

INTEGRITY



APPL

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Networking Applications

Telnet, Shell and DNS

Interpeak Networking Applications is a collection of five fundamental networking modules: Telnet, Shell, DNS, FTP and TFTP. All of them support both IPv4 and IPv6, and will provide a powerful networking platform, explicitly designed for embedded systems.

The Interpeak Applications bundle contains five of the most basic networking applications that are required in an embedded system: Telnet, Shell, DNS, FTP and TFTP. All applications are designed for both IPv4 and IPv6 operation, and are optimized for deployment in embedded systems. Furthermore, they are delivered in ANSI compliant C source code, with ready-to-run RTOS integration containing makefiles etc.

Telnet is one of the most popular ways to perform login to a remote system over a network. A Telnet client is delivered with almost all desktop operating systems, enabling simple control and monitoring of embedded systems equipped with a Telnet server. The Telnet client and server communicate by means of a TCP connection, and use option negotiation to determine what features each end can provide.

The Interpeak Telnet server is a compact and standards-compliant implementation of the Telnet protocol, specifically designed for embedded systems. It can easily be combined with the Interpeak Shell, providing a powerful remote login facility.

Shell is usually defined as the command interpreter a user encounters when logging in to a desktop system. With the introduction of networking in embedded systems, a login facility with a command interpreter has become a desired feature also in such systems.

The Interpeak Shell is a command interpreter that provides the basic functionality of a login shell. It is compact and thus suitable for deployment in embedded systems with limited memory. The shell contains basic file system commands such as *cat*, *cd*, *cp*, *ls*, *mkdir*, *pwd*, *rm* and *rmdir*. The timing subsystem may also be controlled with the *date* and *time* commands. Furthermore, the shell command set may be extended at run-time with user-implemented commands.

DNS is a service that maps symbolical computer names to IP addresses. This means that a system doesn't have to know the IP addresses of all peer systems in advance;

it can ask a DNS server for that information.

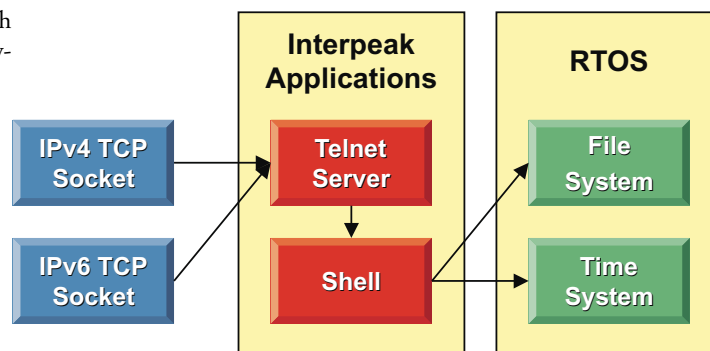
The Interpeak DNS client supports both IPv4 and IPv6 addresses. It also provides reentrant IPv6 versions of the *gethostbyname()* and *gethostbyaddr()* functions as defined in RFC2553. The new reentrant functions are named *getipnodebyname()* and *getipnodebyaddr()* respectively.

The DNS client also contains the *nslookup* utility program, which may be used to obtain information from name servers. This utility may also be integrated into the Interpeak Shell.

Supported Standards

The DNS client supports the following RFCs:

- RFC1034—Domain Names, Concepts and Facilities
- RFC1035—Domain Names, Implementation and Specification.
- RFC1886—DNS Extensions to support IP version 6
- RFC2553—Basic Socket Interface Extensions for IPv6



The Interpeak Shell and Telnet Server may be combined to form a powerful remote login facility.

FTP and TFTP

FTP remains one of the most widely used protocols to transfer files across the Internet. Most Internet hosts contain FTP software by default, enabling file transfer to be performed in a uniform way.

The protocol operates between two hosts, a client and a server. The server defines a set of commands that are available to the client. A client may e.g. login to the server, create and inspect directories, change directory, check server status and finally send and receive files.

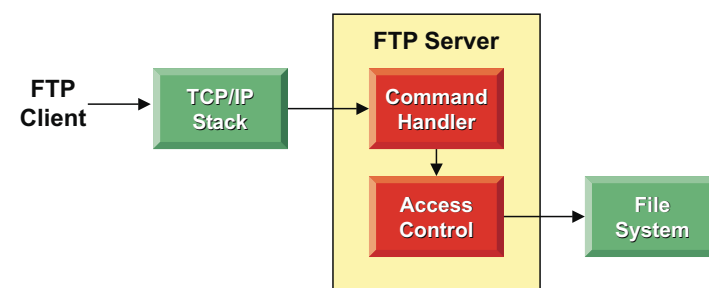
IPv6 Capability

Both the Interpeak FTP client and server support the extended command set that is required for IPv6 operation. The client can also be configured to use the extended commands for IPv4 connections.

The server does by default provide two sockets, one for IPv4 and one for IPv6. The IPv6 support is however configurable, and can be removed for IPv4-only environments.

Dual Client Interfaces

The Interpeak FTP client can be accessed in two ways—via a C language API and via a command-line interface.



The architecture of the Interpeak FTP server.

This means that a customer application can select to use only the API, and include customized FTP functionality in proprietary software.

The command-line interface coexists with the API—it is actually using the API—which means that both interfaces can be used in the same application.

IETF Standards Compliance

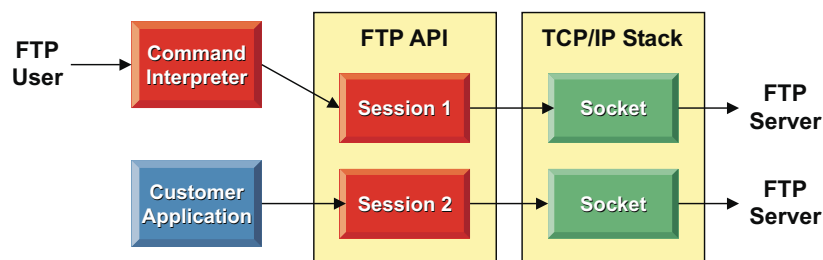
The FTP client and server support the following RFCs:

- RFC959—FTP
- RFC1123—Internet Hosts
- RFC2428—IPv6 Extensions
- RFC2577—Security

TFTP is a file transfer protocol like FTP, but was designed to be used when bootstrapping diskless systems. Since both the bootstrapping software and a protocol stack must fit in read-only memory on such systems, TFTP only provides basic file transfer functionality. Another optimization is that UDP is used instead of TCP to minimize the code size of the protocol stack.

TFTP is also useful in other situations where code memory is a limited resource, e.g. when distributing configuration data to embedded systems.

Interpeak TFTP contains both client and server modules. It supports RFC 1350, and is of course capable to handle both the IPv4 and the IPv6 protocol. The TFTP client provides the same kind of dual interface as the FTP client, i.e. a command-line interface and a C language API. Both interfaces can be used simultaneously.



The Interpeak FTP Client can be accessed in two ways, through a BSD command-line interface and through a C-language API.



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Interpeak Network Security

Interpeak AB, located in Stockholm, Sweden, specializes in network security software and new Internet communication protocols for embedded systems. Interpeak products include IPSec, IKE, SSH, SSL, Web Server Security and NAT. Internet protocols such as LDAP, L2TP, RADIUS, and PPPoE, as well as a dual-mode IPv4/IPv6 TCP/IP stack is also available. For additional information, please visit our homepage: www.interpeak.se, or send a mail to info@interpeak.se.

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