

# Alcatel-Lucent OmniAccess Stellar AP1451

**The Alcatel-Lucent OmniAccess® Stellar AP1451 premium high-end Wi-Fi 6E access point**, provides high-efficiency, high-performance 802.11ax aggregate data rates up to 10 Gbps across the 6 GHz, 5 GHz, and 2.4 GHz band. **Wi-Fi 6E technology enables you to better serve a higher density of clients, delivers more capacity for bandwidth-hungry and latency-sensitive applications, and provides a dependable secure network for Internet of Things (IoT) devices while increasing their battery-powered lifespan.**

The OmniAccess Stellar WLAN extensive portfolio deployment brings with it an **unparalleled experience in connectivity, coverage and performance** for the modern IoT-connected enterprise.



The Wi-Fi 6E premium high-end OmniAccess Stellar AP1451 is designed to accommodate the very dense and high-capacity needs of next-generation mobility and IoT-enabled networks. The access point is powered with five built-in radios, including: three 2.4 GHz/5 GHz/6 GHz radios serving high-density Wi-Fi clients, one radio dedicated for scanning, inherently improving network security and Wi-Fi quality, and an integrated Bluetooth/Zigbee radio enabling the growing needs of enterprise IoT connectivity powering location and building automation services. The OmniAccess Stellar AP1451 series supports a maximum aggregate data rate of 10 Gbps (1147 Mbps in 2.4 GHz, 4.8 Gbps in 5 GHz, 4.8 Gbps in 6 GHz). The access point's dual 10 Gbps uplinks provide Power over Ethernet (PoE) resiliency and load sharing.

The OmniAccess Stellar AP1451 supports 802.11ax features, which include OFDMA, DL MU-MIMO, UL MU-MIMO, 1024-QAM modulation and more, making tomorrow's diverse digital workspaces highly reliable and efficient.

The OmniAccess Stellar AP1451 features enhanced WLAN technology, with RF Radio Dynamic Adjustment, a distributed control Wi-Fi architecture, secure network admission control with Unified Access, built-in application intelligence and analytics, which makes it ideal for enterprises of all sizes that demand a simple, secure and scalable wireless solution. A built-in multi-band filter enables 5 GHz and 6 GHz operation across all available channels, providing the highest, best performance without restrictions.

## 802.11 ax high-efficiency features

IEEE 802.11 ax allows enterprises to deliver high-performance wireless LAN services with increased throughput, enabling more clients in dense environments and bringing power efficiency to IoT devices, while it remains fully backward compatible with existing 802.11 a/b/g/n/ac deployments. The 802.11 ax standard is a dramatic step forward in wireless LAN technology for all organisations. Some of the key 802.11 ax features enabled on OmniAccess Stellar AP1451 include:

- Orthogonal frequency division multiple access (OFDMA) enabling more clients to simultaneously operate in the same channel and thereby improve efficiency, latency and throughput. OFDMA can concurrently address multiple clients in both directions downlink (DL) and uplink (UL), including OFDMA Resource Units (RUs). OFDMA is very effective in environments where there are many devices with short frames demanding lower latency
- Multi-user multiple input, multiple output (MU-MIMO) allowing more data to be transferred at once and enables an access point to handle a larger number of concurrent clients
- 1024 quadrature amplitude modulation mode (1024-QAM) which can boost peak data-rates by as much as 25 percent
- BSS Coloring improves spatial reuse in dense environments by providing a mechanism for colour coding different overlapping BSS's, allowing more simultaneous transmissions
- Extended Range (ER) provides increased coverage in scenarios where the receiving side encounters high path loss and channel delay spread, especially in outdoor environments
- Target Wake Time (TWT) makes Wi-Fi 6 devices more power efficient. This capability lets client devices sleep much longer, and wake up to less contention, extending the battery life of smart phones, IoT sensors, and other devices.
- Transmit beamforming improves signal power, resulting in significantly higher rates at a given range

## Deliver enterprise-grade security and scale with simplicity

The OmniAccess Stellar AP1451 enables a **visionary distributed Wi-Fi architecture with centralised management and policy control**. This enforces security at every step starting at the network edge, allowing unparalleled scale in network capacity. This architecture is vital for enabling the next generation of digital enterprise that demands business agility, seamless mobility and secure IoT-enabled infrastructure, empowering business transformation through continuous innovation.

The OmniAccess Stellar AP1451 provides **enhanced security with WPA3, a new security standard for enterprise and public networks**, improving Wi-Fi security by using advanced security algorithms and stronger ciphers in enterprises, including the 192-bit security suite. Public spaces that provide open non-protected access can now provide encryption and privacy using OmniAccess Stellar, which supports a new security standard Wi-Fi Enhanced Open based on Opportunistic Wireless Encryption (OWE).

The access points can be deployed in three different modes, all through a single version of software, simplifying IT operations.

For medium- to large-sized enterprises, **Alcatel-Lucent OmniVista® Network Management System (NMS)** provides secure plug-and-play APs for large scale deployment, with user friendly workflows for wireless services and unified access for end-to-end security. It comes with integrated unified policy authentication manager (UPAM) which helps define the authentication strategy and policy enforcement for employees, guest management and BYOD devices. The OmniAccess Stellar AP1451 has built-in DPI technology, providing real-time Application Monitoring and enforcement capabilities. The network administrator can obtain a comprehensive view of applications running in the network and apply adequate controls to optimise the network performance for business-critical applications. OmniVista NMS provides advanced options for RF management, wIDS/wIPS for intrusion detection and prevention, and heatmaps for WLAN site planning. To further simplify IT, the APs can be managed as one or more access point groups (a logical grouping of one or more access points).

## Cloud-enabled with Alcatel-Lucent OmniVista Cirrus Network Management as a Service

The OmniAccess Stellar AP1451 can be managed by the **Alcatel-Lucent OmniVista® Cirrus Network Management as a Service cloud platform**. OmniVista Cirrus powers a secure, resilient and scalable cloud-based network management platform. It offers hassle-free network deployment and easy service rollout with advanced analytics for smarter decision making. OmniVista Cirrus also offers IT-friendly unified access with secure authentication and policy enforcement for users and devices.

## On-premises deployment with the Alcatel-Lucent OmniVista 2500 Network Management System (NMS)

The OmniAccess Stellar AP1451 can be **managed on premises from the OmniVista 2500 NMS**.

For small- to medium-size enterprises, **Wi-Fi Express provides secure web managed (HTTPS) cluster deployment**.

By default, the OmniAccess Stellar AP1451 can operate in a cluster architecture to provide simplified plug-and-play deployment. The AP cluster is an autonomous system that consists of a group of OmniAccess Stellar APs which is managed by one AP that is elected as the primary virtual manager. One AP cluster supports up to 255 APs.

The AP cluster architecture ensures simplified and quick deployment. Once the first AP is configured using the configuration wizard, the remaining APs in the network will come up automatically with an updated configuration. This ensures the whole network is up and functional within a few minutes.

The OmniAccess Stellar AP1451 also supports secure **zero-touch provisioning with Alcatel-Lucent OXO Connect R2** which provides a mechanism by which all APs in a cluster will obtain bootstrap data securely from an on-premises OXO Connect.

The W-Fi Express mode supports role-based management access to the AP cluster, which includes Admin, Viewer and GuestOperator access. GuestOperator access simplifies guest account management and can be used by any non-IT person such as a front desk worker or receptionist. The OmniAccess Stellar AP1451 also supports a built-in customisable captive portal which enables customers to offer a secure and seamless guest access experience.

## Quality of service for unified communication apps

The OmniAccess Stellar AP1451 supports fine-tuned, **quality of service (QoS) parameters to differentiate and provide appropriate QoS for each application** such as voice, video and desktop sharing. Application aware RF scanning avoids interruption of real-time applications.

## RF management

Radio Dynamic Adjustment (RDA) technology automatically assigns channels and power settings, provides DFS/TPC, and ensures that APs stay clear of all radio frequency interference (RFI) sources to deliver reliable high-performance WLAN. The OmniAccess Stellar AP1451 can be configured to provide part-time or dedicated scanning for spectrum analysis and wireless intrusion protection.

## Product specifications

Feature	Description
Radio specification	<ul style="list-style-type: none"> <li>• AP type: Indoor Wi-Fi 6E (802.11ax)</li> <li>• Tri Radio, 6 GHz High 4x4:4, 5 GHz 8x8:8, and 2.4 GHz 4x4:4 <ul style="list-style-type: none"> <li>– 6 GHz High: 4x4:4 up to 4.8 Gbps wireless data rate to individual 4SS HE160 802.11ax client devices.</li> <li>– 5 GHz: 8x8:8 up to 4.8 Gbps wireless data rate to individual 8SS HE80 or 4SS HE160(80+80) 802.11ax client devices.</li> <li>– 2.4 GHz: 4x4:4 up to 1147 Mbps wireless data rate to individual 4SS HE40 802.11ax client devices.</li> </ul> </li> <li>• Supported frequency bands (country-specific restrictions apply): <ul style="list-style-type: none"> <li>– 2.400 to 2.4835 GHz</li> <li>– 5.150 to 5.250 GHz</li> <li>– 5.250 to 5.350 GHz</li> <li>– 5.470 to 5.725 GHz</li> <li>– 5.725 to 5.850 GHz</li> <li>– 5.925 to 6.425 GHz</li> <li>– 6.425 to 6.525 GHz</li> <li>– 6.525 to 6.875 GHz</li> <li>– 6.875 to 7.1250 GHz</li> </ul> </li> <li>• Available channels: Dependent on configured regulatory domain</li> <li>• Brazil: Maximum transmit power: 24 dBm on 2.4 GHz, 24 dBm on 5 GHz</li> <li>• Maximum transmit power (limited by local regulatory requirements): <ul style="list-style-type: none"> <li>– 24 dBm on 2.4GHz (18 dBm per chain)</li> <li>– 27 dBm on 5 GHz (18 dBm per chain)</li> <li>– 22 dBm on 6 GHz (16 dBm per chain)</li> </ul> </li> <li>• DFA (Dynamic Frequency Adjustment) optimises available channels and provides proper transmission power</li> <li>• Short guard interval for 20-MHz, 40-MHz, 80-MHz and 160-MHz channels</li> <li>• Transmit beamforming (TxBF) for increased signal reliability and range</li> <li>• 802.11n/ac packet aggregation: Aggregated Mac Protocol Data Unit (A-MPDU), Aggregated Mac Service Data Unit (A-MSDU)</li> <li>• Supported data rates (Mbps): <ul style="list-style-type: none"> <li>– 802.11b: 1, 2, 5.5, 11</li> <li>– 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54</li> <li>– 802.11n (2.4 GHz): 6.5 to 300 (MCS0 to MCS7, HT20 to HT40)</li> <li>– 802.11n (5 GHz): 6.5 to 600 (MCS0 to MCS7, HT20 to HT40)</li> <li>– 802.11ac: 6.5 to 3466 (MCS0 to MCS9, NSS = 1 to 8, VHT20 to VHT160(80+80))</li> <li>– 802.11ax (2.4 GHz): 3.6 to 1147 (MCS0 to MCS11, NSS = 1 to 4, HE20 to HE40)</li> <li>– 802.11ax (5 GHz): 3.6 to 4804 (MCS0 to MCS11, NSS = 1 to 8, HE20 to HE160(80+80))</li> <li>– 802.11ax (6 GHz): 3.6 to 4804 (MCS0 to MCS11, NSS = 1 to 4, HE20 to HE160)</li> </ul> </li> <li>• Supported modulation types: <ul style="list-style-type: none"> <li>– 802.11b: BPSK, QPSK, CCK</li> <li>– 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM</li> <li>– 802.11ax: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM</li> </ul> </li> <li>• 802.11n high-throughput (HT) support: HT 20/40</li> <li>• 802.11ac very high throughput (VHT) support: VHT 20/40/80/160</li> <li>• 802.11ax high efficiency (HE) support: HE 20/40/80/160</li> <li>• Advanced Cellular Coexistence (ACC) <ul style="list-style-type: none"> <li>– Minimises interference from 3G/4G cellular networks, distributed antenna systems, and commercial small cell/femtocell equipment</li> </ul> </li> <li>• 2.4/5 GHz 1x1 radio, dedicated for scanning</li> <li>• Bluetooth 5/Zigbee: up to 6 dBm transmit power (class 1) and -93 dBm receive sensitivity</li> <li>• 2x multi-Gigabit 1/2.5/5/10 Gig autosensing RJ-45 ports, Eth0-Eth1, Power over Ethernet (PoE) 802.3bt compliant</li> <li>• 1x USB 3.0 Type A (5V, 500mA)</li> <li>• Console</li> <li>• Reset button: Factory reset</li> </ul>
Visual indicators (Tri-color LED)	<ul style="list-style-type: none"> <li>• For system and radio status <ul style="list-style-type: none"> <li>– Red flashing: System abnormal, link down</li> <li>– Red light: System startup</li> <li>– Red and blue rotate flashing: System running, OS upgrading</li> <li>– Blue light: System running, dual bands working</li> <li>– Green flashing: System running, no SSID created</li> <li>– Green light: System running, single band working</li> <li>– Red, blue and green rotate flashing</li> <li>– System running, use for location of an AP</li> </ul> </li> </ul>

Feature	Description		
Security	<ul style="list-style-type: none"> <li>• Integrated Trusted Platform Module (TPM 2.0) for secure storage of credentials and keys</li> <li>• 802.11i, WPA2, WPA3, Enterprise with CNSA Option, Personal (SAE)</li> <li>• 802.1X</li> <li>• WEP, Advanced Encryption Standard (AES), Temporal Key Integrity Protocol (TKIP)</li> <li>• Firewall: ACL, wIPS/wIDS and DPI application policy enforcement with OmniVista</li> <li>• Portal page authentication</li> </ul>		
Antenna	<ul style="list-style-type: none"> <li>• Integrated omni-directional antennas with maximum antenna gain of 3.9 dBi in 2.4 GHz, 3.9 dBi in 5 GHz, 3.9 dBi in 6 GHz and 3.5 dBi in BLE</li> </ul>		
Receive sensitivity	2.4 GHz	5 GHz	6 GHz
1 Mbps	-99		
11 Mbps			
6 Mbps	-91		
54 Mbps	-94	-93	
HT20(MCS0/8)	-77	-77	
HT20(MCS7/15)	-94	-93	
HT40(MCS0/8)	-76	-76	
HT40(MCS7/15)	-91	-91	
VHT20(MCS0)	-74	-74	
VHT20(MCS8)	-94	-93	
VHT40(MCS0)	-72	-72	
VHT40(MCS9)	-91	-91	
VHT80(MCS0)	-68	-68	
VHT80(MCS9)		-88	
HE20(MCS0)		-64	
HE20(MCS11)	-94	-93	-93
HE40(MCS0)	-65	-65	-65
HE40(MCS11)	-91	-91	-90
HE80(MCS0)	-62	-62	-62
HE80(MCS11)		-88	-87
HE160(MCS0)		-59	-59
HE160(MCS11)			-84
			-56

Note: Maximum transmit power is limited by local regulatory settings.

Maximum transmit power (per chain)	2.4 GHz	5 GHz	6 GHz
1 Mbps	18 dBm		
11 Mbps	18 dBm		
6 Mbps	18 dBm		
54 Mbps	17 dBm	18 dBm	
HT20(MCS0/8)	18 dBm	16 dBm	
HT20(MCS7/15)	16 dBm	17 dBm	
HT40(MCS0/8)	18 dBm	15 dBm	
HT40(MCS7/15)	16 dBm	17 dBm	
VHT20(MCS0)	18 dBm	15 dBm	
VHT20(MCS8)	16 dBm	17 dBm	
VHT40(MCS0)	18 dBm	15 dBm	
VHT40(MCS9)	15 dBm	17 dBm	
VHT80(MCS0)		15 dBm	
VHT80(MCS9)		17 dBm	
HE20(MCS0)	18 dBm	14 dBm	
HE20(MCS11)	13 dBm	16 dBm	16 dbm
HE40(MCS0)	18 dBm	13 dBm	13 dbm
HE40(MCS11)	13 dBm	16 dBm	16 dbm
HE80(MCS0)		13 dBm	13 dbm
HE80(MCS11)		16 dBm	16 dbm
HE160(MCS0)		13 dBm	13 dbm
HE160(MCS11)			16 dbm
			13 dbm

Note: Maximum transmit power is limited by local regulatory settings.

Feature	Description
Power	<ul style="list-style-type: none"> <li>• Supports direct DC power and Power over Ethernet (PoE)</li> <li>• When both power sources are available, DC power takes priority over PoE</li> <li>• Direct DC source: <ul style="list-style-type: none"> <li>• 48V DC nominal, +/- 5%</li> </ul> </li> <li>• Power over Ethernet (PoE): <ul style="list-style-type: none"> <li>• IEEE 802.3bt compliant source</li> <li>• Maximum (worst case) power consumption: <ul style="list-style-type: none"> <li>• 49W (input IEEE 802.3bt POE); Unrestricted functionality</li> <li>• 45W (input dual IEEE 802.3at POE); The USB port is disabled</li> <li>• 24W (input IEEE 802.3at POE); The USB port is disabled, Eth1 is disabled, tri radio downgrade to 2 x 2</li> </ul> </li> </ul> </li> </ul>
Mounting	<ul style="list-style-type: none"> <li>• Ceiling/wall mounting (Mount kit needs to be ordered separately)</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Operating: <ul style="list-style-type: none"> <li>– Temperature: 0°C to 45°C (-32°F to +113°F)</li> <li>– Humidity: 10% to 90% non-condensing</li> </ul> </li> <li>• Storage and transportation: <ul style="list-style-type: none"> <li>– Temperature: -40°C to +70°C (-40°F to +158°F)</li> <li>– Humidity: 5% to 95% non-condensing</li> </ul> </li> </ul>
Dimension	<ul style="list-style-type: none"> <li>• Single AP excluding packing box and accessories: <ul style="list-style-type: none"> <li>– 260mm (W) x 260mm (D) x 60mm (H) - 10.23" (W) x 10.23" (D) x 2.36" (H)</li> <li>– 2370 g/5.23 lb</li> </ul> </li> <li>• Single AP including packing box and accessories: <ul style="list-style-type: none"> <li>– 298mm (W) x 317mm (D) x 111mm (H) - 11.73" (W) x 12.48" (D) x 4.37" (H)</li> <li>– 2830 g/6.23 lb</li> </ul> </li> </ul>
Reliability	<ul style="list-style-type: none"> <li>• MTBF: 572,332h (65.33 years) at +25° C operating temperature</li> </ul>
Capacity	<ul style="list-style-type: none"> <li>• Up to 8 SSID/Radio (24 BSSID/AP), hardware ready for 16 SSID per radio (48 SSID/AP)</li> <li>• Support for up to 1536 associated client devices</li> </ul>
Software feature	<ul style="list-style-type: none"> <li>• Up to 4K APs when managed by OmniVista 2500. No limit on number of AP groups</li> <li>• Up to 255 APs per web managed (HTTP/ HTTPS) cluster</li> <li>• Auto channel selection</li> <li>• Auto transmit power control</li> <li>• Bandwidth control per SSID</li> <li>• L2 roaming</li> <li>• L3 roaming with OmniVista 2500</li> <li>• Captive portal (Internal/External)</li> <li>• Guest self-registration optional SMS notification) with OmniVista 2500</li> <li>• Internal user database</li> <li>• RADIUS client</li> <li>• Guest social-login with OmniVista 2500</li> <li>• RADIUS proxy authentication with OmniVista 2500</li> <li>• LDAP/AD proxy authentication with OmniVista 2500</li> <li>• Wireless QoS</li> <li>• Band steering</li> <li>• Client smart load balance</li> <li>• Client sticky avoidance</li> <li>• User behavior tracking</li> <li>• White/Block list</li> <li>• Zero-touch provisioning (ZTP)</li> <li>• NTP Client</li> <li>• ACL</li> <li>• DHCP/DNS/NAT</li> <li>• Wireless MESH P2P/P2MP</li> <li>• Wireless Bridge</li> <li>• Rogue AP location and containment</li> <li>• Dedicated Scanning AP</li> <li>• System log report</li> <li>• SSHv2</li> <li>• SNMPv2, SNMPv3</li> <li>• Wireless attack detection with OmniVista 2500</li> <li>• Floor plan and heat map with OmniVista 2500</li> <li>• Stanley Healthcare/Aeroscout RTLS support</li> </ul>

Feature	Description
IEEE standard	<ul style="list-style-type: none"> <li>• IEEE 802.11a/b/g/n/ac/ax</li> <li>• IEEE 802.11e WMM, U-APSD</li> <li>• IEEE 802.11h, 802.11i, 802.11e QoS</li> <li>• IEEE 802.1Q (VLAN Tagging)</li> <li>• 802.11k Radio Resource Management</li> <li>• 802.11v BSS Transition Management</li> <li>• 802.11r Fast roaming</li> <li>• 802.11w Protected Management Frames</li> </ul>
Regulatory and certification	<ul style="list-style-type: none"> <li>• CB Scheme Safety, cTUVus</li> <li>• Wi-Fi CERTIFIED Wi-Fi 6E, Passpoint R3</li> <li>• FCC</li> <li>• CE Marked</li> <li>• EN 60601-1-1 &amp; EN 60601-1-2</li> <li>• Bluetooth SIG</li> <li>• RoHS, REACH, WEEE</li> <li>• EMI and susceptibility (Class B)</li> <li>• UL2043 Plenum Rating</li> <li>• 2014/35/EU Low Voltage Directive</li> <li>• 2014/30/EU EMC Directive</li> <li>• 2011/65/EU RoHS Directive</li> <li>• 2014/53/EU Radio Equipment Directive</li> <li>• EN 55032</li> <li>• IEC/EN 60950 and 62368</li> <li>• EN 300 328</li> <li>• EN 301 893</li> <li>• EN 301 489-1</li> <li>• EN 301 489-17</li> </ul>

## Ordering information

Access Points	Description
OAW-AP1451-RW	OmniAccess Stellar Indoor AP1451. Tri radio 2.4+5+6GHz 4x4+8x8+4x4 Wi-Fi6E, integrated omni antenna. 1x1 scanning, BLE/Zigbee radio. 2x 10GE up, 1x RS-232 Console, USB, 48V DC. AP mount to be ordered separately. Not for use in US, Egypt, Japan.
OAW-AP1451-US	OmniAccess Stellar Indoor AP1451. Tri radio 2.4+5+6GHz 4x4+8x8+4x4 Wi-Fi6E, integrated omni antenna. 1x1 scanning, BLE/Zigbee radio. 2x 10GE up, 1x RS-232 Console, USB, 48V DC. AP mount to be ordered separately. Restricted Regulatory Domain: US.

Accessories	Description
AP-MNT-IN-BE (single pack)	Indoor mounting kit enhanced, Type B1 (9/16) and Type B2 (15/16) for T shaped ceiling rail mounting. Applicable for OmniAccess Stellar AP1101, AP12xx, AP13xx and AP14xx series.
OAW-AP-MNT-W (single pack)	Mounting kit, Type A wall mount and ceiling mount with screws. Applicable for OmniAccess Stellar Indoor 1101, 12xx, AP13xx and AP14xx series
OAW-AP-MNT-W-10 (10 pack)	Mounting kit, Type A wall mount and ceiling mount with screws. Applicable for OmniAccess Stellar Indoor 1101, 12xx, AP13xx and AP14xx series.
AP-MNT-IN-CE (single pack)	Indoor mounting kit enhanced, Type C1 (Open Silhouette) and C2 (Flanged Interlude), for other shaped ceiling rail mounting. Applicable for OmniAccess Stellar AP1101, AP12xx, AP13xx and AP14xx series.
POE60U-1BT-X-R	1-Port IEEE 802.3bt PoE Midspan. Port speed 10G PoE power 60W. No power cord included. Please order PWR-CORD-XX for country specific power cord.
ADP-50GRBD	48V/50W AC-to-DC Power Adapter with Type A DC plug 2.1*5.5*9.5mm circular, straight. Please order PWR-CORD-XX for country specific power cord.

## Warranty

OmniAccess Stellar Access Points come with a Hardware Limited Lifetime Warranty (HLLW).

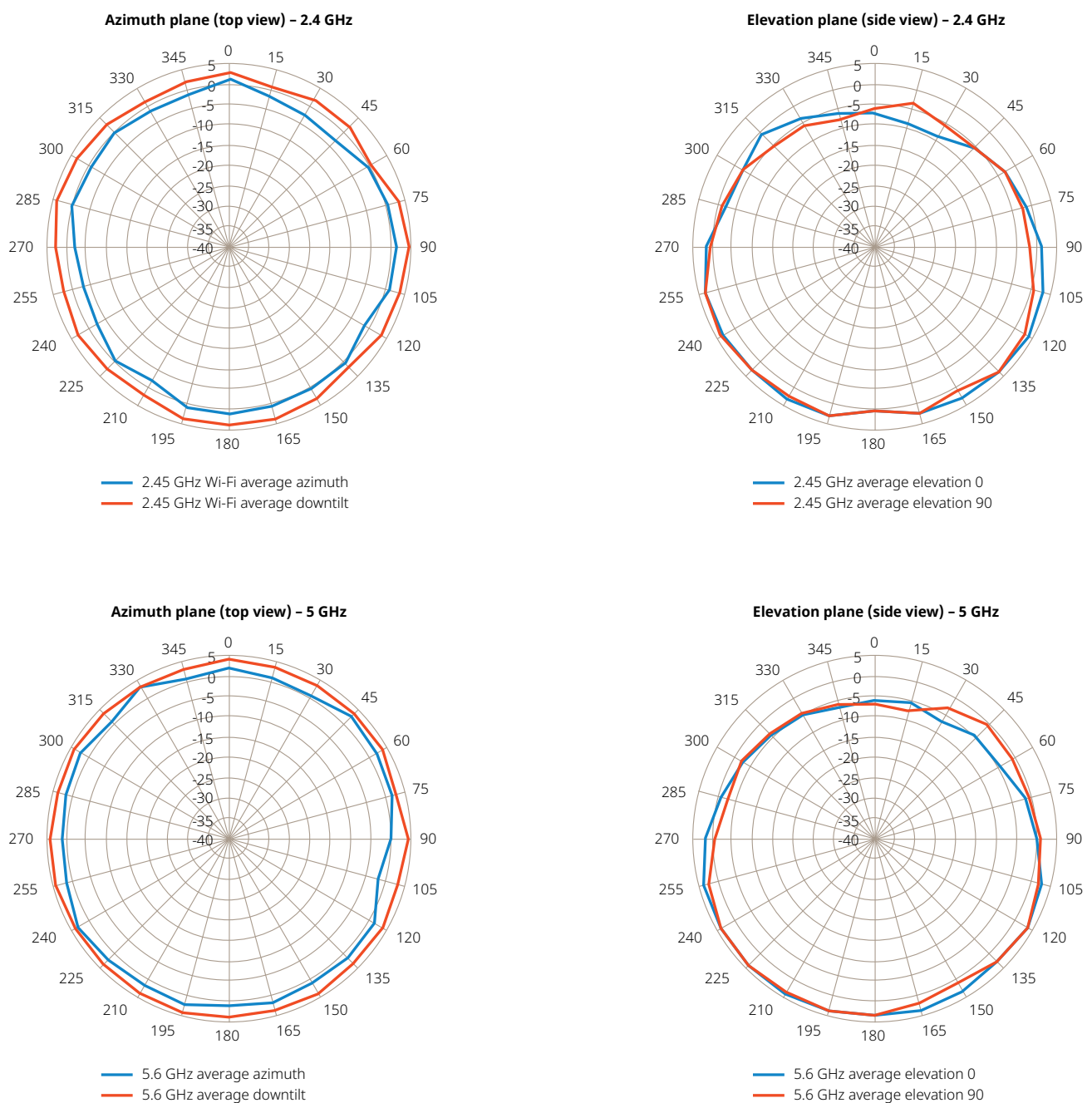
## Services and support

OmniAccess Stellar Access Points include one (1) year of complementary SUPPORT Software for partners.

For more information about our Professional services, Support services, and Managed services, please go to:

<http://enterprise.alcatel-lucent.com/?services=EnterpriseServices&page=directory>

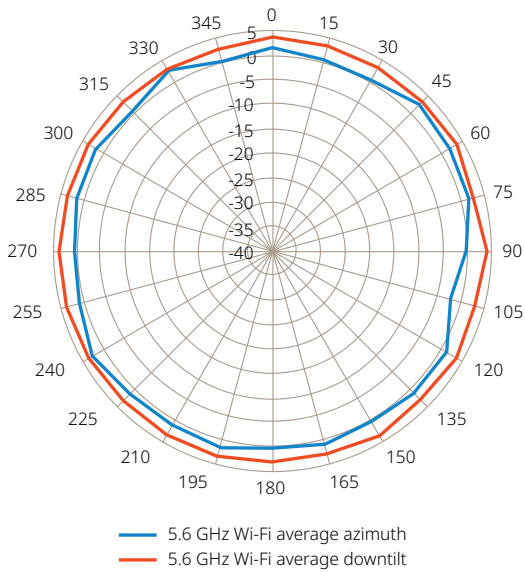
Figures. OmniAccess AP1451 antenna pattern plots



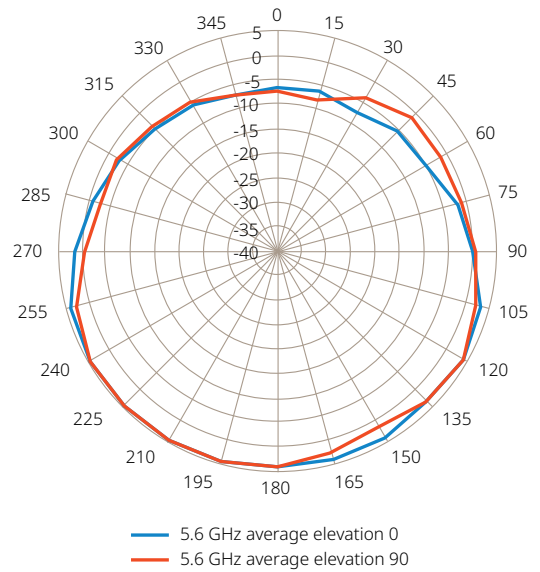


BLE radio antenna pattern

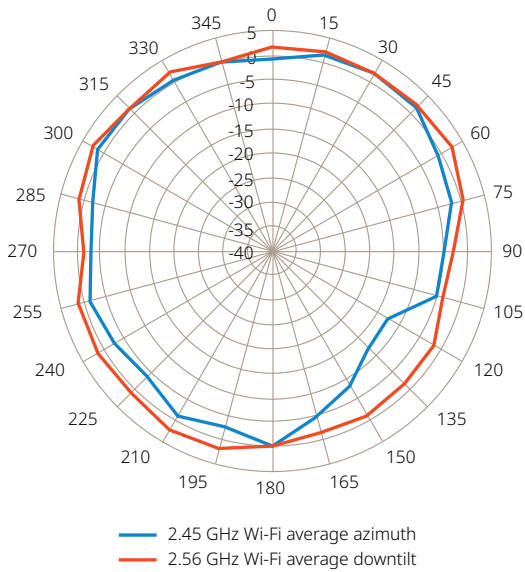
**Azimuth plane (top view) - 6 GHz**



**Elevation plane (side view) - 6 GHz**



**Azimuth plane (top view) - BLE**



**Elevation plane (side view) - BLE**

