The Aperto PacketWave 600 Series provides economical, high efficient wireless bridging for a wide array of networking applications.

Features

Delivers data rates up to 20 Mbps per 6 MHz channel; 12 Mbps net throughput

Range extends up to 62 miles (100 km) in 2.5 GHz, 40 miles (64 km) in 3.3 or 3.5 GHz, and 35 miles (56 km) in 5.3 or 5.8 GHz

Narrow channel widths (2 to 6 MHz) enable highly efficient division of the channel band—up to 12 times more efficient for backhauling to T1 lines than competing products

Automatic Frequency Selection (AFS) switches pre-selected channels dynamically when error rates are high

QoS capabilities prioritize time-sensitive voice and data traffic

Rate limiting between wireless links and points of presence helps alleviate bandwidth contention problems

Synchronization between units supports hub-site co-location of links and contiguous channels

Connectorized output enables optional high-gain antennas

PacketWave® 600 Series

Wireless Bridges

2.5 GHz, 3.3 GHz, 3.5 GHz, 5.3 GHz, 5.8 GHz

Aperto® Networks PacketWave® 600 Series wireless bridges provide economical, high-speed IP connections between locations up to 62 miles (100 km) apart, with unparalleled interference resilience and highly efficient spectrum usage.

The bridges enable a wide range of applications that include high-bandwidth backhaul from Wi-Fi™ hot spots to the Internet and WANs. They also offer a higher-capacity, lower-cost alternative to T1/E1 connections from one building to another in an enterprise environment. And they support backhaul of IP-based third-generation Universal Mobile Telecommunications System (UMTS) networks.

PacketWave wireless bridges deliver 20 non-overlapping 6 MHz channels in the 5.8 GHz ISM band—more than five times the number of channels offered by competitors.

Interference Resilience

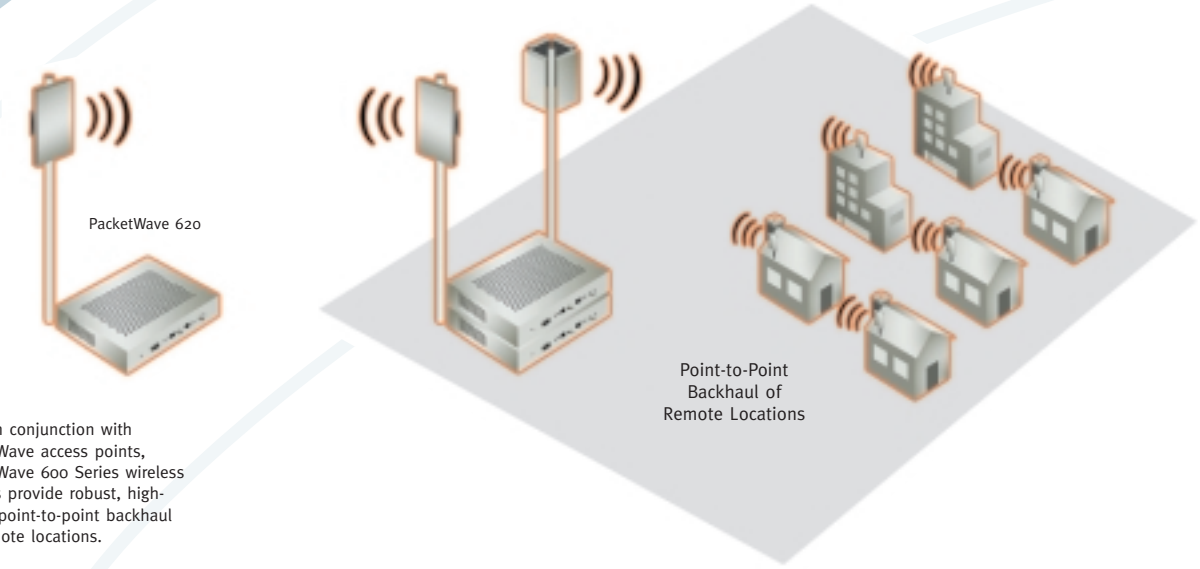
PacketWave wireless bridges provide highly effective interference immunity using Aperto's OptimaLink® technology. OptimaLink dynamically changes several PHY and MAC parameters on a burst-by-burst basis. This provides a spectrally efficient link that is robust enough to handle a wide variety of interference conditions.

Adaptive parameters include:

- Modulation
- ARQ (Automatic Re-transmissions)
- Payload size
- FEC (Forward Error Correction)

Co-location and Antenna Options

A synchronization option provides the ability to implement up to 32 wireless bridge units at the same location. Multiple units can be configured on adjacent channels with no frequency separation requirements. In addition, external antenna connectors provide the flexibility to use various antennas to address diverse range requirements.



Used in conjunction with PacketWave access points, PacketWave 600 Series wireless bridges provide robust, high-speed point-to-point backhaul for remote locations.

Narrow Channels

PacketWave 600 bridges deliver excellent spectral efficiency and service-offering scalability. Aperto bridges are 12 times more efficient than competing products when used to backhaul T1/E1-size data pipes, accommodating channel sizes down to 2 MHz (compared to 25 MHz for competitors). With PacketWave 600 bridges, providers can divide crowded unlicensed spectrum into 62 unique channels without sacrificing service quality. In the licensed spectrum, this efficient channel division yields more profitability per hertz.

Besides optimizing overall band usage, the bridges let providers make more efficient use of single channels by conserving bandwidth. The narrow channel widths also improve link margins—the ability of the signal to tolerate path interference from environmental conditions such as multipath fading.

Traffic Prioritization

Aperto bridges provide 802.16 standard QoS capabilities that allow providers to give priority to time-sensitive applications such as voice and video traffic. They can also accommodate any virtual LAN (VLAN) priority scheme. These QoS capabilities help avoid contention and keeps service quality high. Conventional data traffic can use the entire wireless band when no high-priority traffic is traversing the link.

Traffic may be prioritized according to:

- IP address
- MAC address
- VLAN ID range
- Type of Service (i.e., low-latency bit set)

Rating Limiting

When multiple wireless links converge at one point of presence (PoP), the total wireless bandwidth may exceed the bandwidth capacity of the PoP's terrestrial link. PacketWave bridges can limit the data rate of each wireless link according to the individual service offering. This distributes capacity evenly among wireless customers, helping to resolve contention issues.

PacketWave 600 Series Wireless Bridge Specifications

Interfaces

10/100 Ethernet: RJ-45 connector
IF Port: F connector
    Cable length: up to 164 feet (50 meters); up to 328 feet (100 meters) with high-quality cable
Radio Control Port: RJ-45 connector
    Cable length up to 328 feet (100 meters)
BNC Synchronization Port: up to 64 units

Radio Frequency

Data Rates: 20 Mbps per 6 MHz radio channel, 12 Mbps net throughput
Modulation: QPSK, 16 QAM
Duplexing: TDD
Receive Sensitivity: -82 dBm (16 QAM), -88 dBm (QPSK)
Automatic Frequency Selection

Frequency Band	Max TX Power*	Channel Sizes
2.5-2.686 GHz	23 dBm	2, 3, 4, 5, 6 MHz
3.3-3.4 or 3.4-3.7 GHz	20 dBm	ETSI: 1.75, 3.5, 7 MHz; Others: 2, 3, 4, 5, 6 MHz
5.250-5.350 or 5.725-5.925 GHz	20 dBm	2, 3, 4, 5, 6 MHz

*Depends on country regulatory requirements

Antennas

Antenna	Gain (dBi)	16QAM Range* Miles, (km)	QPSK Range* Miles, (km)	Beamwidth Az and El	Size	Mounting Pipe Diameter inches (cm)	Windloading 125 mph (200 km/hr) Front/Side lbs. (kg)
PPA2500-24	24.3	31.2 (50.2)	42.1 (67.8)	9.5°, 9.5°	3 ft.(90 cm) dish	2.0–4.5 (5.1–11.4)	492/40 (223/18)
PPA3300-24	24.2	24.1 (38.8)	32.6 (52.4)	10°, 10°	2 ft.(60 cm) dish	2.0–4.5 (5.1–11.4)	222/14 (100/6.4)
PPA3500-24	24.2	24.1 (38.8)	32.6 (52.4)	10°, 10°	2 ft.(60 cm) dish	2.0–4.5 (5.1–11.4)	222/14 (100/6.4)
PPA5300-28	29.0	26.6 (42.8)	35.5 (57.7)	9°, 9°	2 ft.(60 cm) dish	2.0–4.5 (5.1–11.4)	222/14 (100/6.4)
PPA5800-23	23.0	15.3 (24.6)	20.6 (33.2)	9°, 9°	1 ft.(30.5 cm) square	1.75–3 (4.45–7.62)	103/13.2 (47/6)
PPA5800-29	29.0	26.6 (42.8)	35.5 (57.7)	9°, 9°	2 ft.(60 cm) dish	2.0–4.5 (5.1–11.4)	222/14 (100/6.4)

*Line-of-sight depends on regulatory power limits. Other antenna options are available.

Networking and Management

Bridge Architecture
SNMP; Web-Based Graphical Interface
Downloadable Code Updates and Configuration Changes
Java-Based Installation Manager and Antenna Pointing Tool

PacketWave 600 Series Wireless Bridge Specifications (cont.)

Indoor Unit (IDU)

Temperature Range: 0° to 40° C

Humidity: 10%–90% noncondensing

Power Requirements: 100-240 VAC; 47-63 Hz; 30 watts

Outdoor Unit (ODU)

Temperature Range: -35° to 60° C

Humidity: 10%–90% noncondensing

Mounting: 1.5 inches (3.8 cm) or 2.0 inches (5.1 cm) pole diameter

Wind Speed: 75 mph operation (120 km/hr); 125 mph survival (200 km/hr)

Unit	Size WxHxD inches (cm)	Weight lbs. (kg)	Certifications
2.5 GHz Radio	13.4 x 13.4 x 1.9 (33 x 33 x 4.8)	7.5 (3.4)	FCC Part 21
3.3 or 3.5 GHz Radio	11.8 x 11.8 x 1.9 (30 x 30 x 4.8)	7.0 (3.2)	EN 301 753, EN 301 021
5.3 or 5.8 GHz Radio	8.1 x 8.1 x 1.9 (20.5 x 20.5 x 2.8)	4.4 (2.0)	FCC 15.247
IDU	1.5 x 6.6 x 9.1 (3.8 x 16.8 x 23.1)	2.2 (1.0)	FCC Class B, CE, EN

Ordering Information

PacketWave 600 Bridge Pair

PacketWave 2.5 GHz

PW600S-25-01 2.5 GHz radios with N connectors, sync port

PW601S-25-01 2.5 GHz radios with 24.3 dBi antennas, sync port

PacketWave 3.3 GHz

PW600S-33-01 3.3 GHz radios with N connectors, sync port

PW601S-33-01 3.3 GHz radios with 24.2 dBi antennas, sync port

PacketWave 3.5 GHz

PW600S-35-01 3.5 GHz radios with N connectors, sync port

PW601S-35-01 3.5 GHz radios with 24.2 dBi antennas, sync port

PacketWave 5.3 GHz

PW600S-53-01 5.3 GHz radios with N connectors, sync port

PW601S-53-01 5.3 GHz radios with 23 dBi antennas, sync port

PW602S-53-01 5.3 GHz radios with 29 dBi antennas, sync port

PacketWave 5.8 GHz

PW600S-58-01 5.8 GHz radios with N connectors, sync port

PW601S-58-01 5.8 GHz radios with 23 dBi antennas, sync port

PW602S-58-01 5.8 GHz radios with 29 dBi antennas, sync port

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