Technical Summary of the SWAP Specification

Introduction

The HomeRF Shared Wireless Access Protocol (SWAP) system is designed to carry both voice and data traffic and to interoperate with the Public Switched Telephone Network (PSTN) and the Internet; it operates in the 2400MHz band and uses a digital frequency hopping spread spectrum radio. The SWAP technology was derived from extensions of existing cordless telephone (Digital Enhanced Cordless Telephone or DECT) and wireless LAN technology to enable a new class of home cordless services. It supports both a TDMA (Time Division Multiple Access) service to provide delivery of interactive voice and other time-critical services, and a CSMA/CA (Carrier Sense Multiple Access/Collision Avoidance) service for delivery of high speed packet data.

Main System Parameters

- Frequency hopping network: 50 hops/second
- Frequency range: 2400MHz ISM band
- Transmission power: 100mW
- Data Rate:
- Range:
- Supported stations: Up to 127 devices per network
- Voice connections: Up to 6 full duplex conversations
- Data security: Blowfish encryption algorithm (over 1 trillion codes)
- Data compression: LZRW3-A algorithm
- 48-bit Network ID: Enables concurrent operation of multiple co-located networks.

Mbps using 2FSK modulation
Mbps using 4FSK modulation
Covers typical home and yard

Network Topology

The SWAP system can operate either as an ad-hoc network or as a managed network under the control of a Connection Point. In an ad-hoc network, where only data communication is supported, all stations are equal and control of the network is distributed between the stations. For time critical communications such as interactive voice, a Connection Point is required to coordinate the system. The Connection Point, which provides the gateway to the PSTN, can be connected to a PC via a standard interface such as USB that will enable enhanced voice and data services. The SWAP system also can use the Connection Point to support power management for prolonged battery life by scheduling device wakeup and polling.

The network can accommodate a maximum of 127 nodes. These nodes can be a mixture of these 4 basic types:

- Connection Point that supports voice and data services.
- Voice Terminal that only uses the TDMA service to communicate with a base station.
- Data Node that uses the CSMA/CA service to communicate with a base station and other data nodes.
- Voice and Data Node which can use both types of services