Single Job

There are two options for submitting a single batch job through the web:

- Execute the TSO SUBMIT command through the web at:

<http://titan.nih.gov/tsocmd>

- Use the Web Submit facility at:

<http://silk.nih.gov/submit>

When the web form appears, enter a mainframe data set name to be submitted as a batch job and specify the appropriate options.

The data set must have the record format FB (fixed-length records, blocked) with LRECL=80. **Note:** the data set can not be in WYLBUR edit format. The userid specified in the browser security window must have RACF authority of “read” or above for that data set.

When you submit the job, the job number is displayed. If the job is rejected for some reason, that information will also be displayed. To find why the job was rejected, either examine the printed output or fetch the job.

For further information on submitting batch jobs refer to the manual *Titan Batch Processing*.

Scheduling Recurring Work

Web-based Job Scheduler

The Titan Job Scheduler allows users to schedule recurring work to run automatically. This web-based facility gives you complete control over setting up, displaying, and modifying your batch job entries. You can schedule a job to be submitted once or on a continuing basis.

Simply provide the name of your JCL data set and when you want it run—that is, on a specific date, every day, every weekday, once a week, once a month, or the first or last workday of every month. After that, your job is run automatically on the date and time you requested with no further action on your part.

To use the Job Scheduler, go to:

<http://titan.nih.gov/job/scheduler>

Job Scheduler lets you see what jobs you have scheduled and allows you to change the JCL in your data sets at any time, without affecting the schedule. Each time a job is submitted through Job Scheduler, an entry appears in a log. To view the log, use the Display Submission Log button from the Job Scheduler web site.

Additional Scheduling Software

Users who require more complex scheduling (e.g., multiple jobs that interconnect in some way, or e-mail notification of job failure) may need NIH Data Center staff to help schedule recurring job streams with CA-7. CA-7 is a comprehensive automated production control system that can address the broad range of activities traditionally considered the responsibility of computer operation's production control team. As an online, real-time, interactive system, CA-7 automatically controls, schedules, and initiates jobs according to time-driven and/or event-driven activities.

In addition to CA-7, users can access a web-based application, Unicenter Enterprise Job Manager (UEJM), to simplify and automate the job scheduling, monitoring, and management functions. To use CA-7 and/or UEJM please contact the NIH Help Desk to request this option. See Section 5.2.1.

Displaying or Purging Batch Jobs

Use the web-based Display or Purge Jobs facility to locate your batch jobs and fetch the output or to purge batch jobs. Go to:

<https://titan.nih.gov/util/dispjq>

10 STORAGE AND BACKUP OF DATA

The NIH Data Center offers both disk and tape data storage. See Section 11.1 for the hardware specifications for storage devices. The NIH Data Center does not provide for archival storage of data. Data to be archived should be copied to tape and permanently removed from the NIH Data Center.

- Public disk storage, also known as DASD (direct access storage devices), is shared by all users for:
 - online storage of data sets (both long-term and short-term storage)
 - scratch space (for use during the processing of a batch job)

Backups of Titan disk data are sent off-site on a regular schedule. See Section 4.4 for information on disaster recovery.

- Magnetic tape facilities are also available—both for data storage at the NIH Data Center and for data exchange with other installations. The NIH Data Center has an automatic tape inventory system that ensures the privacy and integrity of data on tapes.

Data Set Names

On Titan, data set names (disk or tape) must begin with either:

- a userid (userid.dataname)
- or
- a Titan account (account.dataname)

Data set names that begin with an account (e.g., account.mydata) are ideal for production work. Because they do not belong to an individual, they do not need to be renamed if the userid is reassigned.

Additional Information for Data Set Names

- User-specified data set names cannot exceed 44 characters, including required characters, optional characters, and all periods.
- For each group of eight characters or fewer there must be a period, and the first character following each period must be alphabetic or national (@, #, or \$).
- The remaining characters can be alphabetic, numeric, national or hyphen.

RACF Profiles

Data set access, whether it is on tape or disk, depends on having the appropriate RACF profiles in place; see Section 4.6 for information. Any user who handles or stores personal data as defined by the Privacy Act of 1974 has legal responsibilities for maintaining its security and integrity. For further information, see Section 4.

10.1 PUBLIC DISK STORAGE

There are advantages to using direct access facilities (disk) instead of tapes:

- Several jobs can read the same data set at the same time. A tape can be used by only one job at a time.
- Jobs accessing the data will be less expensive because there will not be a charge to mount a tape. See Section 3.1 for specific details on costs.

The NIH Data Center operates in an all-cataloged disk storage environment. All data sets must be cataloged, and all references to data sets should be made through the catalog.

It is important to remember the following:

- All disk data sets must be cataloged.
- Neither UNIT nor VOLUME should be specified when referencing existing, properly cataloged data sets. Specify DISP=SHR and the data set name.
- If a data set cannot be cataloged (probably because another data set with the same name is already cataloged), the job will fail and the data set will not be created.

Space Management of Disk Data Sets

Titan uses IBM's SMS (System Managed Storage) and HSM (Hierarchical Storage Manager) as the primary storage management software for data set migration and backup. See Section 10.1.1.

10.1.1 SMS/HSM

Public disk volumes are under the control of the SMS/HSM environment. SMS simplifies data set allocation, provides efficient and flexible data set management, and facilitates the transition to new disk architectures. HSM, a part of SMS, manages data sets on groups of storage volumes and provides backup and recovery services.

SMS

For data stored on public volumes, SMS uses management classes to determine the following:

- how long to keep inactive data
- which data sets to back up
- how long to keep the backups after the data sets have been scratched
- when to stage a data set to secondary storage

When a data set is allocated—either initially or when recalled from secondary storage—SMS selects a volume with sufficient storage space and updates the catalog appropriately.

HSM

HSM places disk data on the most efficient media, based on size and usage history. HSM:

- keeps new and actively used data sets on a group of “primary” disk volumes, referred to as level 0
- moves less frequently accessed data sets onto HSM-owned “secondary” disk volumes (called level 1) and tapes (called level 2)
- tracks where each data set resides, moving (“migrating”) data sets off primary volumes as space is needed, and automatically “recalling” them as they are accessed

When a public data set is created, it is placed on one of the primary disks. As these disks start getting full, the least active data sets are moved to secondary volumes. When an interactive user or a batch job references a data set on secondary storage, HSM automatically brings the data set back to one of the primary volumes. While the data sets are on these secondary volumes, the catalog indicates that they are on a volume named MIGRAT. Under ISPF, the volume shown for data sets that have been migrated to compressed disk will be MIGRAT1; the volume shown for data sets that have been migrated to tape will be MIGRAT2.

When data is migrated to secondary storage and recalled, the data set is reallocated on primary storage, as follows:

- For sequential data sets with a secondary space allocation, HSM allocates only the amount of space actually occupied by the data, releasing any unused space and resetting the number of extensions used.
- For all other data sets, HSM allocates the total space previously allocated, whether occupied by data or not.
- Partitioned data sets are always condensed when recalled—moving all members to the beginning, and all unused space to the end of the data set.

There is no way to guarantee that a data set will remain on any particular disk volume or that two data sets (for example, a primary and backup) will always be on different volumes.

10.1.1.1 Incremental Backup and Recovery for Data Sets

For management classes that provide backup services (DISK2YR, DISK7YR, and LONGTERM), HSM creates daily incremental backups of online data. That is, each night a backup is made of any data set that has changed since the previous day. A data set is considered changed—even if the data set is not actually modified—whenever the data set is:

-
- renamed
 - opened for output
 - opened for input/output

HSM's incremental backup system:

- maintains up to five unique backup versions per data set name
- allows users to restore any data set that is lost or destroyed to its state as of the most recent backup
- keeps backups for six weeks after the data set has been deleted (or renamed)

All changed data sets are backed up with the following exceptions:

- data sets with no DSORG (empty) or partitioned (PO) data sets with zero block size
- data sets that cannot be read (damaged PDS directory, etc.)
- data sets that are allocated with a disposition of OLD at the time HSM is trying to back them up

Use ISMF (under ISPF, select C for Additional Products) to:

- display a list of incremental backups for a data set
- restore a data set from the available backups

See the *Titan Batch Processing* manual for more information on using ISMF. While these backups provide a great amount of protection for user data sets, it is not absolute. Critical data sets should be periodically saved by the user on tape and removed from the NIH Data Center premises. See Section 4.4 for information on disaster recovery.

10.1.1.2 Managing Older Migrated Data Sets

Web Retrieve is a data set management tool for older (pre-HSM) migrated data sets. It can only be used for data sets beginning with the userid format aaaaiii that were created or restored before April 18, 1994. Web Retrieve allows users to display, retrieve, rename, or delete data sets in the old migration system. To manage your older data sets, go to:

<http://silk.nih.gov/oldmigr>

Please note that the changes are performed through batch jobs and therefore may take several minutes to process.

10.1.1.3 Titan Management Classes

Figure 10-1 summarizes the unit names that correspond to the Titan SMS management classes (not including those specific to databases).

Figure 10-1. Characteristics of Management Classes

Titan Management Class/Unit Name	Backups	Length of Retention
TEMP	no	7 days
NOBACKUP	no	until deleted
DISK2YR	5	2 years after last use
DISK7YR	5	7 years after last use
LONGTERM	5	until deleted

These management classes determine which data sets are backed up and how long the data is kept.

In your JCL, you must specify either UNIT= or MGMTCLAS=. If you specify the unit name, it will be translated into one of the appropriate Titan management classes (shown above) to designate how the data will be stored.

Data Set Naming Conventions

Some data set naming conventions will assume specific management classes. That is, data sets that end with the following suffixes will assume the stated management class:

- Disk data sets whose names end with the final qualifier OUTLIST or SYSOUT are forced to be UNIT=TEMP.
- Disk data sets whose names end with the final qualifiers listed below are forced to be UNIT=LONGTERM (where * is a wildcard representing zero or more characters):

ASM	LOAD*
CLIST	OBJ
CNTL	PGM*
COB*	PLI
EXEC	PL1
FOR*	RESLIB
JCL	SCRIPT
LIB	SOURCE
*LIB	SRC
LLIB	TEXT

For example, a data set named `userid.MYSTUFF.LOAD` will be set to the `LONGTERM` management class. A data set named `userid.MYSTUFF.OUTLIST` will be set to the `TEMP` management class.

Data Sets Created through TSO

The default management class for data sets created through TSO is `DISK2YR`. This includes all data sets created in `WYLBUR`. To change the default, use one of the following methods:

- On the command line at the logon screen, include the `TSO UNITNAME` command.
- Include the `TSO UNITNAME` command in a `CLIST` that is executed from the command line at the logon screen.
- Use the `WYLBUR SET VOLUME` command in your `WYLBUR` session.
- Include `SET VOLUME` (e.g., `SET VOLUME LONGTERM`) in your `@WYLBUR.profile`.

Additional Information

The system will delete any rolled-off GDG (generation data group) unless the expiration date has not been reached (if one was specified). For more information, refer to the *Titan Batch Processing* manual.

10.1.2 Estimating Direct Access Space Requirements

When allocating disk data sets, it is important to determine the best block size for the data set and the right amount of space needed to store the data. Miscalculating the amount of space needed (via blocks, tracks, or cylinders) or specifying a block size that is too small or too large wastes disk space and increases storage costs. Specifying a block size that is too small can also increase the I/O charges for the job that reads or writes the data set.

The best way to allocate space is to allow the system to pick the optimum blocksize. Then, if the data set has to be moved to a new disk device with different track/cylinder architecture, it will be automatically reblocked to a new optimum block size.

When creating data sets through batch processing, use the `AVGREC` parameter if you know the approximate number of records you expect to put in a data set and the length of the records (or average record length for variable length records). The `AVGREC` parameter allows the operating system to automatically calculate both the optimum block size AND the space required for most physical sequential (PS) and partitioned (PO) data sets. Refer to the *Titan Batch Processing* manual.

10.2 TAPE STORAGE

Most Titan customer tape data resides in the Virtual Storage Manager (VSM)—a comprehensive tape storage system consisting of tape silos, disk buffers, new tape technology, and tape management software that improves performance and reduces human intervention in storing, retrieving, and mounting tapes. All VSM tapes are numbered above 500000.

Major features of the Titan tape storage system are as follows:

- The NIH tape library contains only 3490 cartridge tapes. There are some 3490 tapes available for purchase. To purchase a tape, go to:

<http://silk.nih.gov/purchase-tape>

- See Section 10.2.4 for information on foreign tape processing.
- Tape data set names must begin with a valid userid or RACF group (account).
- Titan tapes are owned and charged to the userid that begins the first data set name on the tape.

Note: to change the ownership of a tape you must copy the entire tape, changing the data set name of at least the 1st data set on the tape, so that it begins with the userid of the new owner.

- Tape data sets must have an expiration date/retention period.
- Tape data set security is controlled by RACF permissions on a data set rather than volume basis. For additional information, see Section 4.6.
- In order to access any data set on a tape, you must also have access to the first data set on the tape. (CIT strongly recommends that all data sets on a tape begin with the same userid.)
- CIT recommends (but does not require) that all Titan tape data sets be cataloged.

For More Information

Additional information concerning the use of tapes is available from the *Titan Batch Processing* manual.

Removal of Tapes

Tapes in the VSM cannot be removed from the NIH Data Center. Users can copy the data from VSM tapes to their own foreign tape or purchase a 3490 tape from CIT to be used as a foreign tape (see Section 10.2.5).

10.2.1 Tape Management System Features

Titan uses the CA-1 Tape Management System (TMS) software to maintain accountability of the tapes in the tape library. The system records the tape serial number and the data set name and characteristics in an internal catalog when the cartridge tape is created.

For Information on Your Tapes

- **ISPF Option L.5**—Manage your tapes in Titan's tape database through ISPF Option L.5. (From the CIT/Titan Primary Option Menu, select L for Local utilities/applications, and then select 5—TAPE.) This tape inventory facility provides immediate feedback about the status of your tapes and allows you to:
 - review tape information by either volume serial number or data set name
 - change expiration dates
(You can also use the TAPEEXP batch procedure to change the expiration date of the first data set on a tape; see below for more information.)
 - expire (scratch) a tape data set by setting the expiration date to the current date
 - expire the entire tape by setting the expiration date of the first data set on the tape to the current date
 - **Note:** Tapes don't actually become scratch until the morning of the next working day following their expiration dates. To scratch a tape immediately, use the TAPEEXP batch procedure described below.
- **ISPF Option 3.4**—You can view information on cataloged tape data sets by using option 3.4 of ISPF. When viewing a data set list, type TI next to the data set name to see the volume serial number, the size and format of the data set, plus the creation and last used information. This data is for display only—any updates must be done through the tape inventory panels (Option L.5).
- **TAPEEXP**—The TAPEEXP batch procedure changes the expiration date for the first data set on a tape. You must have RACF UPDATE access for the first data set. When the expiration date is reached, the tape is scratched. TAPEEXP also allows you to scratch a tape immediately. If the tape is part of a multi-volume data set, you can change only the expiration date of the first tape. When the expiration date is reached, all tapes in the set are scratched.

TAPEEXP executes the TMSUPDTE program from Computer Associates. For more information, refer to the *Titan Batch Processing* manual.

- **TAPEINFO**—The TAPEINFO batch procedure prints the status information that TMS has about a tape. The information printed includes the data set name, expiration date, creation date, creation time, name of the job that created the tape, name of the program that created the tape, date last used, record format, record length, and block size. The information is gathered in real time and is therefore valid as of the time you run the procedure. For more information, refer to the *Titan Batch Processing* manual.
- **VOLLIST**—The VOLLIST batch procedure finds all tapes owned by a particular userid, all tape data sets owned by a particular userid, or all tape data sets with a particular string in the data set name, even though they may be owned by various userids. For more information, refer to the *Titan Batch Processing* manual.

Recreating Tape Data Sets

When recreating a data set on a specific tape volume, the user must observe the following rules:

- For a tape with multiple data sets, **only the last data set can be recreated.**
- Recreation is not allowed if the data set has an expiration date of 99365.
- **The same data set name must be used.** Only when the data set name on the DD statement matches the data set name on the cartridge tape label will the expiration date be ignored. TMS will then allow the file to be overwritten.
- DISP=OLD must be specified. (DISP=NEW is used exclusively for requesting a scratch volume to create a new data set or adding a new data set to an existing tape volume).

If either of the last two conditions is not met in recreating a data set on a specific volume, a “scratch” volume will be used. The only indication that this has occurred is in the JES2 Job Log at the start of the job output.

10.2.2 TMS Error Conditions

TMS ABENDs result in a system completion code of the form *x*EC, where *x* can be a number or a letter. Refer to *Titan Batch Processing* for more information on TMS completion codes and messages.

One abnormal situation occurs if a scratch tape is requested for output and TMS does not accept the mounted tape as a scratch tape. TMS issues an “IECTMS3... volser IS NOT SCRTCH (errorcode)” message with an accompanying error code and requests another tape. If the situation resulted from improperly coded DD statements, the job will be terminated.

10.2.3 Tape Security

Tape security on Titan is controlled by RACF permissions on a data set rather than volume basis. Data set protection depends on the RACF profiles in place and applies to any data set, regardless of whether it is on tape or disk. Users may need to modify their RACF profiles to provide the correct level of access to tape data. In order to have access to data sets on a tape, the user must have the proper access to the first data set on the tape. For RACF processing on the web, go to:

<http://titan.nih.gov>

and select RACF.

10.2.4 Foreign Tapes

Foreign (or non-NIH) tapes are those that are supplied by users and are not under the control of the CA-1 Tape Management System. Foreign tapes can be used to exchange data with

other installations. Any foreign tape that conforms to Titan's normal tape standards may be used.

The TAPEMAP utility program displays the format of the volume, header, and trailer labels of a standard-labeled or unlabeled tape for one or more data sets on a foreign tape. For more information on TAPEMAP, refer to the *Titan Batch Processing* manual.

Check-in Check-out Process

There is a check-in and a checkout process for tracking foreign tapes. Foreign tapes can be checked in for up to a week, to be returned to output boxes the Monday following check-in. All foreign tape processing is done at the NIH Data Center's Bethesda campus. For information on input/output distribution services, see Section 5.6.

10.2.5 Purchasing Tapes

To purchase a tape from the NIH Data Center to be used as a foreign tape, use the Purchase Tape facility at:

<http://silk.nih.gov/purchase-tape>

11 HARDWARE FACILITIES

This section describes the equipment at the central facility for Titan and information concerning other hardware devices used to access the central complex.

11.1 TITAN CONFIGURATION

Titan, the mainframe component of the NIH Data Center, is an integrated computing facility composed of multiple logical processors interconnected by over 900 volumes of shared direct access storage and common operating system software. The processors support 64-bit addressing and real memory. Titan uses an IBM z9-BC (Business Class) zSeries server known for reliability, availability, serviceability, scalability, virtualization, security and lower power consumption.

The system has a complement of peripheral devices that includes tape drives and electrographic printing subsystems. Most of the peripheral devices can be shared among logical processors or switched to one or more of the logical processors. Many devices are also accessed through multiple data channels within a logical processor. These capabilities allow for the minimal disruption of service in the event of a subsystem or component failure.

A summary of the major hardware components for Titan follows; additional information may be obtained from the *IBM ESA/390 Principles of Operation*, SA22-7201 and in the various component description manuals. Refer to the hardware and software information at the back of each issue of *Interface* for the current serial numbers of the logical processors.

Hardware devices for Titan include the following:

Model	Item Description
IBM z9 BC model 2096-M03	central processing unit
Sun 9990V	disk storage subsystem
3490E	cartridge tape drives (36 track, 38,000 bpi)
STK 9310 (Powderhorn)	automated tape libraries (silos)
Sun/STK SL8500	modular tape library system
STK VSM	virtual storage manager (virtual tapes)
STK 9840	ultra high performance magnetic tape drives
3900	laser printing subsystems
2105ES	cut-sheet laser printers
4245	impact printers
3366 OSA-Express2 1000Base-T	network interface cards
0863 Crypto Express2	cryptographic co-processor cards

11.1.1 External Device and Channel Specifications

The central processors may have a great variety of external devices attached, including tape drives, disk drives, printers, and terminals. Data going between the processor complex and the external device passes through a logical path called a channel. Channels are the direct controllers of all input/output devices. They provide the capability of reading or writing data at the same time that actual computing is taking place by relieving the processor complex of the task of communicating directly with the device.

11.1.1.1 Direct Access Device Specifications

Sun 9990V Disk Storage Subsystem (logical 3390)

Mod-3 3390 volumes used for Private User data:

- 50,085 tracks/logical volume
- 15 tracks/cylinder
- 3,339 cylinders/logical volume
- 2.838 gigabytes/logical volume

Mod-9 3390 volumes used for SMS managed Public volumes, with a volume serial beginning with DS:

- 150,255 tracks/logical volume
- 15 tracks/cylinder
- 10,017 cylinders/logical volume
- 8.514 gigabytes/logical volume

11.1.1.2 Magnetic Tape Device Specifications

3490E Magnetic Tape Subsystem

- cartridge tape and enhanced capacity cartridge tape
- 36 track recording format
- 76,000 bytes/inch data density
- high-speed search
- 4.5 MB per second data transfer rate
- resident error-recovery procedures
- Improved Data Recording Capability (IDRC) feature

9840 Magnetic Tape Drives

- cartridge tape system - dual-reel inside the cartridge; tape is always enclosed
- tape load point - at the middle of the tape for faster loading and searching
- cartridge external physical form factor - same as 3490E cartridges
- 20GB uncompressed cartridge capacity - up to 80GB for highly compressed data
- tape speed - read/write 79 inches per second (IPS); rewind - 315 IPS
- up to 20MB/second data rate for compressed data
- ESCON channel connected to IBM mainframe system

-
- mostly located within StorageTek Automated Tape Libraries
 - separate control unit for each tape drive

VSM Virtual Storage Manager

- emulates 3490E tape drives
- storage provided by a RAID-6+ DASD configuration

11.1.1.3 Output Device Specifications

3900 Wide Advanced Function Continuous Form Printer

- all-points addressable printing
- 229 pages/minute
- multiple fonts
- graphics capability
- variable spacing
- standard paper size of 11" x 8 1/2" (without easy-strip margins)

2105ES Cut-sheet Laser Printer

- all-points addressable printing
- landscape (11 x 8 1/2 inch) or portrait (8 1/2 x 11 inch) mode on cut-sheet forms with a 3-hole punch option
- up to 105 ipm (images per minute) with up to 8,050 sheet input capacity
- 1200 x 1200 dpi (dots per inch) resolution
- easy-to-use GUI and in-line finishing

4245 Impact Printer

- 132 characters/line
- 2000 lines/minute (max) depending on print train use
- 6 or 8 lines/inch vertical spacing
- SN10 character set
- continuous forms

12 INDEX

- /*BOX, 83
- /*CNTL, 102
- /*DISCOUNT, 45
- /*JOBPARM, 83, 136
- /*NETACCT, 136
- 3270 connections
 - IMS, 116
 - Macintosh, 92
 - QWS3270 Secure, 91
- 3270 file transfer
 - IND\$FILE, 96
 - WS_FTP Pro, 94
- ABENDs
 - TMS, 151
- Absolute Track Allocation, 102
- access, 91
 - persons with disabilities, 25
- account officials, 27
 - assignments, 28
- account sponsors
 - billing, 45
 - interest group, 28, 81
 - locator, 19
 - registering users, 28
 - responsibilities, 30
 - Web Sponsor, 30
- accounts, 32, 38
 - closing, 41
 - forms, 34
 - Titan, 38
 - Web Sponsor, 35
- Active Directory, 19
- ADB. *See* Administrative Database
- ADDS, 103
- Administrative Database, 116
- ADSERASE, 68
- all-cataloged environment, 144
- ALTDSD, 103
- Americans with Disabilities Act, 25
- AMS commands, 103
- APF Facilities, 102
- AppleTalk, 98, 136
- application hosting
 - co-location services, 4
 - full-service, 5
- application selection menu, 91
- application software, 101
- AR. *See* Remedy
- archival storage, 143
- ASIG, 28, 81
- Assembler Language, 119
- assistance, 69
 - consulting, 72
 - database, 75
 - documentation, 78
 - implementing non-NIH software, 75
 - telecommunications, 74
 - telephone, 72
 - training, 77
 - users groups, 81
- backups, 143, 145, *See also* disks
- badges, 19, 51
- BASE SAS, 129
- batch jobs, 139
 - charging, 43
 - display or purge, 142
 - documentation, 139
 - JCL, 140
 - job classes, 140
 - Job Scheduler, 142
 - messages, 81
 - off-hour processing, 140
 - running, 139
 - saving costs, 48
 - submission via FTP, 93
 - turnaround, 140
 - web submission, 122, 141
 - Web Submit, 141
- billing, 45
- billing coordinators, 45, 46, 47
- Biomedical Research Mac Users Group.
See BRMUG

Biowulf Cluster, 7
 BMDP, 130, 131
 BookManager, 80, 134
 box. *See* output boxes
 BRMUG, 81
 broadcast messages, 81
 bus service, 17
 C/C++, 120
 CA-7, 142
 cataloged procedures, 139
 Center for Information Technology. *See*
 CIT
 Central Email Service, 6, 132
 central processing unit, 153
 CES. *See* Central Email Service
 change management, 5, 50
 charging, 43
 batch processing, 43
 controlling costs, 48
 cost recovery basis, 4
 DB2, 43
 disaster recovery, 44
 discount processing, 45
 disk storage, 44
 IMS, 44
 interactive processing, 43
 printing, 44
 printing from network, 44
 SILK, 44
 tape storage, 44
 Checkpoint/Restart, 102
 CICS, 114
 CIT, 2
 Computer Training Program. *See*
 training
 users groups, 81
 CIT Hot News, 76, 81
 CIT Knowledge Base, 76
 CIT maintenance calendar, 77
 CIT Service Request. *See* IT Service
 Request
 classes
 management classes, 147
 classroom training, 77
 COBOL, 118
 co-location services, 4
 communications
 assistance, 74
 between users and the data center, 80
 computer output, 82
 computer services telephone directory, 18
 Connect:Direct, 93, 96
 registration, 97
 Connect:Direct Secure+, 97
 connectivity, 85
 Connect:Direct, 93, 96
 file transfer, 92
 FTP, 93
 IND\$FILE, 96
 interactive access, 90
 Macintosh, 92, 95
 Network Job Entry, 99
 Parachute, 87
 QWS3270 Secure, 91
 remote access, 87, 88
 SSL/TLS, 91, 93, 94
 telnet, 90
 Titan, 85
 VPN, 88
 WS_FTP Pro, 94
 consulting, 72
 database, 75
 NIH Help Desk, 72
 NIHnet, 72
 contracting guidelines, 24
 copying software
 restrictions, 24
 courses, 77
 cross-system enqueue, 102
 Customer Locator, 19, 121
 customer support, 69
 web-based, 76
 customized SILK server, 123, 126
 data center. *See* NIH Data Center
 data exchange, 92
 data set integrity, 102
 data sets. *See* disk data sets
 database, 114
 assistance, 75
 DB2, 90, 117
 IMS, 116
 Microsoft SQL Server, 117

Model 204, 115
 Oracle, 117, 118
 relational, 117
 database technologies
 SILK, 122
 DB2, 90, 117, 122
 charging, 43
 DB2 EZStart
 SILK, 122
 DCS. *See* Division of Customer Support
 debugging
 help, 72
 DECA. *See* Division of Enterprise and
 Custom Applications
 deregistration, 40
 deregistration officials, 35, 38, 40
 device dependence warning, 75
 dialup access
 FTS access, 17
 NIHnet, 87
 Parachute, 87
 personal computers, 87
 direct access storage
 devices, 144, 154
 directions to data center, 17
 directories, 19
 disaster recovery, 53
 disaster recovery program, 5, 7, 53
 discount processing, 45
 discrete profiles, 60, 61, 62
 disk data sets
 /*CNTL to avoid contention, 102
 charging, 44
 data storage, 143
 estimating space requirements, 148
 names, 143
 older, 146
 restoring lost, 145
 retrieve, 146
 scratched, 68
 SILK servers, 124, 127
 Disk Space Allocation/Cost Procedure,
 122
 disks
 backup service, 145
 characteristics, 154
 hardware specifications, 154
 public online, 144
 Display or Purge Jobs, 121
 Division of Computational Bioscience, 9
 Division of Computer System Services, 3
 Division of Customer Support, 11
 Division of Enterprise and Custom
 Applications, 6, 9
 Division of Network Systems and
 Telecommunications, 10
 DNS. *See* domain name servers
 DNST. *See* Division of Network Systems
 and Telecommunications
 DO. *See* deregistration officials
 documentation. *See* publications
 domain name servers, 89
 Easymail, 122, 132
 education
 Computer Training Program, 77
 electronic mail
 Central Email Service, 132
 communications, 80
 data center messages, 80
 Easymail, 132
 Formsmail, 133
 sending information from a web form,
 133
 SENDMAIL, 133
 Titan system, 132
 e-mail. *See* electronic mail
 encryption
 SILK servers, 126
 SSH file transfer, 95
 SSL/TLS file transfer, 93, 94
 enterprise systems
 EOS, 3
 operating systems, 101
 Titan, 3
 Windows Server Services, 3
 environmental controls, 51
 EOS, 5, 104, *See also* Unix
 Oracle databases, 118
 exchanging data
 with other data centers, 92
 external devices, 154
 FAQs (NIH Help Desk), 76

FDCC, 92, 94
Federal Desktop Core Configuration. *See*
FDCC, *See* FDCC
Federal Information Security Management
Act, 49
Fetch, 95
FETCH procedure, 135
figures
 account officials assignments, 28
 charging, 43
 management classes, 147
 map of Fernwood building, 16
 map of the Building 12 complex, 15
 map of the NIH campus, 12
 map of the Washington area, 14
 NIH Data Center services directory, 18
 online service directory, 90
 operating hours, 21
 Parachute, 88
 RACF generic profiles, 63, 64
 RACF typical tasks, 65
 references for new applications, 24
 SILK-based services, 121
 supported software products, 70
 Titan identifications, 33
file information systems, 133
file transfer, 92
 Connect:Direct, 93, 96
 Connect:Direct Secure +, 97
 FTP, 93
 host-to-host transfer, 99
 IND\$FILE, 96
 Macintosh, 95
 Network Job Entry, 99
 other data centers, 92
 SSH, 93, 95
 SSL/TLS, 93, 94, 95
 tapes, 97
 TCP/IP, 93
 web-based, 95
 WS_FTP Pro, 94
File Transfer Protocol. *See* FTP
fire containment, 51
firewall services, 5
FISMA. *See* Federal Information Security
Management Act
foreign tapes, 151
 TAPEMAP, 152
forms
 account authorization, 34
 Account Request for NIH Customers,
 34
 Account Request for Non-NIH
 Customers, 35
 Deregistration Official Authorization,
 35
 non-NIH renewal, 35
Formsmail, 122, 133
FORTRAN, 119
Frequently Asked Questions, 76
FTP, 85, 93
 batch job submission, 93
 Macintosh, 95
 WS_FTP Pro, 94
FTS access, 17
full-screen access
 IMS, 116
 Macintosh, 92
 QWS3270 Secure, 91
 TN3270, 90
full-service hosting, 5
games
 policy, 103
 prohibited, 22
GDG, 148
generation data group. *See* GDG
generic profiles, 60, 61
 figures, 63
 naming conventions, 62
Google, 7
hardware, 153
 channel specifications, 154
 disk drive specifications, 154
 external devices, 154
 printers, 155
 processor specifications, 153
 system configuration, 153
Helix Systems, 7
 web, 9
help, 69
Help Desk. *See* NIH Help Desk
HHS consolidated data center, 3

HHS Directory, 20
 Hierarchical Storage Manager. *See* HSM
 hosted Unix, 3, 5
 host-to-host file transfer, 99
 Hot News (CIT), 76, 81
 hot site, 53
 HRIBS, 121
 HSM, 144, 145
 backup and storage, 145
 incremental backup, 145
 Human Resources Information and Benefit System. *See* HRIBS
 identification badges, 51
 iForgotMyPW, 56
 IMS, 116, 122
 3270 access, 116
 charging, 44
 publications, 117
 QWS3270 Secure, 92
 registration restrictions, 116
 restricted access, 117
 IMSL, 130
 incremental backup, 145
 IND\$FILE, 96
 independent training, 78
 Information Management System. *See* IMS
 integrity of data sets, 102
 interactive access, 90
 TSO, 90
 Interactive Output Facility. *See* IOF
 interactive processing
 charging, 43
 interactive systems, 91
 interagency agreement, 35, 46
Interface, 1
 Internet. *See* also NIHnet
 NIHnet access, 93
 web, 86
 introduction, 1
 invoices, 45
 IOF, 131
 IRS, 133
 ISMF, 146
 ISPF, 110
 BookManager, 80
 documentation, 111
 editing, 111
 ISMF, 146
 logon, logoff, 111
 MAX, 111
 MVS/QuickRef, 112
 UDF, 112
 IT Service Request, 69, 72
 canceling, 74
 providing documentation, 74
 refunds, 74
 submission, 73
 tracking, 74
 JCL, 139, 140
 JES2 functions, 101
 job class summary, 140
 job control language. *See* JCL
 Job Scheduler, 121, 142
 job turnaround
 output turnaround, 140
 KB. *See* CIT Knowledge Base
 Kiwi Wiki service, 7
 KMIG, 81
 Knowledge Management Interest Group, 81
 LANs
 NIHnet, 85
 large-volume output, 83
 leak detectors, 51
 Linux, 7, 104
 Listserv, 80
 Locator
 SILK Web, 19
 logging on to TSO, 105
 Macintosh
 FTP, 95
 printing, 98
 TCPIP connectivity, 92
 TN3270, 92
 TN3270X, 92
 mainframe access, 85
 management classes, 147
 figure, 147
 maps
 building 12 complex, 15
 Fernwood building access, 16

NIH campus, 12
Washington area, 14
maps and directions, 11
Mark IV. *See* VISION:Builder
MAX, 110, 111
message facilities, 81
 electronic mail, 80
 to and from users, 80
Metrorail stop, 17
Microsoft SQL Server, 117
MIM. *See* Multi-Image Manager
Model 204, 115
 logon, 115
 security, 115
 web access, 115, 122
modem access, 87
Molecular Modeling Interest Group, 81
Multi-Image Manager, 102
MVS. *See* z/OS
MVS Password Protection, 102
MVS/QuickRef, 110, 112
name server, 89
 Internet address translation, 89
NED, 19
 Active Directory, 19
network connections
 charging, 43
Network Job Entry, 99
 printing on Titan, 99, 136
networks
 access, 85, 90
 name servers, 89
 NIHnet, 85
 printing services, 98, 136
 services, 85
NexTalk system, 25
NIH Connectivity Tools, 121
NIH Data Center, 1
 system configuration, 153
NIH Data Center services telephone
 directory, 18
NIH Data Warehouse. *See* nVision Data
 Warehouse
NIH Enterprise Directory. *See* NED
NIH Help Desk, 1, 69, 72
 canceling a service request, 74
CIT accounts, 31
CIT Hot News, 76
CIT maintenance calendar, 77
FAQs, 76
 operating hours, 20
 service requests, 73
 tracking a service request, 74
 virus alerts, 77
NIH Login
 assistance, 19
 Customer Locator, 19
 forgotten passwords, 56
 Parachute, 87
 password requirements, 56
 Password Reset, 29, 67
 reset Helix passwords, 37
 reset Titan passwords, 56
 VPN, 88
 Web Sponsor, 39
NIH passwords, 56
NIH WYLBUR, 112
NIHnet, 85
 access to interactive systems, 90
 access to the Internet, 93
 Central Email Service, 132
 communications assistance, 74
 connectivity, 85
 consulting, 72
 dialup access, 87
 Division of Network Systems and
 Telecommunications, 10
 Domain Name Service, 89
 infrastructure, 85
 interactive access, 90
 IP number, 89
 Parachute, 87
 printing services, 98, 136
 PrintShare, 136
 remote access, 85, 87, 88
 security, 50, 85
 services, 85
 VPN, 88
 VPS, 136
NJE. *See* Network Job Entry
non-NIH software, 75
NTS. *See* NexTalk system

- nVision Data Warehouse, 46
- off-hours job processing, 140
- offline listing
 - Web Listoff, 136
- online access, 89
- online directories, 19
- online publications, 134
- online service directory, 90
- online services
 - interactive access, 90
- online storage, 143
- online training, 78
- online training information, 77
- operating hours, 20
- operating system, 139
 - functions, 101
 - Linux, 104
 - overview, 101, 139
 - Unix, 104
 - UNIX System Services, 104
 - z/OS, 101
- operating hours
 - figure, 21
- Oracle, 117, 122
 - Oracle client, 118
- orientation, 1
- output
 - delivery, 136
 - facilities overview, 135
 - mailed, 83
 - misdirected, 84
 - printing services, 135
 - special handling, 83
 - turnaround, 140
- output boxes, 29, 52, 82, 136
- OUTPUT HOLD
 - examining output, 140
 - jobs purged, 135
 - unattended service, 22
- overnight processing, 140
- Parachute
 - apply, 87
 - dialup access, 87
 - figure, 88
 - telecommunications assistance, 74
- parking, 17
- Parklawn, 82, 136
- Password Reset, 29, 37, 56, 67, 121
- passwords, 55, 57
 - changing, 67
 - forgotten, 56
 - forgotten NIH passwords, 56
 - NIH Login, 56
 - non-expiring, 33
 - RACF, 55
 - reset, 29, 56
- personal computers
 - host communications, 74
 - remote access, 87
- phone numbers, 18
- PL/I, 119
- printing
 - 3900 printers, 155
 - charging, 44
 - computer output, 82
 - cut-sheet laser printer, 155
 - distribution, 136
 - impact printer, 155
 - local networked printers, 136
 - network, 136
 - charging, 44
 - Network Job Entry, 99, 136
 - NIHnet, 98
 - output, 52
 - output delivery, 136
 - OUTPUT HOLD, 135
 - printer specifications, 155
 - services, 135
 - VPS, 98
 - Web Listoff, 136
- PrintShare, 98, 136
 - VPS, 98
- private output, 83
- processor specifications, 153
- programming languages, 118
 - Assembler Language, 119
 - C/C++, 120
 - COBOL, 118
 - FORTRAN, 119
 - PL/I, 119
 - REXX, 120
- proper use, 22

references, 23
 PROTECT function, 61
 protecting data sets, 61
 public direct access storage, 144
 public SILK server, 123
 publications, 78
 IBM, 80
 IBM BookManager, 134
 interest list, 79
 online, 80, 134
 ordering, 78
 ordering limits, 79
 Purchase Tape
 web, 122, 152
 purge jobs, 142
 QuickRef. *See* MVS/QuickRef
 QWS3270 Secure, 91
 IMS, 92
 RACF, 55, 64
 changing passwords, 67
 converting discrete to generic profiles,
 61
 data set names, 61
 definitions, 58
 discrete profiles, 60, 61, 62
 ERASE function prohibited, 68
 generic profiles, 60, 61, 63
 passwords, 55
 PERMIT, 67
 profiles, 61, 143
 PROTECT, 61
 RACF coordinators. *See* security
 coordinators
 RACFid, 32, 58
 tapes, 52, 68, 151
 typical tasks, 65
 Web RACF, 64, 67
 rates. *See* charging
 RCVFILE, 93
 Redhat Linux, 7
 references for new applications
 figure, 24
 refunds, 47
 conditions for granting, 47
 requests, 47
 submitting a IT Service Request, 74
 registration, 27, 28
 forms, 34
 other CIT services, 34
 Remedy, 74
 remote access, 87, 88
 Parachute, 87
 special Titan userids, 33
 VPN, 88
 renewal form, 35
 Reserve/Release Macros, 102
 restrictions, 102
 copying software, 24
 illegal computer use, 22
 IMS, 116
 no games, 103
 no unmovable data sets, 102
 non-NIH software, 75
 Restructured EXtended eXecutor. *See*
 REXX
 REXX, 120
 running batch jobs, 139
 SAS, 129, 130
 SAS 70 audits, 3, 50
 SAS/ACCESS
 DB2 interface, 129
 Oracle interface, 129
 SAS/AF, 129
 SAS/CONNECT, 129
 SAS/ETS, 129
 SAS/FSP, 129
 SAS/GRAPH, 129
 SAS/OR, 129
 SAS/QC, 130
 SAS/SHARE, 130
 SAS/STAT, 130
 schedule of operation, 20
 scheduling batch jobs
 CA-7, 142
 Job Scheduler, 142
 Unicenter Enterprise Job Manager, 142
 scientific computing, 7
 scientific statistical systems, 129
 scratched data sets, 68
 search engine, 7
 Section 508, 25
 secure file transfer, 95, 122

Secure Shell. *See* SSH

secure SILK server, 124

Secure Sockets Layer. *See* SSL/TLS

security, 49

- badges, 51
- campus access, 11
- coordinators, 38, 54, 55
- data, 51
- disaster recovery, 53
- disk data sets, 145
- facilities, 51
- input/output controls, 52
- Parachute, 87, 89
- passwords, 55, 57
- physical, 51
- RACF, 55
- restricted areas, 51
- tapes, 52, 68, 151
- violations, 52

security coordinators, 38, 54, 55

seminars, 77

SENDFILE, 93

SENDMAIL, 133

Service Level Description, 2

Service Request. *See* IT Service Request

SGI Origin system, 7

Shadow Web Server, 120

SharePoint, 6

SILK, 86, 120

- charging, 44
- Customer Locator, 19, 121
- customized servers, 123, 126
 - linking data sets, 127
- data set naming, 124
- database technologies, 122
- DB2 EZStart, 122
- Disk Space Allocation/Cost Procedure, 122
- Display or Purge Jobs, 122
- Easymail, 122, 132
- Formsmail, 122, 133
- graphics files, 125
- HRIBS, 121
- Job Scheduler, 121, 142
- Managed Migrated Data Sets, 122
- Model 204 access, 115

NIH Connectivity Tools, 121

Password Reset, 56, 121

public server, 123

Purchase Tape, 122, 152

RACF, 64, 122

registering users, 38

Secure File Transfer, 95

secure server, 124

server options, 123

services, 121

SSL/TLS option, 126

TSO commands, 109, 122

TSO SUBMIT, 141

user applications, 129

View or Download Private Data Sets, 122, 129

View or Download Public Data Sets, 122, 128

VPS printing, 98, 122

Web Listoff, 122, 136

Web Retrieve, 146

Web Sponsor, 30, 38, 121

- NIH Login, 121

Web Submit, 122, 141

simulations systems, 131

- IOF, 131

SMS, 144

software

- acquiring new, 75
- copying restrictions, 24
- FDCC restrictions, 92, 94
- license restrictions, 24
- network access, 85
- non-NIH, 75
- not permitted, 102
- overview, 101
- products, 70, 101
- standards, 75
- support, 69
- transferring disk data, 76
- unauthorized use, 24

space allocation

- system determined, 148

space requirements, 148

Special SMF Exits, 102

Special SVCs, 102

SPSS, 130, 131
 SQL Server, 122
 SSH, 93, 95
 SSL/TLS, 93, 126

- Connect:Direct Secure+, 97
- mainframe-to-mainframe, 94
- QWS3270 Secure, 91
- SILK servers, 126
 - charging, 44
 - web-based file transfer, 95
- WS_FTP Pro, 94

 SSL/TLS, 91
 standards. *See* software

- contracts, 24
- software, 75

 statistical software, 11, 129, 130

- SAS, 130
- SAS under TSO, 130

 storage, 144

- SMS/HSM, 144

 storage of data, 143
 SUPER ZAP, 103
 support

- software, 69
- users, 69

 system broadcast messages, 81
 system configuration, 153
 System Managed Storage. *See* SMS
 system software, 101
 Tape Management System. *See* TMS
 TAPEEXP, 150
 TAPEINFO, 150
 TAPEMAP, 152
 tapes, 149

- charging, 44
- check-in, check-out, 152
- data set names, 143
- data sets
 - recreating, 151
- exchanging with other installations, 97
- foreign, 52, 151
- inventory management, 150
- ownership change, 149
- purchasing, 52, 122, 152
- RACF, 68
- removal, 149
- reports, 150
- security, 52, 151
- storage, 143
- TAPEEXP, 150
- TAPEINFO, 150
- TAPEMAP, 152
- TMS error conditions, 151
- TMS/CA-1, 149
- VOLLIST, 150

 TCP/IP, 85, 90

- client products, 90
- file transfer, 93
- interactive access to Titan, 90
- Windows, 90

 TDD, 25
 telecommunications, 10

- assistance, 74

 telephone directories

- Customer Locator, 19
- HHS, 20
- NED, 19
- NIH Data Center services, 18
- online, 19

 telephone numbers, 17
 telnet access, 90
 ThruPut Manager, 102, 140
 Titan access, 85
 Titan application hosting, 3
 Titan Customer Locator, 121
 Titan identifications

- figure, 33

Titan News, 1, 80
 TLS. *See* SSL
 TMS, 149

- ABENDs, 151
- error conditions, 151

 TN3270, 90

- full-screen access, 90
- Macintosh, 92
- QWS3270 Secure, 91

 TN3270X

- Macintosh, 92

 training

- accessibility, 77
- classroom courses, 77
- courses, 77

- independent training, 78
- location, 77
- online information, 77
- registration, 77
- Transport Layer Security. *See* TLS
- transportation
 - bus, 17
 - subway, 17
- TSO, 104
 - automatic logoff, 109
 - canceling a session, 109
 - commands via web, 122
 - IND\$FILE, 96
 - ISPF, 110
 - logging off, 108
 - logon, 105
 - logon screen, 105
 - MAX, 111
 - MVS/QuickRef, 112
 - network access, 90
 - NIH WYLBUR, 112
 - PF key values, 105
 - RACF commands, 66
 - SAS, 130
 - session warnings, 104
 - submit jobs via web, 141
 - UDF, 112
 - utilities, 108
 - web access, 109
- UDF, 110, 112
- unattended service, 22
- Unicenter Enterprise Job Manager, 142
- uninterruptible power supply, 52
- Unix
 - EOS, 5, 104
 - Helix Systems, 7
 - UNIX System Services, 104
- Unix workstations
 - file transfer, 93
- UPS. *See* uninterruptible power supply
- User Display Facility. *See* UDF
- user groups
 - CIT, 81
- user support, 69
- userids, 32
 - canceling, 41
 - non-expiring passwords, 33
 - remote access only, 33
 - restrictions on use, 22
- utilities, 139
- video services, 10
- View or Download Private Data Sets, 129
 - web, 122
- View or Download Public Data Sets, 128
 - web, 122
- Virtual Server service, 6
- Virtual Storage Manager. *See* VSM
- VISION:Builder, 133
- VOLLIST, 150
- VPN, 88
 - apply, 88
- VPS, 98, 136
 - SILK, 122
- VSM, 149
- VTAM Printer Support system. *See* VPS
- warnings
 - TSO sessions, 104
- web, 86
 - Helix Systems, 9
 - Job Scheduler, 142
 - Model 204 access, 115
 - RACF, 64
 - See also* SILK, 86
 - SILK, 120
 - SQL Processor for DB2
 - SILK, 122
 - submitting batch jobs, 141
 - TSO SUBMIT, 141
- Web Listoff, 122, 136
- Web RACF, 64, 67, 122
 - typical tasks, 65
- Web Retrieve, 122, 146
- web service directory, 86
- Web Sponsor, 29, 35, 38, 121
 - functions, 36
 - NIH Login access, 39, 121
 - terminating services, 41
 - Titan userid access, 38
- Web Submit, 122, 141
- weekend processing, 140
- Wiki service, 7
- Windows Server Services, 1, 3, 6

Virtual Server Service, 6
wireless services, 10
World Wide Web. *See* web
WS_FTP Pro, 94

WTO/WTOR Macros, 102
WYLBUR
 NIH WYLBUR, 112
z/OS operating system, 101

Titan User's Guide

Document Evaluation

Is the Manual:

	YES	NO
Clear?	<input type="checkbox"/>	<input type="checkbox"/>
Well organized?	<input type="checkbox"/>	<input type="checkbox"/>
Complete?	<input type="checkbox"/>	<input type="checkbox"/>
Accurate?	<input type="checkbox"/>	<input type="checkbox"/>
Suitable for the beginner?	<input type="checkbox"/>	<input type="checkbox"/>
Suitable for the advanced user?	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

Please give page references where appropriate. If you wish a reply, include your name and mailing address.

Send to: National Institutes of Health
Center for Information Technology
NIH Data Center
Building 12A, Room 4021
12 South Drive MSC 5607
Bethesda, MD 20892-5607

FAX to: (301) 496-6905

IC or Agency:
Date Submitted:
Name (Optional):
E-mail Address:

