



Workgroup Bridge Overview

This chapter provides an overview of the workgroup bridge and how it operates in a wireless infrastructure.

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Overview

The Cisco Aironet Workgroup Bridge (hereafter referred to as the *bridge*) is a small, stand-alone unit that provides a wireless infrastructure connection for Ethernet-enabled devices. Figure 1 on page 1-5 shows a typical network configuration. A device connected to a bridge communicates with a network infrastructure through a Cisco Aironet Access Point (hereafter referred to as an *access point*). The bridge connects to a device through a standard Ethernet port using a 10BASE-T/RJ-45 (twisted pair) connector. The bridge provides wireless LAN connections for up to eight devices connected to a hub through an Ethernet cable.

**Note**

Cisco Aironet workgroup bridges associate only to Cisco Aironet access points and bridges. The bridge is not Wi-Fi certified and does not interoperate with non-Cisco Aironet wireless devices.

Data Transparency and Protocols

The bridge transports data packets transparently as they move through the wireless infrastructure.

The bridge is also protocol-independent for all packets except those addressed specifically to the bridge or sent as multicast address packets. Depending on the address, packets are processed as follows:

- Packets addressed specifically to the bridge are examined based on the protocol header. If the protocol is recognized, the packet is processed.
- Multicast address packets are also examined based on the protocol header and are processed whether the protocol is recognized or not. If protocol filtering is enabled, then the appropriate parts of the packet are examined.
- All other packets are processed without an examination of the contents of the packet and without regard to the protocol used.

Ethernet Compatibility and Protocols Supported

The bridge attaches directly to a 10BASE-T (twisted pair) Ethernet LAN segment. This segment must conform to IEEE 802.3 or Ethernet Blue Book specifications.

The bridge supports the following protocols:

- TCP/IP
- SNMP: the resident agent is compliant with the MIB-I and MIB-II standards, TCP/IP-based networks, as well as a custom MIB for specialized control of the system.

Radio Characteristics

The bridge uses Direct Sequence Spread Spectrum (DSSS) transmission. It combines high data throughput with excellent immunity to interference. The bridge operates in the 2.4-GHz license-free Industrial Scientific and Medical (ISM) band and transmits over a half-duplex radio channel operating at up to 11 megabits per second (Mbps).

Radio Ranges

Because the bridge is a radio device, it is susceptible to common causes of interference that can reduce throughput and range. Follow these guidelines to ensure the best possible performance:

- Install the bridge in an area where large steel structures such as shelving units, bookcases, and filing cabinets will not obstruct radio signals to and from the bridge.
- Install the bridge away from microwave ovens. Microwave ovens operate on the same frequency as the bridge and can cause signal interference.
- Clear or open areas provide better radio range than closed or filled areas. Also, the less cluttered the work environment, the greater the range.

Radio Antenna

The bridge comes with two possible antenna configurations: one captured antenna or two reverse-TNC antenna connectors to which the user can attach one or two antennas.

Security Features

The bridge offers the following security features:

- DSSS technology, previously developed for military “anti-jamming” and “low probability of intercept” radio systems.
- Wired Equivalent Privacy (WEP), an IEEE 802.11 feature that provides data confidentiality equivalent to a wired LAN without crypto techniques.
- A service set identifier (SSID) that must match the SSID used by the parent access point.
- The ability to set passwords and privilege levels.

Terminology

In describing wireless LANs and LAN components, Cisco Aironet uses the following terminology:

Association—each root unit or repeater (defined later in this section) in the infrastructure contains an association table that controls the routing of packets between the access point and the wireless infrastructure. The association table maintains entries for all the nodes situated below the access point on the infrastructure including repeaters and client nodes.

Cell—the area of radio range or coverage in which the bridge can communicate with the access point. The size of a single cell depends upon the speed of the transmission, the type of antenna used, and the physical environment as well as other factors.

End node—a client device such as a workstation or laptop computer that has a wired Ethernet connection to the bridge through a hub.

Infrastructure—the communications system that combines access points, bridges, mobile nodes and fixed nodes. Access points within the infrastructure can be root units, which are physically wired to the LAN backbone, or they can act as wireless repeaters (defined later in this section). Other wireless devices serve as fixed nodes or mobile nodes.

Parent/child node—refers to the relationships between nodes in the wireless infrastructure. The complete set of relationships is sometimes described as a network tree. For example, the access point (at the top of the tree) is the parent of the end nodes, and the end nodes are the children of the access point.

Repeater—an access point that extends the radio range of the infrastructure. A repeater is not physically attached to the wired LAN but communicates by radio to another access point, which is either a root unit or another repeater.

Root unit—a point that is located at the top, or starting point, of a wireless infrastructure. A root unit provides the physical connection to the wired LAN and contains configuration information in its association table that covers all nodes that access the wired infrastructure. All access points directly attached to the wired LAN backbone are root units.

Bridge Configuration

Figure 1-1 shows a typical configuration for a wireless LAN that incorporates a bridge.

Figure 1-1 Workgroup Bridge Connected to a LAN

