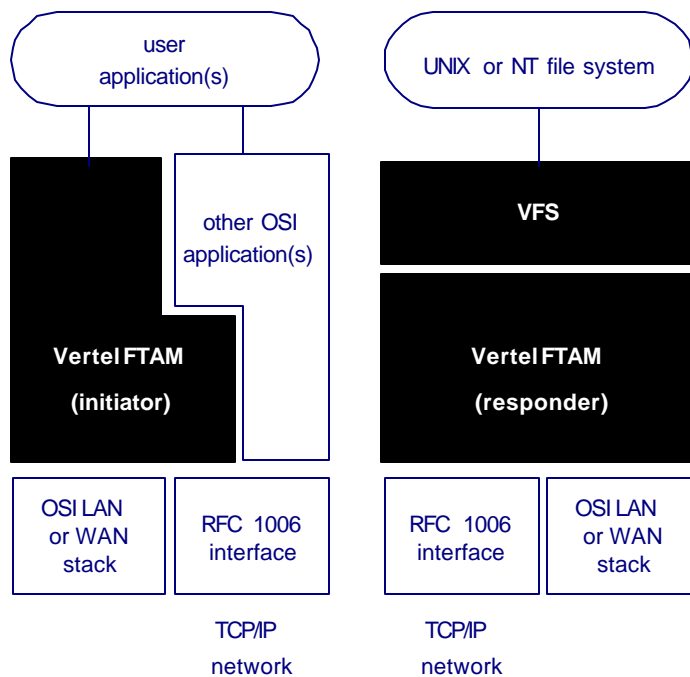


## Technical Overview UTS-FTAM

UTS-FTAM is an important component in the UTS solutions of Vertel's M\*Ware TMN portfolio. UTS- FTAM allows you to access and transfer files between your local operating system and any other system supporting OSI FTAM.

Its error recovery protocol machine (ERPM) component provides the ability to recover /restart failed file transfers from a negotiated point without the need to restart the transfer from the beginning.



FT-825 requires UTS- FTAM; it cannot be used separately from UTS- FTAM.

The UTS-FTAM product is made up of two main components that cooperate in managing files:

- A set of initiator utilities allow users to list, copy, move, or delete files that are stored on a filestore.
- A filestore (also called a responder) stores a collection of files. The filestore responds to requests from the initiator utilities.

Communication services between the initiator and responder may be provided by Vertel UTS OSI or TCP/IP transport components or by another vendor's conformant transport components.

Two OSI stack configurations are available:

- The TLI stack, for Solaris platforms
- The XTI stack, for HP-UX platforms.

The UTS-FTAM product provides all stack components above the transport layer.

## UTS-FTAM Overview

UTS-FTAM is an implementation of the ISO protocol standard for file transfer, access, and management (FTAM). This standard establishes the conventions by which files, and the information necessary to describe them, are to be used during OSI-conformant network communications. This standardization allows a user to manipulate files on remote computer systems by creating a virtual filestore with standardized information that describes the actual files stored in the operating system's file system. For each actual file on the responder system, the virtual filestore has descriptive information in FTAM standardized format. This descriptive information includes, among other file attributes, who is allowed to access or manipulate each file.

When a user at an FTAM initiator system uses FTAM to request access to a file, the information about the request is translated into the standardized FTAM format and then communicated to the FTAM filestore, which searches its information for the virtual file. UTS-FTAM checks that the user has privileges to access the file, and, if so, the filestore accesses the actual file in the UNIX file system, and completes the user's request.

## UTS-FTAM Components

UTS-FTAM main product components are listed below:

The UTS-FTAM product includes both an initiator FTAM protocol machine and a responder FTAM protocol machine that allow certain files on remote or local systems to be listed (directory-format files), copied, moved, and deleted. The files are categorized into FTAM document file types, which are described on the Interface Document File Types Section.

- The UTS-FTAM initiator FTAM protocol machine supports the set of four user utilities (fcp, fls, fmv, frm) that allow users to copy, list, move, and remove files.
- The UTS-FTAM responder FTAM protocol machine creates, organizes, and controls the virtual filestore, and communicates with the actual UNIX file system.
- An initiator and responder ERPM protocol machine. The ERPM uses the file services provided by the FTAM protocol machines and creates a new layer between the initiator utilities or the responder, and their FTAM protocol machines. This layer is responsible for handling errors.

The UTS-FTAM product also includes support files for configuring the product, its components, and its utilities.

## What is the ERPM Component?

The product's ERPM component implements the ISO protocol standard for the error recovery protocol machine (ERPM) in FTAM. When UTS-FTAM is used over an unreliable network, or used to transfer files to or from an unreliable system, a number of errors can occur. These errors can include:

- Errors while reading or writing data (without losing the association).
- Files being destroyed.

The ERPM establishes the conventions by which such errors in a file transfer can be recovered/restarted from a negotiated point. When a negotiated point is used, the transfer does not have to be restarted from the beginning.

Both the initiator of the file transfer utilities and the responder maintain information about each current file transfer so that in the event of an error during transfer, this information can be used to recover from the error. These pieces of information are called docketets.

## OSI Protocols and Services

In addition to FTAM, three other OSI protocols are included as part of the UTS-FTAM product: association control service element (ACSE), presentation, and session.

- ACSE establishes and maintains a virtual connection with a remote system, either the initiator or responder.
- Presentation provides for the representation of information that is communicated to or referred to by application processes.
- Session provides a means by which the dialogue between application processes is organized and synchronized. It manages the data between application processes.

UTS-FTAM, when running on an OSI stack, uses these protocols to communicate between the UTS-FTAM protocol machine and the transport service provider.

## Required OSI Services

UTS-FTAM requires a transport provider to transport its data to the remote system over the network media. The transport service is not provided as part of the UTS-FTAM product. For information on available LAN, WAN and TCP (RFC 1006) transports please refer to the UTS-NetLink datasheet.

## Interface to Vertel Stack Products

UTS-FTAM uses its own ACSE, presentation, and session protocol services to communicate over TL1 and XTI transport interfaces. Communication passes from the UTS-FTAM protocol machines to the ACSE, presentation, and session modules to the TLI and on to the transport provider.

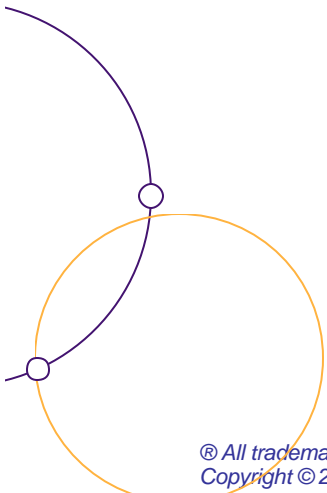
## Destination Attributes

When you copy or move a file to a filestore, the destination file is created with a set of FTAM file attributes. Depending on the situation, some of these file attributes may be derived from the source file, from default values, or from values specified in the product's utility configuration file, .ftlnit. For attributes that are not set by the .ftlnit configuration file, the UTS- FTAM product provides documentation of how the destination file attributes may be determined when users use fcp or fmv to copy or move a file to an FTAM filestore.

## UTS-FTAM Document File Types

Users can copy, list, move, and delete four types of files with the UTS-FTAM product. UTS- FTAM converts these document file types into text and binary files formatted for the operating system.

The following table also describes a fifth file type, the NBS-9 directory type, but the only action you can perform on NBS-9 files is to list them.



FILE TYPE	DATA TYPE	DESCRIPTION
FTAM-1	Unstructured text	<p>A file of this type contains a number of lines of text. Each line of text cannot exceed 134 characters and must be terminated with a &lt;CR&gt;&lt;LF&gt; pair. This file type may be extended.</p> <p>A file of this type consists of a single, undifferentiated series of text characters. This file type may only be read or written as a whole, since there are no subdivisions of the file contents.</p> <p>When you transfer a file of this type, UTS-FTAM automatically converts the format characters and delimiters (line feeds and carriage returns) between the format used with the UNIX operating system and standard FTAM format.</p>
FTAM-2	Structured text	<p>A file of this type contains lines of text. Each line cannot exceed 134 characters in length. Each line of text is independently addressable by record number. The file may be read by record number or read or written as a whole. This file may be extended.</p> <p>When you transfer a file of this type, UTS-FTAM automatically converts the format characters and delimiters (line feeds and carriage returns) between the line-differentiated format used with the UNIX operating system and standard FTAM format.</p>
FTAM-3	Simple binary	<p>A file of this type contains a string of bytes. Each string must be less than or equal to 512 bytes long. This file may only be read or written as a whole, since there are no subdivisions of the file contents.</p> <p>When you transfer a file of this type, UTS-FTAM does not convert its contents.</p>
NBS-9	Directory	<p>A file of this type contains a number of directory entries. Each directory entry contains a list of file attributes (such as the size of file, the date on which it was created, etc.). Under the UNIX operating system, directories are interpreted as files of this type. This file may only be read as a whole.</p> <p>UTS-FTAM can list the contents of an NBS-9 file with the <i>fls</i> utility.</p>
NBS-10	Random binary	<p>A file of this type contains a string of bytes. Each string of bytes may be independently addressed by byte offset and length. This file may be read as an FTAM-3 file. This file may be read or written as a whole or by byte offset and length.</p>

## *About Vertel*

Vertel is a leading provider of convergent service management mediation solutions.

Since 1995, Vertel has provided network management, mediation and integration solutions to both telecom infrastructure vendors and service providers such as Alcatel, Nokia, Motorola, Lucent, Nortel, NTT, Samsung, AT&T, BT, Deutsche Telekom, Cingular and Williams Communications.

Vertel's in-depth knowledge and commitment to industry standards, combined with experience of working with many different equipment types, creates high performance solutions that enable customers to quickly cross technological barriers. Vertel's mission is to make its customers successful by enabling them to reduce operational costs and introduce new services, networks and OSSs while leveraging existing investments.

Vertel's core product offering, M\*Ware, allows seamless management in multi-technology and multi-vendor environments. M\*Ware offers a full suite of mediation based applications that can address protocol translation, data transformation, element and network management, OSS application integration, and OSS exchange services. M\*Ware components are highly scalable and are very suited for mission critical operational environments. Vertel's Professional Services organization develops customized communications software solutions tailored to individual customer requirements, and also offers project management, systems analysis and other technical services.

Vertel is based in Woodland Hills, California and has sales offices throughout the world.

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