

TFTP Server

version 1.0

for Microsoft ® Windows NT ™

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TFTP Server is multi-threaded Trivial File Transfer Protocol daemon for the Microsoft Windows NT operating system. The program runs as a native Windows NT service and is designed to comply with RFC 1350, "The TFTP Protocol".

TFTP Server is shareware. Please read the README.TXT and REGISTER.WRI files before using this program.

IMPORTANT!

Read the section entitled *Security Issues* before installing this program.

Contents of this package

The TFTP Server package should contain six files:

TFTPDS.EXE	The executable portion of TFTP Server
TFTPDS.CPL	The Control Panel configuration program
TFTPDS.DOC	The TFTP Server documentation in Microsoft Word 2.0 format
TFTPDS.WRI	The TFTP Server documentation in Windows Write format
REGISTER.WRI	The TFTP Server license agreement and registration form
README.TXT	General TFTP Server notes in text format

Obtain a new copy of the TFTP Server package if you do not have all of these files.

Getting started

You should copy the executable file (TFTPDS.EXE) to a permanent directory before you install TFTP Server. The ‘\system32’ directory is fine, although not required. Note that you will need to remove, then re-install, TFTP Server if you move the executable file after it has been installed.

You should copy the Control Panel program (TFTPDS.CPL) to the ‘\system32’ directory. This file must be in your ‘\system32’ directory in order for the TFTP Server Control Panel applet to appear.

The TFTP Server executable file, TFTPDS.EXE, accepts one of three switches from the command line:

- install
- remove
- version

Installation

From the command prompt, run TFTPDS.EXE with the -install switch to install the service.

If TFTP Server encounters an error while installing the service, it responds with “Error installing the TFTP Server service”. If you encounter this error while attempting to install the service, ensure that you are logged into the system as a user that has access rights to the system registry. Note that installation will fail if the service is already installed. In order to re-install the service, you must first remove it by using the -remove switch.

By default, the TFTP Server service will install itself to run from within the local system account. If you decide to run TFTP Server in a restricted user account, note that the service may not have the right to post events to the system’s event log. If you need to see the events that TFTP Server is posting, configure the service to run in a less restricted account.

After TFTP Server is successfully installed, you should configure it using the TFTP Server applet in the Control Panel.

Note:

TFTP Server may be installed and configured on a remote machine if the remote machine is running the Remote Command Line service (available with the Windows NT 3.5 resource kit). The following steps show how to remotely install and configure TFTP Server:

1. Start the Remote Command Line service if it is not already running.
2. Copy the TFTP Server distribution files to an appropriate directory on the remote machine.
3. Copy the Control Panel configuration program, TFTPDS.CPL, to the remote machine's '\system32' directory.
4. Copy the Control Panel configuration program, TFTPDS.CPL, to the local machine's '\system32' directory.
5. Connect to the remote machine's command line by typing **RCMD \\
servername** from the local command line.
6. Run **TFTPDS.EXE** on the remote command line with the **-install** switch.
7. Start the TFTP Control Panel applet from within the local machine's Control Panel.
8. Use the Network button to connect to the remote machine.
9. Configure the remote machine's TFTP Server options, then click OK.

Configuration

TFTP Server is configured via the TFTP Server applet in the Control Panel. This applet allows you to configure the default directory, maximum retransmit value, timeout value and miscellaneous file transfer options for the service. Explanations of the different values are given below.

Default Directory

The *Default Directory* setting should specify the directory that the TFTP Server will use for transfers that do not specify a root portion of the pathname (ex: "pub\file.txt"). An example of this value is *d:\tftp*. The default value is the directory in which the file "TFTPDS.EXE" resides. You will probably want to change this.

Operation

The Operation group allows you to define operating characteristics of the TFTP Server program.

The *Inactivity timeout* setting controls the number of seconds the TFTP Server will wait during a period of inactivity before retransmitting its previous packet. This setting can be any value between 1 and 255 seconds. The default value is 3 seconds.

The *Maximum retransmits* setting controls the maximum number of times the TFTP Server can retransmit a failed packet to a client before aborting a file transfer operation. This setting can be any value between 0 and 50. The default value is 5 retransmits.

The *Maximum retransmits* and *Inactivity timeout* settings, when multiplied together, specify the total amount of time that a service thread may "hang around" in the

system when a client is no longer responding.

Warning! *If these values are set to their maximum limits, a service thread will retransmit for more than three and a half hours before aborting a failed transmission.*

File Transfer Options

The File Transfer Options group allows you to configure aspects of the TFTP Server related to the transfer of files.

The Overwrite if file exists option controls whether or not the TFTP Server allows an incoming file to overwrite an already existing file. If this box is checked, existing files can be overwritten. The default is unchecked.

The Limit to default directory option is used to specify whether or not TFTP read and write requests are limited to the default directory. If this box is checked, any read or write request for a file not within the default directory (or any of its subdirectories) will fail with an access-denied error. The default is unchecked.

The Log file transfers option allows you to specify whether or not the TFTP Server will generate a log of all file transfers. When checked, this option allows you to enter the name of a TFTP Server log file. If the filename you specify does not exist, the TFTP Server will create the file upon startup, provided you have granted the service enough access rights to do so. When the log file name is specified without using a fully qualified pathname (for example, “tftps.log”), it is assumed to be in (or be created in) the TFTP Server Default Directory.

If you decide to specify a fully qualified pathname for the log file using a directory other than the Default Directory, ensure that the TFTP Server has enough access rights to create and write to the log file. Note that even if the TFTP Server log file resides in the Default Directory, a request to read this file via TFTP will fail. The default setting for the log file name is “tftps.log”.

Defaults button

The Defaults button allows you to reload the TFTP Server default settings at any time. If you reload these settings, ensure that you save them by clicking the OK button so the settings can take effect.

Network button

The Network button allows you to remotely configure a server’s TFTP Server configuration. After clicking this button, you are prompted to enter a server name. The OK button then connects you to the remote server, allowing you to modify its TFTP Server configuration. The server you are currently administering is always displayed in the TFTP Server Configuration window title.

The TFTP Server does not need to be installed on a machine in order for the TFTP Server Control Panel applet to function. Clicking the applet will cause a warning that the TFTP service isn’t installed on the local machine, but you are then given the chance to click the Network button and connect to another computer.

Removal

The -remove switch will de-register the TFTP Server service from the system.

If the TFTP Server encounters an error while removing the service, it responds with “Error removing the TFTP Server service”. If you encounter this error while attempting to remove the TFTP Server, ensure that you are logged into the system as a user that has access rights to the system registry. Note that removal will fail if the service has not been previously installed using the -install switch.

The TFTP Server Control Panel applet is not removed when this switch is specified. In order to remove the TFTP Server Control Panel applet, remove the “TFTPDS.CPL” file from the ‘\system32’ directory.

Version

The -version switch prints the TFTP Server version number, the copyright notice and the author’s name.

Operation

After successful installation, you can use Server Manager or the “Services” applet in the Control Panel to Start, Stop, Pause or Continue the TFTP Server service. The TFTP service responds to the pause command by rejecting new TFTP requests, but it does not interrupt any currently active file transfers. The Continue command instructs the TFTP Server to resume processing of new TFTP requests.

The Stop command will stop the TFTP Server service and all active file transfers.

Notes on the Service

The TFTP Server accepts requests for read and write of files in either binary or ASCII mode (referred to as octet and netascii modes in the RFC). Files that are transferred in binary mode are transferred byte by byte, resulting in a mirror image of the original file. This mode should be used for transferring any file that is not in a readable text format.

Files transferred in ASCII mode are translated into or out of Windows NT ASCII text format. The TFTP Server will also translate locally stored files that are in a different ASCII text format when sending that file in ASCII mode. An example of this is the TFTP Server translating a Unix ASCII text file which has been requested for ASCII mode read.

Note that your TFTP client may report a number of bytes transferred that does not correspond to the actual file size when transferring a file in ASCII mode. This is due to the extra overhead associated with the netascii translation.

Notes on TFTP Client Software

When using a TFTP Client program to transfer files to or from the server, the mode, remote host, source file and destination file are usually specified. Consult the documentation that is supplied with your TFTP client program for details on how to specify these.

If you make a Read Request to the TFTP Server using your TFTP client, the source file name can be in one of a few formats. The following are examples of these formats, with accompanying explanations.

<i>filename.ext</i>	The file is expected to be in the TFTP Server default directory. The default directory can be configured from the TFTP Server applet in the Control Panel.
<i>\pub\bin\filename.ext</i>	The file is expected to be in the \pub\bin directory. “\pub” is considered a sub-directory of the root directory.
<i>pub\bin\filename.ext</i>	The file is expected to be in the \pub\bin subdirectory of the default directory. If the default directory is defined as “d:\tftp”, then this file should be at “d:\tftp\pub\bin\filename.ext”.

If you make a Write Request, these assumptions apply to the destination file name. Forward slashes may be used instead of backslashes when specifying a filename.

Note that the TFTP Server will not restrict access to the default directory unless you have configured it to do so using the TFTP Server Control Panel applet. See the section entitled *Configuration* for instructions on how to limit access to the default directory only.

Security Issues

The TFTP Protocol, as defined in RFC 1350, does not provide a mechanism for user authentication. This can create potentially serious security problems for a system running the TFTP Server if the service does not run with well-defined security restrictions. The easiest way to restrict access to a server’s files via TFTP is to enable the option *Limit to default directory* from within the TFTP Server Control Panel applet. Enabling this option will cause any request for files, either read or write, that do not fall under the defined default directory to fail with an access-denied error. When this option is enabled, files that are in subdirectories of the default directory are accessible via TFTP.

You should choose your default directory carefully, and be aware that any files within it are potentially open to unauthorized read or write.

Log File Format

The TFTP Server log file is a standard ASCII file which can be opened with Windows NT Notepad. The log file contains details about TFTP file transfers, one line per transfer. For best results, you should view the log file with a fixed-sized font. The format of the log file is:

<u>Status</u>	<u>Date</u>	<u>Time</u>	<u>Client</u>	<u>Mode</u>	<u>Description</u>	<u>Filename</u>
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Status:					“E” indicates an error occurred during the file transfer A blank entry indicates a successful transfer	
Date:					The date the file transfer was started, in the format <i>mm/dd/yy</i>	
Time:					The time the file transfer was started, in the format <i>hh:mm:ss</i>	
Client:					The IP address of the system that requested the transfer	
Mode:					Octet or netascii, depending on which transfer mode the client requested	
Description:					Additional text describing the file transfer	
Filename:					The name of the file that was requested for transfer	

In addition, the TFTP Server service will log a short message, with the date and time, every time the service is started or stopped.

Known Problems

TFTP Server may fail to transmit or receive a file on a multi-homed server. If your server contains one network adapter which uses two or more IP addresses, try using the default IP address for TFTP transfers. This problem will be fixed in a future revision of TFTP Server.

The Author

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Your comments and suggestions are welcomed.