



Chapter 1

TALnet Product Overview

TAL products provide high-speed wireless internetworking using spread-spectrum packet radio technology. Using TAL wireless routing technology, you can create full-mesh, partial-mesh, or hierarchical internetworks that connect stationary systems on a peer-to-peer basis to other stationary systems or to a central point of presence (POP).

TALnet is the operating system software that is preloaded into nonvolatile solid-state memory on the SubSpace 2001 router subsystem. The TALnet software incorporates networking protocols and applications from the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite with TALtalk, a proprietary link-layer protocol that provides efficient multiple access to wireless media by controlling operational radio parameters. This chapter describes the TALtalk protocol and the standard networking protocols and applications, and provides a brief overview of how to configure the TALnet software.

1.1 TALtalk Protocol

Wireless networks encounter conditions that do not affect wired networks. For example, wireless networks must contend with interference from other sources of electromagnetic radiation, multipath conditions, and changing link status. The TALtalk protocol resolves these by incorporating the following functionality:

- Minimizes collisions of data packets sent by different nodes on a network—Standard collision-detection methods in wire-based environments require physical connections. Therefore, the TALtalk protocol incorporates its own collision-detection method for wireless environments.
- Provides reliable data transfers—Because wireless environments generally have higher transmission error rates than wired environments, the TALnet software includes the means for ensuring reliable data transfers in a wireless environment.
- Allows for software control of the following radio parameters:
 - Frequency channel selection (assists in avoiding interference)
 - Transmission power level (allows you to control the distance that radio signals travel)
 - PN code used by spread-spectrum transceivers (increases throughput by allowing more efficient use of channels)

1.2 Standard Network Protocols

TALnet software incorporates the following standard protocols from the TCP/IP suite:

- Internet Protocol (IP)
- Transmission Control Protocol (TCP)
- User Datagram Protocol (UDP)
- Internet Control Message Protocol (ICMP)
- Address Resolution Protocol (ARP)
- Reverse Address Resolution Protocol (RARP)
- Point-to-Point Protocol (PPP) with Van Jacobson header compression
- Routing Information Protocol Versions 1 and 2 (RIP-1 and RIP-2)
- Packet filtering on the source address, destination address, protocol, source port, and destination port

1.3 Standard Application Support

TALnet software supports the following standard applications:

- Domain Name System (DNS) resolver
- Simple Network Management Protocol, Version 1 (SNMPv1)—Including the standard Management Information Base-II (MIB-II) and a proprietary TAL MIB
- File Transfer Protocol (FTP)
- Telnet
- Traceroute
- Ping
- Echo server
- Discard server
- Full packet tracing and decoding

1.4 Configuring the TALnet Software

After you install your SubSpace 2001 Wireless Router, you must configure the TALnet software. The following is the general process for configuring your TALnet software. Refer to the specified chapters in this document for instructions and guidelines on each step.

- 1 Fill out a checklist that identifies required configuration information such as the addressing scheme, hostname, and subnet mask of your network. Include radio parameters from the link analysis you performed during the hardware installation process. *Chapter 2.*
- 2 Log onto the system and open the configuration file. You can do this remotely or you can use the service console that is directly attached to the router. *Chapter 3.*

3 Modify the configuration file as needed:

- Specify the hostname, system IP address, system contact, and system location.
- Configure radio parameters.
- Create and configure your Ethernet device and interface.
- Specify the address of a server that provides DNS support.
- Set up routing by configuring dynamic routing or defining a default route for static routing.
- Specify users and authorization levels.
- Establish IP packet filters.
- Modify the ARP table.
- Configure support for PPP connections.

Chapter 3.

4 Load and execute the new configuration file. *Chapter 3.*

5 Monitor the network. *Chapter 4.*

Refer to the *SubSpace 2001 Installation Guide* for information on installing your Wireless Router.

