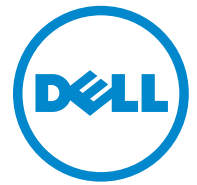


Dell Networking W-Series 228 access points



802.11ac for harsh, weather-protected areas

Rugged Dell Networking W-Series 228 wireless APs (W-AP228 and W-IAP228) deliver gigabit Wi-Fi performance to 802.11ac mobile devices in harsh, weather-protected environments such as warehouses, industrial freezers or stadium enclosures.

With a maximum data rate of 1.3Gbps in the 5GHz band and 600Mbps in the 2.4GHz band, the 228 APs are three times faster than 802.11n APs and provide performance similar to a wired connection.

The 228 APs include ClientMatch™ technology, which eliminates sticky clients by continuously gathering session performance metrics from mobile devices. This information is then used to steer each mobile device to the best AP and radio on the WLAN.

Proactive and deterministic, ClientMatch dynamically optimizes Wi-Fi client performance as users roam and RF conditions change. If a mobile device moves out of range or an AP or RF interference impedes performance, ClientMatch automatically steers it to a better AP.

With ClientMatch, 228 APs load web content faster, deliver video streams with improved quality and support high densities of mobile devices. An 802.11ac network without ClientMatch performs no differently than an 802.11n WLAN.

Dell Networking W-Series APs support priority handling and policy enforcement for unified communication apps, including Microsoft Lync with encrypted videoconferencing, voice, chat and desktop sharing.

Unique benefits

- Industrial design for harsh, weather-protected environments
 - Extends temperature range for indoor environments that lack heating and cooling
 - Sealed connector interfaces lock out dust and moisture
 - Connectorized antenna ports support high gain large public venue antennas
 - Designed for enhanced physical security
- Delivers 1.9Gbps aggregate throughput
 - EtherChannel link aggregation on two Gigabit Ethernet ports provides up to 1.9Gbps throughput
- Supports aggregate data rates up to 1.9Gbps
 - 802.11ac transmit beam-forming to enhance signal, throughput and multi stream operation
 - Supports 1.3Gbps rates in the 5GHz band for 802.11ac clients
 - Supports up to 600Mbps for TurboQAM-enabled mobile devices operating in the 2.4GHz band
- Best-in-class RF management
 - Integrated Adaptive Radio Management™ technology manages the 2.4GHz and 5GHz radio bands and ensures that APs stay clear of RF interference
- Spectrum analysis
 - Capable of part-time or dedicated air monitoring, the spectrum analyzer remotely scans the 2.4GHz and 5GHz radio bands to identify sources of RF interference



- Wireless mesh
 - Wireless mesh connections are convenient where Ethernet drops are not available
- Security
 - Integrated wireless intrusion protection offers threat protection and mitigation and eliminates the need for separate RF sensors and security appliances
 - With an OpenDNS service subscription, Dell Networking W-Series Instant APs deliver integrated web filtering, malware and botnet protection to every device connected to the WLAN
 - Encrypted IPsec VPN tunnels securely connect remote users to corporate network resources
 - Integrated Trusted Platform Module (TPM) for secure storage of credentials and keys
 - SecureJack-capable for tunneling of wired Ethernet traffic

Choose your operating mode

The 228 APs offer a choice of operating modes to meet your unique management and deployment requirements.

- Controller-managed AP or Remote AP (RAP): When managed by Dell Networking W-Series controllers running AOS, 228 APs offer centralized configuration, data encryption, policy enforcement and network services, as well as distributed and centralized traffic forwarding.
- Instant™ AP (IAP): A single IAP running InstantOS™. In Instant mode, a single AP automatically distributes the network configuration to other IAPs in the WLAN. Simply power-up an IAP, configure it over the air, and plug in the other IAPs – the entire process takes about five minutes.
- Spectrum analysis identifies sources of RF interference
- Air monitor (AM) provides wireless intrusion protection
- Hybrid AP serves Wi-Fi clients and provides wireless intrusion protection and spectrum analysis
- Secure enterprise mesh

If WLAN and network requirements change, a built-in migration path allows 228 Instant APs to become part of a WLAN that is centrally managed by a controller.

228 AP specifications

- 2.4GHz (600Mbps max) and 5GHz (1.3Gbps max) radios, each with complete 3x3 MIMO radio paths (combined and diplexed) with three separate external antenna connectors (total of 6 RP-SMA connectors)

Wireless radio specifications

- AP type: Indoor, dual radio, 5GHz 802.11ac and 2.4GHz 802.11n
 - In addition to 802.11n data rates, the 2.4GHz radio supports 802.11ac data rates using 256-QAM modulation. This gives TurboQAM-enabled clients a 33% boost above the maximum supported data rate.
- Software-configurable dual radio supports 5GHz and 2.4GHz
- 3x3 MIMO with three spatial streams and up to 1.3Gbps wireless data rate
- Supported frequency bands (country-specific restrictions apply):
 - 2.4000 to 2.4835GHz
 - 5.150GHz to 5.250GHz
 - 5.250GHz to 5.350GHz
 - 5.470GHz to 5.725GHz
 - 5.725GHz to 5.850GHz
- Available channels: Dependent upon configured regulatory domain
- Dynamic frequency selection (DFS) optimizes the use of available RF spectrum
- Supported radio technologies:
 - 802.11b: Direct-sequence spread-spectrum (DSSS)
 - 802.11a/g/n/ac: Orthogonal frequency-division multiplexing (OFDM)
 - 802.11n/ac: 3x3 MIMO with up to three spatial streams
- Supported modulation types:
 - 802.11b: BPSK, QPSK, CCK
 - 802.11a/g/n: BPSK, QPSK, 16-QAM, 64-QAM
 - 802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
- Transmit power: Configurable in increments of 0.5 dBm
- Maximum (aggregate, conducted total) transmit power (limited by local regulatory requirements):
 - 2.4GHz band: +23 dBm (23 dBm per chain)
 - 5GHz bands: +23 dBm (23 dBm per chain)
- Advanced cellular coexistence (ACC) feature to effectively deal with interference from cellular systems
- Maximum ratio combining (MRC) for improved receiver performance
- Cyclic delay diversity (CDD) for improved downlink RF performance
- Short guard interval for 20, 40 and 80MHz channels
- Space-time block coding (STBC) for increased range and improved reception
- Low-density parity check (LDPC) for high-efficiency error correction and increased throughput
- Transmit beam-forming (TxBF) for increased reliability in signal delivery
 - Supported data rates (Mbps):
 - 802.11b: 1, 2, 5.5, 11
 - 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54
 - 802.11n: 6.5 to 450 (MCS0 to MCS23)
 - 802.11ac: 6.5 to 1,300 (MCS0 to MCS9, NSS = 1 to 3)
 - 802.11n high-throughput (HT) support: HT 20/40
 - 802.11ac very high throughput (VHT) support: VHT 20/40/80
 - 802.11n/ac packet aggregation: A-MPDU, A-MSDU

Power

- Power over Ethernet (PoE+) only: 802.3at compliant
- Power sources sold separately
- Worst case power consumption: 23W

Antennas

- Optional external antennas: See Ordering information section

Other interfaces

- Six RP-SMA connectors for external antennas

Mounting

- Optional mounting kits:
 - AP-130-MNT or AP-220-MNT-W1 are directly compatible
 - 270 series outdoor AP mounts (AP-270-MNT-V1, AP-270-MNT-V2, AP-270-MNT-H1, AP-270-MNT-H2) are compatible when the AP-270-MNT-ADP adapter is utilized

Mechanical

- Dimensions/weight (unit, excluding mount accessories):
 - 222 mm (L) x 150 mm (W) x 75 mm (H), 8.5" (L) x 6" (W) x 2.5" (H)
 - 1.225 kg/2.700 lbs

Environmental

- Operating:
 - Temperature: -40° C to +60° C (-40° F to +140° F)
 - Humidity: 5% to 95% non-condensing
- Storage and transportation:
 - Temperature: -40° C to +70° C (-40° F to +158° F)
 - Operating Altitude: 3,000 m

Regulatory

- FCC/Industry of Canada
- CE Marked
- R&TTE Directive 1995/5/EC
- Low Voltage Directive 72/23/EEC
- EN 300 328
- EN 301 489
- EN 301 893
- UL/IEC/EN 60950
- EN 60601-1-1, EN60601-1-2

Contact your Dell sales representative for country-specific regulatory information.

Regulatory model numbers

- W-AP228 and W-IAP228: APIN0228

Certifications

- CB Scheme Safety, cTUVus
- UL2043 plenum rating
- Wi-Fi Alliance certified 802.11a/b/g/n/ac

Minimum operating AOS system software versions

- OS 6.4.3.0
- Instant 4.1.2.0

Warranty

- Limited lifetime warranty



RF performance table

	Maximum transmit power (dBm) per transmit chain	Receiver sensitivity (dBm) per receive chain
802.11b 2.4GHz		
1Mbps	23.0	-92.0
2Mbps	23.0	-92.0
5.5Mbps	23.0	-90.0
11Mbps	23.0	-88.0
802.11g 2.4 GHz and 802.11a 5 GHz		
6Mbps	23.0	-88.0
54Mbps	18.0	-75.0
802.11n HT20 2.4 GHz and 5 GHz		
MCS0/8	23.0	-88.0
MCS7/15	17.0	-71.0
802.11n HT40 2.4 GHz and 5 GHz		
MCS0/8	23.0	-85.0
MCS7/15	17.0	-68.0
802.11ac VHT20 5 GHz		
MCS0	23.0	-88.0
MCS9	16.0	-65.0
802.11ac VHT40 5 GHz		
MCS0	23.0	-85.0
MCS9	16.0	-62.0
802.11ac VHT80 5 GHz		
MCS0	23.0	-82.0
MCS9	16.0	-59.0

Maximum capability of the hardware provided. Maximum transmit power is limited by local regulatory settings.

Ordering information

Part number	Description
Access points	
W-AP228	Dell W-AP228 Temperature Hardened Wireless Access Point, 802.11ac, 3x3:3, dual radio, antenna connectors
W-IAP228-RW	Dell W-IAP228 Temperature Hardened Wireless Instant Access Point, 802.11ac, 3x3:3, dual radio, antenna connectors - Restricted regulatory domain: Rest of World
W-IAP228-US	Dell W-IAP228 Temperature Hardened Wireless Instant Access Point, 802.11ac, 3x3:3, dual radio, antenna connectors - Restricted regulatory domain: United States
W-IAP228-JP	Dell W-IAP228 Temperature Hardened Wireless Instant Access Point, 802.11ac, 3x3:3, dual radio, antenna connectors - Restricted regulatory domain: Japan
AP powering accessories	
PD-9001GR-AC	Indoor PoE midspan injector 10/100/1000 802.3at single port. Add country-specific AC power cord from the list below.
PD-9001GO-DC	1 Port 802.3at PoE Midspan 10/100/1000 802.3at Outdoor; 12-24V DC in 48V PoE out. Add country-specific AC power cord from the list below.
PD-9001GO-NA	1 Port 802.3at PoE Midspan 10/100/1000 802.3at Outdoor; NA power cord
PD-9001GO-INTL	1 Port 802.3at PoE Midspan 10/100/1000 802.3at Outdoor; EU/International power cord
PD-MOUNT-OD	Pole/Mast mount kit for outdoor PoE midspan injectors



Ordering information

Part number	Description		
Mounting accessories			
AP-130-MNT	AP Mount Kit (basic, flat surface). Color: Off white		
AP-220-MNT-W1	AP Mount Kit (basic, flat surface). Contains 1x flat surface wall/ceiling mount bracket. Color: Black		
AP-270-MNT-ADP	Adapter to allow 228 APs to use outdoor AP 270 series brackets		
AP-270-MNT-V1	Long Pole/Wall Mount for AP, 300 mm from vertical mounting asset		
AP-270-MNT-V2	Short Pole/Wall Mount for AP, 75 mm from vertical mounting asset		
AP-270-MNT-H1	AP Hanging Tilting Wall Mount Kit		
AP-270-MNT-H2	AP Horizontal or Vertical Flush Mount kit		
Power cords (optional)			
PC-AC-ARG	Argentina	PC-AC-JP	Japan
PC-AC-AUS	Australia	PC-AC-KOR	Korea
PC-AC-BR	Brazil	PC-AC-NA	North America
PC-AC-CHN	China	PC-AC-SWI	Switzerland
PC-AC-DEN	Denmark	PC-AC-TW	Taiwan
PC-AC-EC	Continental Europe	PC-AC-UK	United Kingdom
PC-AC-IN	India	PC-AC-UK	United Kingdom
PC-AC-IT	Italy		
Antennas and accessories			
AP-ANT-1W	2.4-2.5GHz (4dBi)/4.9-5.875GHz (6dBi), high-gain dual-band omni-directional detachable antenna, RP-SMA connector, direct mount, white, Indoor use only. 3 required.		
AP-ANT-13B	2.4-2.5GHz (4.4dBi)/4.9-5.9GHz (3.3dBi), down-tilt, smallest form factor omni-directional single antenna w/ ceiling mount hardware. RP-SMA pigtailed. 3 required.		
AP-ANT-16	2.4-2.5GHz (3.9dBi)/4.9-5.9GHz (4.7dBi), 3 element MIMO antenna in a single mechanical package, down-tilt omni-directional w/ ceiling mount hardware. RP-SMA pigtailed. 1 required.		
AP-ANT-19	2.4/5GHz dual-band, omni-directional 3dBi/6dBi, indoor/outdoor, RPSMA connector with 36 inch integrated pigtail cable. Pole mount hardware included. 3 required.		
AP-ANT-20W	2.4-2.5GHz (2dBi)/4.9-5.875GHz (2dBi), compact omni-directional direct-mount indoor antenna. RP-SMA, white. 3 required.		
AP-ANT-35A	Dual-band, 90 degree sector, 5dBi, ± 45 polarization and vert polarization, 3 element MIMO, 3 x RPSMA pigtailed 75 cm (30 in). Wall anchors for flush mount included. Optional pan/tilt bracket.		
AP-ANT-38	Dual-band, 60 degree sector, 8dBi, ± 45 and vert polarization, 3 element MIMO, 3 x RPSMA pigtailed 75 cm (30 in). Wall anchors for flush mount included. Optional pan/tilt bracket.		
ANT-3x3-5712	4.9-5.9GHz, 12.0dBi, 75°H x 25°V, H, V and 45° polarized 3 element MIMO high-gain directional sector antenna, 3 x N-type female connectors. Cables sold separately.		
ANT-2x2-5314	5.15-5.9GHz, 14dBi, 30° x 30°, H and V polarized MIMO high-gain directional panel antenna, 2 x N-type female connectors. Cable sold separately. Outdoor rated.		
ANT-2x2-2314	2.4GHz, 14dBi, 30° x 30°, H and V polarized MIMO high-gain directional panel antenna, 2 x N-type female connectors. Cable sold separately. Outdoor rated.		
AP-ANT-MNT-3	Azimuth and elevation adjustable mount kit for AP-ANT-35A, AP-ANT-38. Includes hardware for pole or wall mounting with AZ/EL adjustment.		
AFC2DL60-00	RP-SMA/M to N/F GR316 soft jumper, 60 cm, used between indoor products and Nm to Nm cables.		
AFCSJMTM-00	RP-SMA/M to N/M, 60 cm; used between indoor products and antennas without pigtail cables.		

*Select Dell Networking products carry an Extended Life Warranty with Basic Hardware Service. Warranty covers repair or replacement of the product for as long as it remains in use by the customer. In the event of discontinuance of product manufacture, Dell Extended Life Warranty extends until five (5) years after end of product model sales. Warranty limits any power supply, antennae or accessories to one (1) year from date of purchase. Warranty does not include troubleshooting, configuration, or other advanced service provided by Dell ProSupport. The Extended Life Limited Hardware Warranty is not transferrable. For more information see dell.com/warranty.

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