Network Access to Titan

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1 INTRODUCTION

This manual describes network access to Titan, the mainframe system at the NIH Data Center, which is managed by the Center for Information Technology (CIT). This documentation assumes that the user's workstation is connected to the NIHnet through a LAN (local area network) or some form of remote access. For further information on remote access technologies, including Parachute and VPN (virtual private network), go to:

https://remoteaccess.nih.gov

For more information on CIT, including links to other services, go to:

http://cit.nih.gov

This manual does not replace the documentation that accompanies a user's TCP/IP software, but rather serves as a supplement to that documentation.

CIT also supports batch programs to carry out host-to-host file transfer between data centers. These include SENDFILE/RCVFILE and Connect:Direct. Refer to the *Titan Batch Processing* manual for information about using these applications.

1.1 ASSISTANCE

CIT offers several types of assistance for Titan users:

- Online Help
  - Visit the IT Help Desk on the Web at:

    http://ithelpdesk.nih.gov/

  - Request assistance through a Web-based CIT Service Request at:

    http://ithelpdesk.nih.gov/support

- Telephone the NIH Help Desk

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

Documentation

All registered users can order, print, and view manuals relating to Titan, such as the *Titan User's Guide, Titan Batch Processing*, and *Interface* through the Web. Go to:

http://publications.cit.nih.gov

Contact the NIH Help Desk if you require assistance ordering manuals.

CIT Computer Training Program
The CIT Computer Training Program offers a wide variety of courses that enable users to make efficient and effective use of computing, networking, and information systems in their work at NIH. For more information go to:

http://training.cit.nih.gov

Other Online Resources
Between updates to this manual, you can receive information concerning changes that will affect Titan 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 view an issue, go to:

  http://datacenter.cit.nih.gov/interface

- CIT Web pages at:

  http://cit.nih.gov

1.2 THE FORMAT OF THIS MANUAL

Examples in this manual are shown using these styles:

This is an example of text the computer will display on screen.

This is an example of text you are expected to type.

Additionally, words surrounded by "<" and ">" should be entered using a specific value. For example, if the word <date> appears in an example you should type a date such as "05/17/07" not the word "date".

1.3 GENERAL TERMS

Host defines any computer connected to a network. **Client**, as used in this manual, refers to the software running on your local machine. The **server** is the software running on the mainframe (Titan). Your client will ask our server to perform certain tasks at the necessary time. The machines communicate using a protocol, which dictates what form the data between them takes. This occurs automatically, without any intervention by you.

Refer to the glossary in Appendix C for explanations of other terms related to network connections to Titan and file transfer.

This manual describes how to initiate certain connections to Titan. Connections to other facilities are beyond the scope of this document.

2 GETTING STARTED

This section will provide you with a few pointers on the hardware and software required to gain network access.

2.1 TCP/IP CLIENT SOFTWARE

In order to access Titan TCP/IP services from a workstation with access to NIHnet (whether via a LAN connection, dialup connection or broadband connection such as DSL or cable modem), it is necessary to install a compatible communications software package on the workstation itself. High-speed file transfer, remote job submission, and 3270 (full-screen) terminal connections are some of the powerful capabilities currently available using this protocol. Windows 2000/XP includes TCP/IP driver software. This manual also references a CIT-supplied client product, WS_FTP Pro for Windows XP.

See Section 2.1.4 for information on Macintosh connectivity. Contact the NIH Help Desk and ask for additional recommendations on client products for TCP/IP services.

Refer to Section 2.2 for the Online Services Directory with the Internet host names for TCP/IP connections to Titan.

2.1.1 WS_FTP Pro

CIT has purchased licenses from Ipswitch, the vendor for WS-FTP Professional 2007, so that Titan users will be able to obtain this client, free of charge, for conducting official government business. WS_FTP Pro, based on the file transfer protocol (FTP), provides fast transfer of files or collections of files between Internet-connected computers using Windows XP. This software and installation instructions can be downloaded from the Web. Go to:

http://titan.nih.gov

and click on NIH Connectivity Tools. Enter your Titan userid and RACF password and select WS_FTP Pro from the Connectivity tools menu. Follow the steps to install and configure WS_FTP Pro. Be sure to print out and follow the instructions, “Connecting to Titan's FTP Site.” For security reasons, we recommend that you don’t allow WS_FTP Pro to encrypt and store your password in its .ini file (i.e. when creating a site profile, do not check the box that says “Save Password”).

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 1.1. For more information on FDCC requirements, go to:

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

WS_FTP Pro Help
WS_FTP Pro includes a help menu featuring extensive help topics and online resources. This CIT manual provides some very basic instructions for WS_FTP Pro. If you need additional assistance, contact the NIH Help Desk.

2.1.2 QWS3270 PLUS for TN3270 Connections

CIT has a site license for QWS3270 PLUS, the commercial version of QWS3270, which provides 3270 (full-screen) terminal emulation for Windows-based desktop computers (Windows 2000/XP). QWS3270 PLUS is fully compatible with Titan. This 3270 client software for network connections is available without charge.

Titan users can download QWS3270 PLUS from the Web by pointing their browser to:

http://titan.nih.gov

and clicking on NIH Connectivity Tools. Before being allowed to download the software you will be prompted for your Titan userid and RACF password. Select QWS3270 Plus from the Connectivity Tools menu and follow the instructions.

The software includes instructions on how to set up additional 3270 sessions.
Note for IMS users: The "Port" must be set to 2325 for a direct unencrypted connection to IMS.

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 1.1. For more information on FDCC requirements, go to:

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

QWS3270 Plus Help
QWS3270 Plus includes online documentation. If you need additional assistance, contact the NIH Help Desk.

2.1.3 QWS3270 Secure for TN3270 Connections

CIT provides QWS3270 Secure, a 3270 (full-screen) terminal emulation package that supports Secure Sockets Layer (SSL). QWS3270 Secure allows Window-based desktop computers to connect to SSL-enabled IBM mainframes over a secure TCP/IP connection that is fully compatible with Titan.

QWS3270 Secure, which runs on 32-bit Windows (Windows 2000/XP), is available without charge. Titan users can download QWS3270 Secure from the Web by pointing their browsers to:

http://titan.nih.gov

and selecting NIH Connectivity Tools.

Select QWS3270 Secure from the Connectivity Tools menu and follow the instructions.

Because of the special secure port considerations, be sure to print and read the installation and configuration instructions before you install this product. QWS3270 Secure instructions also contain separate configuration directions for IMS/ADB users to allow them to connect directly to IMS.

Note for IMS users: The "Port" must be set to 2324 for a direct encrypted connection to IMS.

> 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 1.1. For more information on FDCC requirements, go to:
>
> http://cit.nih.gov/Support/FAQ/Fdcc/

QWS3270 Secure Help
QWS3270 Secure includes online documentation. If you need additional assistance, contact the NIH Help Desk.

2.1.4 TCP/IP Connectivity for the Macintosh

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 TN 3270X for the Macintosh

TN3270 or TN3270X allows a Macintosh user 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/

FTP for the Macintosh

Macintosh OS X (version10.2 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

Contact the NIH Help Desk for assistance with any Macintosh connectivity issues. See Section 1.1.

2.2 HOST NAMES

In order to connect to a remote computer or host across the network, you need to tell your software its destination. Just as if you were going to travel across town, you need the street address of where you want to end up. The "place to go" is identified using its Internet address. An Internet protocol (IP) address is a string of numbers separated by periods, e.g., "128.231.64.7."

While knowing the IP address of the remote computer will allow you to connect, it is easy to see that such numbers can be cumbersome to remember. For this reason many clients have the ability to work with Internet host names rather than IP addresses. The NIH facilities should be accessed using Internet host names. Using the previous example, instead of telling your friend you are going to 15634 Maple Drive, you would say, "I'm going to Harry's place." Another good reason to use the name is that Harry may move. His address will change, but it will still be known as Harry's place.

In order to use Internet host names you need to first provide your system with the address of the name server. This special remote computer is like a big "Yellow Pages" for the network, which looks up the name and returns the address. This look up is how your computer knows where to go. See Appendix B for a list of NIH name server addresses.

The Internet host names for Titan are shown in the following table:

Online Services Directory

Service	**Internet Host Name**
Full-Screen 3270	**TN3270.TITAN.NIH.GOV** (For SSL/TLS 3270, specify port 2323 using your client's syntax.)
Network File Transfer	
FTP	**FTP.TITAN.NIH.GOV**
SSH	**TITAN.NIH.GOV** (Specify port 9022 using your client's syntax.)

You should note that the spelling is not case sensitive. Upper or lowercase characters can be mixed in any way.

3 FTP FOR TRANSFERRING FILES

FTP stands for File Transfer Protocol. It is used for transferring files from one machine to another over the network.

In every FTP connection, there are two roles being played, that of the client machine and that of the server machine. The client machine is the local system that is initiating the connection; the server machine is the remote host that is receiving the connection.

To start a file transfer between your desktop computer and Titan, connect to host name ftp.titan.nih.gov using FTP client software, such as WS_FTP Pro (supplied by CIT) or the FTP command that comes with Windows or Unix. (For example, in Windows XP, you can to open a command prompt by clicking Start, selecting Programs, selecting Accessories, and then clicking Command Prompt. Or, you can use the Run command.) After making the connection, you can transfer files both to and from the remote host (i.e., Titan).

When logging on to Titan, you will first see a prompt requesting your userid. Enter your registered userid. The next prompt is for your RACF password. For most FTP clients, your password will not appear as you type. This is a security measure to protect your password. If for some reason the logon fails, as when you make a mistake typing your password, simply select Connect again. If you are using the FTP command, type *user* and press ENTER. The computer will then prompt you for the above information again. See Example 1 in Section 3.6.

WS_FTP Pro

To start using WS_FTP Pro, double-click your mouse pointer on the FTP application icon and select Titan from the list of configured sites. If Titan is not listed, you will have to configure it as a new site. Click on Tools, select Site Manager, and then click Create Site. To change the properties of a site listed (e.g., Internet address, userid), select Edit from the Site Manager.

The WS_FTP Pro software saves the logon information for you, so you need only enter it once, after which, you choose which connection to make from the Site Manager.

SSL/TLS (Secure Sockets Layer/Transport Layer Security) Connection via WS_FTP Pro

You can configure an SSL connection to Titan so that data transferred over the network will be encrypted. See Section 4.

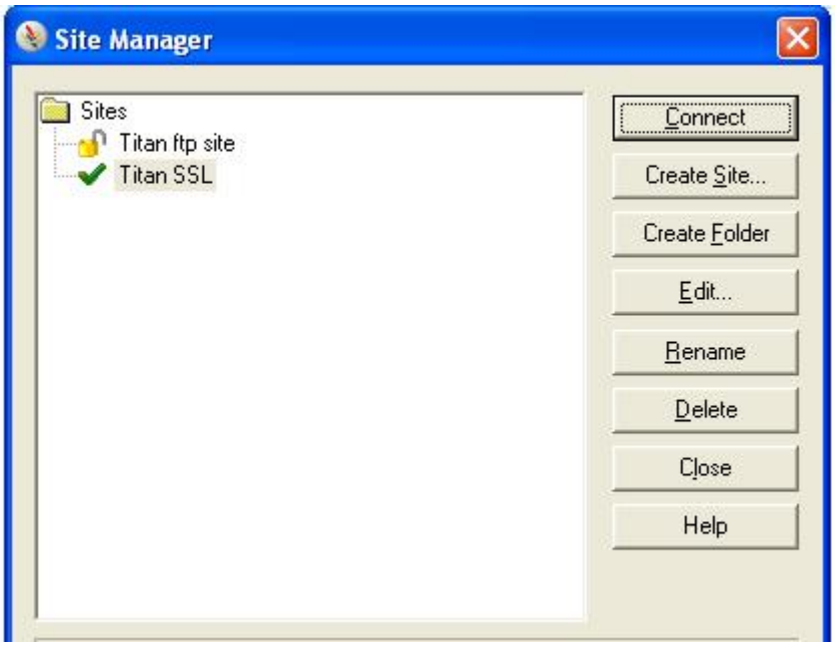

Figure 1: Site Manager Window in WS_FTP Pro

3.1 COMMON FTP COMMANDS

There are many FTP commands, but they will vary depending upon which TCP/IP software you are using. The examples in this manual are for the version of ftp that comes with Windows. If you have a different package, refer to that package's documentation for specific examples.

WS_FTP Pro

To access the FTP commands in WS_FTP Pro, make the connection to Titan. In the remote system white area (Titan FTP Site), right click the mouse button. A drop-down menu will offer Operations as an option. Click on Operations, and then select FTP Commands.

Select a file from the remote system and then click on the command you want. **Note:** some of the most common functions, such as rename and delete, appear as icons at the top of the remote site window and the My Computer window. Place your curser over the icons to learn their functions**.**

(Hint: right click on the small arrow in the Toolbar Options list and select Customize, then the Options tab. You can then select "Show text under icons," "Show ScreenTips in toolbars," or choose "Large icons.")

Some common functions, such as Transfer, appear directly under Operations (right click on the remote system white area first).

Any functions you see demonstrated here are probably duplicated in other FTP packages.

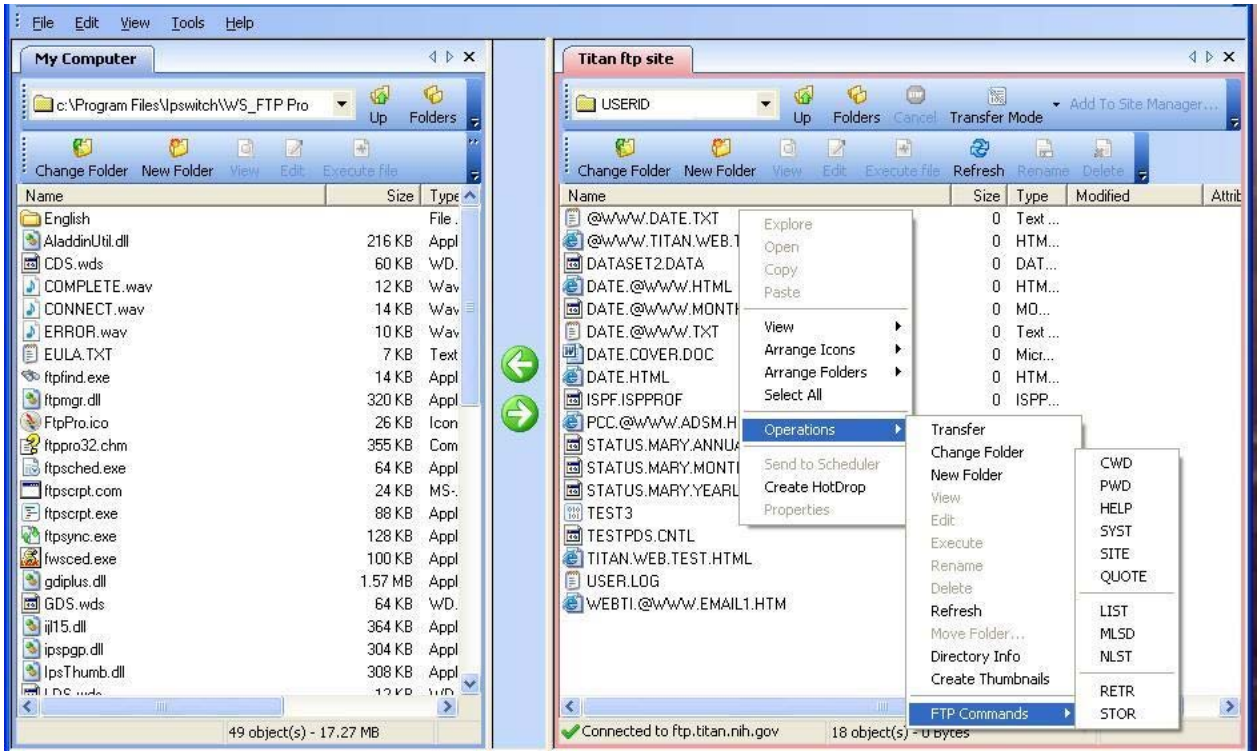

Figure 2: Local and remote system areas in WS_FTP Pro

3.1.1 Client Commands to the Remote Site

Note: even though the commands are given below in upper case, they are not case sensitive.

Command	Function
CWD	change the working remote directory
PWD	display the current working directory
HELP	obtain information about client commands
SYST	find out the operating system of the server
SITE	enter a command specific to the current site
QUOTE	enter any ftp command you want, unedited
LIST	send a list from the server to the passive data transfer process
MLSD	send a directory listing from the FTP site to the FTP client
NLST	send a directory listing (file names only) from the FTP site to the FTP client
RETR	transfer a copy of the file specified in the path name from the server to the client

STOR	cause the server to accept the data transferred via the data connection and to store the data as a file at the server site

3.1.2 Server Specific Commands

The following commands are sent following a QUOTE command:

Server Specific Command	Function
HELP	Use this command to get help for server commands (note that the HELP command, not preceded by QUOTE, gives information about client FTP commands).
SITE	This command allows you to specify parameters for creating a data set on Titan. WS_FTP Pro prefixes your entry with the word SITE and sends your entry to Titan without any editing.
SYST	This command displays the type of operating system at the FTP server.
RNFR, RNTO	If your client does not have a RENAME command you can use these two commands in sequence to rename a data set. The sequence is: RNFR <oldname> RNTO <newname>
DELE	If your FTP client does not have a DELETE command, you can use the server DELE command to delete a file on the server.

3.2 TRANSFERRING FILES

This section describes how to download files from Titan to your desktop computer and how to upload files from your desktop computer to Titan. See Section 4 for information on secure client-based file transfer.

3.2.1 DIR Command

Once you make the connection to Titan using FTP, you will be placed in a directory defined by your userid. All modifications, uploads and downloads occur within this directory by default.

The first step is often to view the contents of the directory (catalog). To do this, issue the DIR command. See Example 7, Example 8, and Example 9 in Section 3.6.

WS_FTP Pro

If connecting using WS_FTP Pro, the client automatically retrieves a listing of the files on the server. The list appears in the remote site window. With the Automatic Reconnect function of WS_FTPPro, you can choose to connect to a default site (e.g., Titan). To setup Automatic Reconnect, go to Tools and then Options to open the Program Options panel. If you select General, you will see the Auto-reconnect option box on the right.

Click the down arrow to select Connect to Default Site from the drop-down menu. The other options may also be useful.

3.2.2 GET Command

Once you know the names of the files, you can issue the GET command to retrieve a file stored on the remote host. The file will be copied onto your local drive.

To transfer the file test1 and rename it "testmine" in the default directory on the local site:

ftp> *get test1 testmine*

Note: Files (data sets) that are to be downloaded via FTP from the NIH Data Center should be stored on Titan in non-edit format. Data sets that are stored in WYLBUR's edit format will not be automatically converted to ASCII text files when downloaded via FTP to a desktop computer or workstation via the GET command. Use the WYLBUR SAVE (or RESAVE) command with the VARIABLE option to specify non-edit format rather than the default (edit format). For example:

save as myfile variable

Notice that the prefix "USERID." was not specified. This is because the logon userid is used as the prefix whenever an action is taken. See Section 3.5 to learn how to access files associated with a userid that is different from your logon userid.

WS_FTP Pro

When connected to an FTP server, WS_FTP Pro displays the contents of your local machine on the left, and the contents of Titan's FTP Server on the right. Indicate the type of transfer (ASCII, Binary, or Auto (based on file extension) from the Transfer Mode drop-down menu).

You can transfer files in several ways:

- Use the transfer arrow between your local machine and Titan's FTP server (Download/Upload).
- Use the Drag and Drop feature between the locations.
- Use the Copy and Paste commands between the locations.

You will be prompted for the destination name.

3.2.3 Put Command

The counterpart to the GET command is PUT. This command allows you to upload files to Titan. To transfer a file named “test” from your local default directory to Titan as a file named “testmine,” type the command:

ftp>*put test testmine*

Although many transfers involve text files, files containing data in a non-text form can be transferred using FTP. You must issue the IMAGE or BINARY command before transferring the file. This will stay in effect until you change back to text transfer mode using the ASCII command.

WS_FTP Pro
If you are using WS_FTP Pro, the default transfer mode is Auto (based on the file extension). Select ASCII from the transfer mode drop-down menu at the top of the remote site window before transferring a text file. You will be prompted for the destination filename.

3.2.4 Renaming a Data Set

To rename a Titan data set, use the FTP RENAME command. The syntax is:

Rename <oldname> <newname>

If you wish to rename a member of a PDS, make the PDS your working directory and then use the RENAME command. See Example 7 in Section 3.6.

WS_FTP Pro
The WS_FTP Pro client automates renaming a data set. Simply click on the Titan data set name in the remote site window. Click the rename icon from the toolbar above, and enter the new name in the Rename input box. Or, right click on the Titan data set name; choose Operations from the drop-down menu, then select Rename. The Rename input box appears where you can enter the new name.

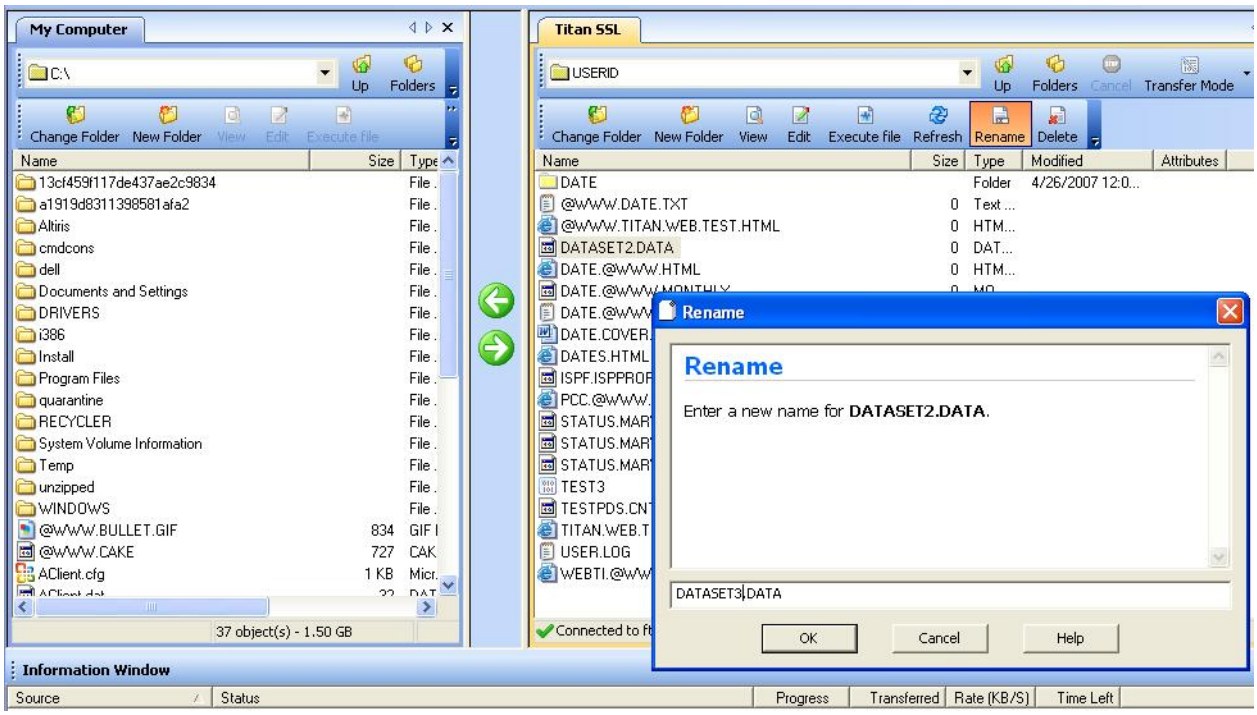

Figure 3: Renaming a data set with WS_FTP Pro

3.3 TITAN FTP SERVER SPECIFIC COMMANDS

FTP software allows you to send commands directly to the server machine (in this case Titan). However, when you wish to issue server specific commands from your FTP session, you must precede these commands by the QUOTE command. This passes the server commands directly to Titan, which then acts upon them. Otherwise, your commands will be interpreted by the local client package.

WS_FTP Pro
To issue the QUOTE command using WS_FTP Pro, right click in the white area of the WS_FTP Pro remote site window. At the drop-down menu, select Operations, then FTP commands, and then QUOTE. WS_FTP Pro sends the QUOTE command to the FTP site, unedited. It is up to you to determine the command syntax, depending on the host FTP site. Do not send any commands that require opening a secondary channel.

3.3.1 HELP Command

Use the QUOTE HELP command to request assistance from Titan. The syntax is

QUOTE HELP

For example, to get help with the SITE command on Titan:

ftp> *quote help site*

3.3.2 SITE Command and Sub-parameters (advanced file handling)

The SITE command establishes parameters to be used in storing the next file that you send to Titan. It allows you to specify DCB information (LRECL, BLKSIZE, RECFM), the amount of disk space required for the file, and many other important parameters. It is comparable to building a JCL DD statement for the data set before you transfer it.

The format of the SITE command is as follows:

QUOTE SITE <parameter>=<option>...

where
QUOTE specifies that site-specific commands follow

SITE sends command to remote machine

The default attributes for uploaded files are:

PRIMARY=30
SECONDARY=15
TRACKS

DIR=27 for a partitioned data set
LRECL=256
BLKSIZE=6233
RECFM=VB

Note: Be sure to issue the appropriate SITE commands BEFORE sending the file to the remote host. Multiple parameters may be specified in a single SITE command. If a SITE command is too long to fit on one line, use multiple SITE commands to specify extra parameters.

WS_FTP Pro
To issue SITE commands using WS_FTP Pro, right click in the white area of the WS_FTP Pro remote site window for the drop-down menu. Select Operations, then FTP commands, and then SITE. Enter a remote site-specific command in the box. WS_FTP Pro prefixes your entry with the word SITE and sends your entry to the FTP site without any editing. Be sure that you are using commands that are valid for this site.

Use the QUOTE STAT command to obtain the current values for the SITE command.

See Appendix A for a list of the most common parameters for the SITE command.

3.4 USING PREFIXES

Titan's file system does not use directories per se. However, you may still group files together by using prefixes to give the appearance of a directory.

A prefix is simply any part of the file name (up to the entire name). When specifying the name, you must include the entire segment of the name, e.g., for a file named

JANUARY.TEST.ONE

you may specify a prefix of

JANUARY or JANUARY.TEST

You may not, however, specify

JAN

as the segment "JANUARY" cannot be split.

Once the current prefix becomes JANUARY.TEST (the first two qualifiers of the data set name), you could then specify a prefix of ONE (the third qualifier of the data set). Then the new prefix (or directory) would be JANUARY.TEST.ONE.

In order to change the prefix, use the CD command. For information on using prefixes to access data sets that belong to another userid on Titan, see Section 3.5.

If you are logged on to the FTP server with the Titan userid USERID, the command CD STATUS would make your current prefix USERID.STATUS. If you then give the command CD MARY, the subsequent DIR command will display data sets beginning with the prefix USERID.STATUS.MARY. To view your current working directory, use the PWD command. Example 9 in Section 3.6 demonstrates changing the prefix and seeing the list of data sets within the directory (the new prefix).

The current directory (as set with the CD command) determines where uploaded files are stored. When preparing to download files, the current directory must also be set correctly.

WS_FTP Pro
When using WS_FTP Pro, click on the Change Folder icon.

When the Change Directory input box appears, type the name of the remote directory using the desired prefix. For example, if the userid **'USERID.'** appears in the box and you want to change the directory to USERID.manual., click on the Change Folder icon for the remote site and type *manual.* in the box that appears. If you have already switched directories, you can return to the top level directory by typing '*userid'* (with quotes) in the Change Directory box. You can also return to the top level directory by using the drop-down directory window.

3.5 ACCESSING ANOTHER USERID'S DATA SETS

When you initiate an FTP session, the prefix is automatically set to the userid with which you logged on. A user logged on with userid USERID2, will default to a prefix of USERID2.

You can change the prefix during the course of an FTP session. To change the prefix to another userid, put the prefix in quotes. For example, the command

cd 'USERID1'

will make USERID1 the current prefix rather than your logon userid (USERID2).

If you use the CD command without putting the prefix in quotes, the prefix you specify will be added to your current prefix rather than replacing it. For example, if your current prefix is USERID2 and you issue the command

cd $KKK

your prefix will become USERID2.$KKK.

But if you use the command

cd '$KKK'

your prefix will become $KKK (a different userid)

When attempting to alter [upload] files under a different userid, you must have the appropriate RACF (Resource Access Control Facility) authority. Refer to the *Titan User's Guide* for information on RACF.

WS_FTP Pro

To access data sets under a different userid with WS_FTP Pro, select the change folder icon for the remote host. Replace the userid that appears in the window with the new userid. Type the new userid between single quotes or simply replace the userid in the folder window before the'.' This becomes the new prefix (directory).

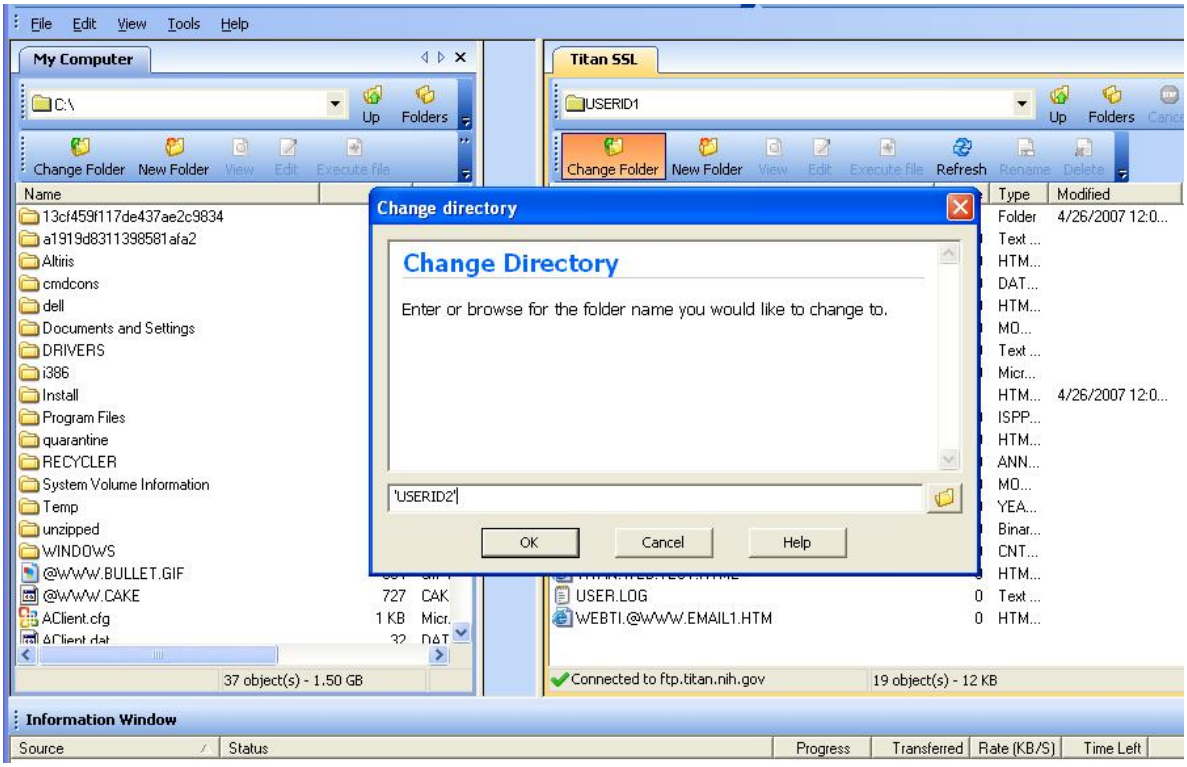

Figure 4: Changing the userid with WS_FTP Pro

3.6 FTP COMMAND LINE EXAMPLES

Example 1: Establishing a FTP session and changing the prefix:

At the command prompt:

C:\Documents and Settings\user\My Documents>*ftp ftp.titan.nih.gov*
Connected to titan.nih.gov.
220-FTPD1 IBM FTP CS V1R7 at titan.nih.gov, 09:31:10 on 2008-07-16.
220 Connection will close if idle for more than 1440 minutes.
User (titan.nih.gov:(none)): *userid1*
331 Send password please.
Password:
230 USERID1 is logged on. Working directory is "USERID1.".
ftp> *cd manuals* < ------ No quotes around prefix
250 "USERID1.MANUALS." is the working directory name prefix.
ftp> *cd 'userid2'* < ------- Quotes around prefix
250 "USERID2." is the working directory name prefix.
ftp> *quit*
221 Quit command received. Goodbye.

Example 2: Uploading a file and changing its name:

H:\Temp>*ftp ftp.titan.nih.gov*
Connected to titan.nih.gov.
220-FTPD1 IBM FTP CS V1R7 at titan.nih.gov, 10:07:44 on 2007-06-15.
220 Connection will close if idle for more than 1440 minutes.
User (titan.nih.gov:(none)): *userid*
331 Send password please.
Password:
230 USERID is logged on. Working directory is "USERID.".
ftp> *put pcput.txt putdemo.txt*
200 Port request OK.
125 Storing data set USERID.PUTDEMO.TXT
250 Transfer completed successfully.
ftp: 602618 bytes sent in 1.38Seconds 437.63Kbytes/sec.

Example 3: Downloading a file and changing its name:

H:\Temp>*ftp ftp.titan.nih.gov*
Connected to titan.nih.gov.
220-FTPD1 IBM FTP CS V1R7 at titan.nih.gov, 12:19:23 on 2007-06-12.
220 Connection will close if idle for more than 1440 minutes.
User (titan.nih.gov:(none)): *userid1*

331 Send password please.
Password:
230 USERID1 is logged on. Working directory is "USERID1.".
ftp> *get putdemo2.txt getdemo.txt*
200 Port request OK.
125 Sending data set USERID1.PUTDEMO2.TXT
250 Transfer completed successfully.
ftp> ftp: 237 bytes received in 0.03Seconds 7.65Kbytes/sec.

Example 4: Use of SITE command:

To upload the next file as an FB, LRECL=80 data set with 3 cylinders primary space and 1 cylinder secondary space, use a command such as the following:

quote site recfm=fb lrecl=80 blksize=8000 primary=3 secondary=1 cylinders

Example 5: Submitting a batch job to Titan

To submit a batch job to Titan through FTP, use the command:

quote site filetype=jes
put <local filename>

The job will be submitted and will be run under the userid you used to establish the FTP session.

Note: If you wish to check on the status of your job or retrieve its output to your computer, the job name should consist of your userid followed by a single letter or digit. To find the status of jobs, use the DIR command while in JES mode. To fetch a job, use the command:

get <jobid>.x <pc_filename>

where jobid is JOB followed by the 5-digit job number as indicated by the output of the DIR command.

'JOB' can be abbreviated 'J'.

PC_FILENAME is the name of the file on your computer into which you wish the output to be stored.

The 'x' can be either lowercase or uppercase.

For example, the command

get J00001.x myjob.out

would put the output of JOB00001 into the workstation file myjob.out. To resume regular file transfers, issue the command *quote site filetype=seq.*

ftp> *quote site filetype=jes*
200 SITE command was accepted
ftp> *put h:\temp\ttnjob.txt*
200 Port request OK.
125 Sending Job to JES internal reader FIXrecfm 80
250-It is known to JES as JOB08348
250 Transfer completed successfully.
ftp: 464bytes sent in 0.00Seconds 464000.00Kbytes/sec.
ftp> *dir*
200 Port request OK.
125 List started OK
USERID1 JOB08348 OUTPUT 4 Spool Files
250 List completed successfully.
ftp: 74 bytes received in 1.06Seconds 0.07Kbytes/sec.
ftp> *get j08348.x h:\temp\ttnout.txt*
200 Port request OK.
125 Sending all spool files for requested Jobid
250 Transfer completed successfully.
ftp: 16057 bytes received in 0.63Seconds 25.69Kbytes/sec.
ftp> *quote site filetype=seq*
200 SITE command was accepted

Example 6: **Renaming a sequential data set:**

ftp> *rename putdemo.txt putdemo2.txt*
350 RNFR accepted. Please supply new name for RNTO.
250 USERID.PUTDEMO.TXT renamed to USERID.PUTDEMO2.TXT

Example 7: **Getting a list of members of a PDS (saved in ISPF) that is not a load library and renaming a member:**

ftp> *cd vps.exec*
250 The working directory "USERID.VPS.EXEC" is a partitioned data set
ftp> *dir*
200 Port request OK.
125 List started OK

```
 Name     VV.MM   Created       Changed      Size  Init   Mod   Id
MAILX     01.01 2006/06/19 2008/07/14 09:45   784   784     0 USERID
REPORT    01.01 2006/06/19 2008/07/14 09:46    99    99     0 USERID
REPORTN   01.01 2006/06/19 2008/07/14 09:46    23    23     0 USERID
REPORTO   01.01 2006/06/19 2008/07/14 09:47    44    44     0 USERID
RPTSOL    01.01 2006/06/20 2008/07/14 09:47    50    50     0 USERID
```

```
SYS2RPT   01.01 2006/06/20 2008/07/14 09:48   101   101     0 USERID
TEST      01.01 2006/06/20 2008/07/14 09:49    21    21     0 USERID
TEST2     01.01 2006/06/20 2008/07/14 09:49    30    30     0 USERID
```

250 List completed successfully.
ftp: 644 bytes received in 0.02Seconds 40.25Kbytes/sec.

ftp> *rename test2 test3*
350 RNFR accepted. Please supply new name for RNTO.
250 USERID.VPS.EXEC(TEST2) renamed to USERID.VPS.EXEC(TEST3)
ftp>

Example 8: **Getting a list of members of a PDS that is a load library.**

Note: FTP considers any PDS with the RECFM=U to be a load library**.** Since WYLBUR edit format data sets are stored as RECFM=U, FTP displays them in the load library format.

ftp> *cd tests*

250-The working directory may be a load library
250 The working directory "USERID.TESTS" is a partitioned data set
ftp> *dir*
200 Port request OK.
125 List started OK

```
Name      Size   TTR   Alias-of AC --------- Attributes ------- Amode Rmode
REPORT1     010000 000604             DC NX       RF              ANY   24
REPORT 2    000000 000606          16 DC NX                       31    ANY
REPORT3     000000 000608             DC NX                       ANY   ANY
REPORT4     000000 00060A             DC NX                       24    24
REPORT5     000000 00060C             DC NX                       ANY   ANY
REPORT6     000000 00060E             DC NX                       ANY   ANY
REPORT7     000000 000610             DC NX                       ANY   24
REPORT8     000000 000612             DC NX                       24    24
```

250 List completed successfully.
ftp: 729 bytes received in 0.00Seconds 729000.00Kbytes/sec.
ftp>

Example 9: Changing the prefix and seeing the list of data sets within the directory

ftp> *pwd*
257 "'USERID.STATUS.'" is working directory.
ftp> *cd MARY*
250 "ZZYZDDL.STATUS.MARY." is the working directory name prefix.
ftp> *dir*
200 Port request OK.
125 List started OK

```
Volume Unit    Referred Ext Used Recfm Lrecl BlkSz Dsorg Dsname
DSL126 3390   2008/07/11  1    6  VB   11476 11476  PS  ANNUAL
DSL126 3390   2008/07/11  1    1  VB     256  6233  PS  MONTHLY
DSL126 3390   2008/07/11  1    5  VB   11476 11476  PS  YEARLY
```

250 List completed successfully.
ftp: 258 bytes received in 0.00Seconds 258000.00Kbytes/sec.
ftp>

4 SECURE CLIENT-BASED FILE TRANSFER

Users can transfer data securely to and from Titan using SSL (Secure Sockets Layer) FTP. When using SSL FTP, all data and passwords transmitted over the network are encrypted. First, you must configure your FTP client software to request an SSL connection with the Titan FTP.

4.1 SSL/TLS FTP BETWEEN TITAN AND A DESKTOP COMPUTER

WS_FTP Pro

With WS_FTP Pro, you can configure an SSL/TLS connection to Titan so that data transferred over the network will be encrypted.

You need to define another site profile:

- Select File, then Connect to open the Site Manager window.
- Click on Create Site. This opens a site wizard prompting you to name the new site.
- Type a name for the new site (e.g.; *Titan SSL*), then click Next.
- From the Connection Type drop-down menu, select FTP/SSL (AUTH SSL) from the drop-down site manager window, then click Next.
- Enter the server address ftp.titan.nih.gov where prompted.
- Click Next and enter your Titan userid (the password is not required), then click Next again.
- At the Finish screen, verify the information and uncheck the Connect to this site-box at the bottom of the page. Click Finish.

You should now be back at the Site Manager window, and your newly defined site profile should be listed there.

To verify the newly defined Titan SSL profile, select the new site and click on Edit. This should open the Site Options window.

- Click on Advanced on the left hand side of the Site Options window. The Server type should be FTP/SSL (AUTH SSL).
- Click on SSL, under Advanced on the left hand side of the Site Options window, and verify that Client certificate = NONE and the choice boxes below are unchecked.
- Click OK, and the newly defined site profile should be ready for performing secure transfers to and from Titan.

To verify your secure SSL FTP connection:

- Open an SSL connection to Titan using WS_FTP Pro
- Check for the small padlock icon that should show on the bottom bar of the right hand remote Titan window displaying your current Titan directory.

If you have an older version of WS_FTP Pro that doesn't support SSL/TLS, go to:

http://titan.nih.gov

and click on NIH Connectivity Tools, to download the current version of WS_FTP Pro and the CIT documentation for installing and configuring it.

4.2 SSL FTP BETWEEN TITAN AND ANOTHER IBM MAINFRAME

It is also possible to use SSL/TLS FTP to transfer data between Titan and another IBM mainframe system. In this case, Titan could be either the SSL FTP server or the SSL FTP client. The configuration and certificate process involved is fairly complex. If you need to perform SSL/TLS FTP transfers between Titan and another IBM mainframe system, please contact the NIH Help Desk and request assistance.

5 SECURE WEB-BASED FILE TRANSFER

Titan offers a Web-based secure file transfer that takes advantage of SSL/TLS, which provides encryption over the network. The only software that is 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.

5.1 SECURE FILE UPLOADS

Secure file upload requires that you define the characteristics of the mainframe data set to be created by filling in several fields. Click the link for help for descriptions of the headings.

Select the transfer settings to be used. You can provide new transfer settings or reuse a set of previously saved transfer settings from the list.

- The first time you use the Secure File Transfer (SFT), the New Entry option is automatically selected. If you assign a settings name and specify the save settings option, the new transfer settings will be saved for reusing under that name. The next time you use the Secure File Transfer facility, SFT will display a list of the saved transfer settings names for you to select from. If you do not wish to save your settings, Click the N radio button under Save Settings

To upload a file:

- Type the name of your file under Titan Dataset Name (required).
- Specify a Record Length (required).

If you want to save your settings:

- Specify a Settings Name.
- Click the Y radio button under Save Settings to save your settings.

After entering the file to transfer (or using Browse to find it), click Begin Upload.
You can create and save more than one data set setting.

Deleting Saved Settings
You can also delete saved entries from this Web page. When you open the Upload screen, you will see the list of saved entries at the top. Click on Delete Saved Entries.

You will get a screen listing all your saved entries. Check the box in front of the entries you want to delete and click Delete.

5.2 SECURE FILE DOWNLOADS

To download a file from Titan, choose the download file option from the Secure File Transfer page.

- Type the Titan dataset name of the data set to be downloaded—including the userid without quotes, as in *userid.test*.
- Indicate the type of transfer (ASCII, Binary, or Auto (based on file extension) from the Transfer Mode drop-down menu).
- Click Begin Download.

You will then be able to open or save the file, or cancel the download. If you save the file, you can rename it on your local machine and choose the location. The default name for the downloaded file consists of the last two qualifiers of the data set name.

6 SSH (SECURE SHELL)

Titan provides the ability to directly transfer data sets and automatically translate between the ASCII and EBCDIC character sets via the SSH protocol. Titan SSH data set transfers are carried out in batch jobs. SSH is available on Titan as part of Titan's Unix System Services (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.

Additional Information

For additional information on SSH transfers, refer to the *Titan Batch Processing* manual (under "Transfer Utilities").

For information on SSH transfers from a remote host by a user who does not generally access the Titan system, go to:

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

7 TN3270 FOR INTERACTIVE SESSIONS

You can establish interactive sessions to Titan via the network using a client that supports the TN3270 protocol. This protocol allows you to establish a full-screen interactive session with an appropriate host, such as Titan. See Section 2.1 for information about software available for establishing an interactive session with Titan. The host name for Titan interactive sessions is tn3270.titan.nih.gov.

When you establish a connection, you will see a terminal screen with the title "Application Selection."

- Enter the application you wish to access in the first field at the bottom of the screen. For example, type *NIHTSO* for TSO under Titan. You can type your userid in the second field at the bottom of the screen. Press enter.
- The next screen will prompt you for your RACF password and give you the opportunity to change your password. You will also be prompted for your userid if you did not provide it on the first screen. Type this information and press Enter.
- At the CIT/Titan Primary Option Menu, there will be a list of various tasks and applications. If you want to use WYLBUR, type the command *TSO WYLBUR* on the terminal screen command line.

Refer to the *Titan User's Guide* for additional information on establishing interactive sessions.

8 DATA SET CONVENTIONS AND OTHER IMPORTANT CONSIDERATIONS

Be sure to adhere to the standard conventions for storing and naming data sets. These standards include the following:

- Data set names (disk or tape) must begin with either a Titan userid or account.
- User-specified data set names can not 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.
- All data sets must be cataloged.

See the *Titan User's Guide* for more information.

9 APPENDICES

Appendix A - Details on the NIH Titan SITE Command

SITE may be used for host-dependent FTP parameters.

Successive SITE commands are cumulative and remain in effect until changed. The minimum abbreviation for each of these common parameters is shown in capital letters.

Syntax: SITE <SITE parameter>, ...

<SITE parameter> ::=
MGmtclass=<management class>
DATAClass=<data_class>
FILEtype=<value>
PRImary=<amount>
SECondary=<amount>
TRacks
CYlinders
BLocks
DIrectory= <blocks>
RECfm= <record format>
LRecl= <logical record length>
BLKsize= <max physical block>
TRAILingblanks
NOTRAILingblanks
ASAtrans
NOASAtrans

Notes:
(1) The SITE command verb is followed by a list of keyword parameters. Each keyword may be shortened as far as indicated by the capital letters.
(2) A single FTP command is limited to 80 characters. In the (unlikely) event that a SITE command exceeds 80 characters, it can be broken into two or more successive SITE commands.
(3) If an error is found in parsing a SITE parameter, the system generates an error message indicating the bad parameter. The faulty parameter and all following parameters will be ignored. The user must then re-enter the parameters.

Operands:

MGMTCLASS=<management class >

Specify the management class for the file that you will be transferring to Titan. Titan currently supports the following management classes: DISK2YR, DISK7YR, LONGTERM, NOBACKUP, and TEMP.

(**Note:** The SMS management class tells the system how to handle backups and automatic scratches. For more information about these management classes, see the discussion on the UNIT parameter in the *Titan Batch Processing* manual.)

DATACLASS

Specify a data class for a new data set. The data classes are names predefined by the installation and have assigned DCD and SPACE parameter values.

FILETYPE=<value>

JES

Submit transferred files as batch jobs. If this parameter is used, the next files transferred to Titan are not stored, but instead are submitted as a JCL batch job. To resume regular file transfer, use FILETYPE=SEQ. Since WYLBUR RUN command parameters such as HOLD and NOPURGE are not available as subparameters to this command, users should be sure to include all appropriate control statements in their JCL file. After the FILETYPE=JES command is issued, the next file transferred must be transferred as an ASCII text file.

SEQ

Submit transferred files as data sets. If this parameter is used, the next files transferred to Titan are stored as data sets. This is the default.

PRIMARY=<amount>

SECONDARY=<amount>

Specify the primary and secondary disk space allocation. These parameters set the primary and secondary space allocations in tracks, cylinders, or blocks. The default is tracks, but this may be changed using the CYLINDERS or BLOCKS parameter. Include the CYLINDERS parameter in the SITE command string if the space is to be allocated in cylinders. Use the BLOCKS parameter to allocate the space in blocks.

TRACKS

Allocate space in tracks. Track allocation is the default.

CYLINDERS

Allocate space in cylinders.

BLOCKS

Allocate space in blocks.

DIRECTORY=<blocks>

Specify an integer number of 256-byte blocks to be reserved for PDS directory. One block holds from 3 to 20 member entries. This parameter is required to create a new PDS.

RECFM=<record format>

Specify the record format of the file to be uploaded to Titan. Options include:

Record Format	**Description**
F	fixed
FB	fixed block
V	variable
VB	variable blocked
U	unformatted

LRECL= <logical record length>

Specify the logical record length of the file.

BLKSIZE=<max physical block>

Specify the block size of the file.

Explicitly set the "DCB" or format attributes of a new data set. If the data set is being created, these parameters override the default data set attributes.

If the data set exists, these parameters must exactly match the corresponding attributes of the data set.

TRAILINGBLANKS

Include trailing blanks when downloading a RECFM=FB data set.

NOTRAILINGBLANKS

Strip trailing blanks when downloading a RECFM=FB data set. Specify TRAILINGBLANKS to revert.

ASATRANS

Use with downloading print format data sets (i.e., data sets containing a carriage control character in column 1). This option causes the carriage control character in each record to be excluded when downloaded. By default, the carriage control character is downloaded along with the rest of the record.

NOASATRANS

Include the carriage control character in the download after having specified ASATRANS.

Appendix B - Important Host Names and Addresses

Titan Services

These are the corresponding Internet addresses for the Internet host names listed in this manual. These addresses should only be needed in conjunction with the use of a firewall and are subject to change.

Host name	IP Address
FTP.TITAN.NIH.GOV#2323 (for SSL)	128.231.64.34
TITAN.NIH.GOV#9022 (for SSH)	128.231.64.34
TN3270.TITAN.NIH.GOV	128.231.64.34

Name Servers

TCP/IP users at NIH should configure their networking to use the name servers in the following order:

	Name Server	IP Address
1	ns.nih.gov	128.231.128.251
2	ns2.nih.gov	128.231.64.1
3	ns3.nih.gov	165.112.4.230

By having backups for the name servers, TCP/IP network users at NIH can be assured of the most reliable service possible.

For the most current information, go to:

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

Appendix C - Glossary

Term	Explanation
3270 Telnet	A special form of Telnet that emulates the 327x line of IBM full-screen terminals.
address	The address of a computer is its unique location code on the Internet. Each host's address MUST be unique to itself. If I am sending information to someone else on the network, I need to know that person's address, and they need to know mine, as if we were sending letters back and forth. In fact, data sent over the Internet is sent in the form of a little electronic envelope called a packet.
client	A computer program that requests information from a remote partner. The partner is usually called a server. The client always initiates requests.
FTP	File Transfer Protocol. A set of predefined rules followed by two computers in order to exchange information across a TCP/IP network.
host	Any computer that runs a network program and allows individuals to log in and/or transfer files to and from it .
Internet	The Internet is just what its name states, an inter-network, or a network of smaller networks all using the TCP/IP protocol.
Job	A group of instructions designed to be executed on a computer.
name server	A computer out on the network that returns the address for a name sent to it. A computerized directory.
NIHnet	The NIH wide-area network, an integrated wide area network that connects local area networks, Titan, and the Internet.
packet	This is the heart of data transfer on the network. Files are broken up before transmission and then shipped out over the Internet in packets, which are decoded and reassembled at the other end.
protocol	A protocol is the agreed-upon conventions that two computers will use when conversing with each other. Two computers trying to communicate using different protocols, is like two people trying to carry on a conversation when one speaks just French and the other speaks only Japanese. It just won't work.
server	A computer program that waits—listening to the network for requests for service.

Term	Explanation
SSH	Secure Shell. SSH is both a computer program and an associated network protocol designed for logging into and executing commands on a networked computer. SSH provides secure encrypted communications between two untrusted hosts over an insecure network
SSL/TLS	Secure Sockets Layers. SSL and its successor TLS (Transport Layer Security) are means of encrypting communications across Internet connections. SSL/TLS works by utilizing Public Key Technology to allow a client and server to agree on an encryption method and to verify the server to the client.
TCP/IP	Transmission Control Protocol/Internet Protocol. This is one of the most common network protocols, and the one discussed herein. TCP/IP is a useful and versatile protocol, designed as a standard that allows different types of computers, from large central servers to desktop computers to talk to and understand each other.
Telnet	A protocol designed to allow an interactive session to be carried out over a TCP/IP-based network.

INDEX

Network Access to the Titan System

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Is the Manual:

	YES	NO
Clear?	☐	☐
Well organized?	☐	☐
Complete?	☐	☐
Accurate?	☐	☐
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