# Cisco Wireless IP Phone 8821-EX



The Cisco® Wireless IP Phone 8821-EX is a ruggedized, resilient, and secure 802.11 wireless LAN handset that delivers cost-effective, on-premises, comprehensive Voice over Wireless LAN (VoWLAN) communications for the highly mobile in-campus worker.

Availability Planned Q4 CY 2018

The 8821-EX is specifically designed for workers whose roles are in more rigorous, industrial settings. Examples of ideal use cases include nurses and doctors in healthcare, operations and engineering staff in manufacturing, customer service representatives in retail, service staff such as maids in hospitality, and workers on rigs in the oil and chemical industries.

The 8821-EX builds upon all of the features offered by the Cisco Wireless IP Phone 8821 and adds nonsparking support for temporary exposure within potentially combustible environments. It is ATEX Class I, Zone 2 and CSA Class I, Division 2 certified. ATEX Zone 2 is defined as an area in which an explosive gas atmosphere is not likely to occur in normal operation and, if it does occur, is likely to do so only infrequently and will exist for a short period only (for example, less than 10 hours per year). Similarly, CSA Class I is a location where a quantity of flammable gas or vapor sufficient to produce an explosive or ignitable mixture may be present in the air. Division 2 is a location where a classified hazard does not normally exist but is possible under abnormal conditions. Zone 2 is an area in which an explosive gas atmosphere does not normally exist.

While the 8821-EX is sleek and lightweight, the design is hardened for users. It is Ingress Protection standard (IP67) rated and is sealed for protection against dust, splash, and water. The device is also MIL-STD-810G tested, with a dozen drops onto concrete from heights of up to 6 feet (1.8m), to help ensure shock resistance and avoid breakage if dropped.

The 8821-EX enhances security and simplifies configuration management. Stronger encryption is supported for certificate management and policies enablement with the EX model's support of Secure Hash Algorithm 2 (SHA-2). Simple Certificate Enrollment Protocol (SCEP) eases IT administration by enabling automatic certificate management on the device.

End users will enjoy a larger, higher-resolution color display (Figure 1) and a user experience that is common with Cisco IP Phone 8800 Series desk phones. In addition, roaming between access points within the campus will support more seamless voice communications with the 8821-EX's support of Fast Transition (802.11r). This protocol was specifically designed for mobile Voice over IP (VoIP) communications devices within Wi-Fi networks. Bluetooth is supported for the user's choice of third-party wireless headsets and adds freedom by untethering the user from the handset.

The 8821-EX supports Cisco and third-party XML applications such as push-to-talk.

A full suite of accessories, including desktop chargers, cases, holsters, and multicharger, are available from Cisco to support deployments. Consult the [Cisco Wireless IP Phone 8821/8821-EX Accessories Guide options](#) and details.

**Figure 1.**     Cisco Wireless IP Phone 8821-EX



## Features

The Cisco Wireless IP Phone 8821-EX (Figure 1) delivers all the capabilities of the Cisco Wireless IP Phone 8821 with the ruggedness and resiliency certification needed for deployment in environments such as chemical and manufacturing plants, utilities, and oil refineries.

Features include:

- ATEX Class I Zone 2 certification
- U.S. and Canada Class I Division 2 and Class I Zone 2 certification
- Industry-standard yellow styling offers fast recognition if an emergency occurs
- IEEE 802.11a/b/g/n/ac radio for VoWLAN communications support
- The large 2.4-inch (6 cm) color (240 x 320 pixels) display makes viewing easy
- IP67 rated for protection against dust, splash, and water
- Compliant with MIL-STD-810G standard for shock resistance
- Offers exceptional voice quality with High-Definition (HD) voice

- Built-in full-duplex speakerphone offers high-quality hands-free communications
- Supports third-party Bluetooth 3.0 headsets and a 3.5-mm headphone jack for added freedom
- Applications key provides direct access to XML applications such as push-to-talk and Lone Worker
- Battery life delivers up to 9.5 hours of talk time
- Enhanced encryption support for SHA-1 and SHA-2 signatures
- Fast, secure roaming using 802.11r and Cisco Centralized Key Management roaming
- Automatic certificate renewal – SCEP support

Table 1 provides a list of the phone's features, Table 2 summarizes its wireless characteristics, Table 3 lists specifications, and Table 4 provides certification and compliance information.

**Table 1.**    Features

| Item | Description |
| --- | --- |
| **Features** | <ul><li>Six line appearances</li><li>Abbreviated dialing</li><li>Adjustable ringing and volume levels</li><li>Adjustable display brightness and timeout</li><li>Audible and vibrating ringers</li><li>Auto-answer</li><li>Auto-detection of headset and auto-answer from headset</li><li>Automatic keypad lock</li><li>Callback</li><li>Call forward</li><li>Call history lists</li><li>Call park</li><li>Call pickup</li><li>Call timer</li><li>Call waiting</li><li>Caller ID</li><li>cBarge</li><li>Corporate directory</li><li>Conference</li><li>Direct transfer</li><li>Extension mobility service</li><li>Fast-dial service</li><li>Group call pickup</li><li>Hold</li><li>Hotkey for keypad lock, ring silent mode, and voicemail access</li><li>Immediate divert</li><li>Join</li><li>Last-number redial – green key</li><li>Malicious caller</li><li>Message-waiting indicator</li><li>Meet-me conference</li><li>Multilevel Precedence and Preemption (MLPP)</li><li>Music on hold</li><li>Mute</li><li>Network profiles (4)</li><li>OPickUp</li><li>Personal directory</li><li>Predialing before sending</li><li>Privacy</li></ul> |

| Item | Description |
|---|---|
| | • Presence<br>• Quality Report Tool (QRT)<br>• Redial<br>• Ring tone per line appearance<br>• Service URL<br>• Shared line<br>• Time and date display<br>• Transfer<br>• Network hold<br>• Hospitality<br>• Support for mutual-authentication TLS<br>• Cisco Unified Communications Manager WLAN profiles<br>• +Dialing<br>• Application launch pad<br>• Busy Lamp Field (BLF)<br>• BLF pickup<br>• BLF speed dial<br>• Call forward notification<br>• Forced authorization and client matter codes<br>• Intercom<br>• Mobility<br>• Silent monitoring and recording<br>• Speed dial<br>• Voicemail<br>• Whisper coaching<br>• Ring setting – phone active (ring, ring once, beep, flash)<br>• Predictive search on new call |
| Buttons | • Power button<br>• Volume up/down<br>• Two soft-key buttons to access screen-based applications, features, and functions<br>• Green key (answer/send/redial) and red key (power/end call)<br>• Application button<br>• Mute<br>• Speakerphone<br>• Five-way navigation support<br>• Numeric keypad (0-9, *, & #) |
| Codecs | • G.711a, G.711u<br>• G.729a, G.729ab<br>• G.722<br>• Internet Low Bitrate Codec (iLBC) audio-compression codecs<br>• iSAC |
| LEDs | • Ring, message waiting, Wi-Fi status, and charging LEDs |
| Protocol | • Session Initiation Protocol (SIP) |
| Call control | • Cisco Unified Communications Manager: 9.1(2), 10.5(2), 11.0(1), and later<br>• Cisco Unified Survivable Remote Site Telephony (SRST): 10.5, 11.0, 11.5, 11.7, and later<br>• Cisco Unified Communications Manager Express: 10.5, 11.0, 11.5, 11.7(native support) and later<br>• Cisco Hosted Collaboration Solution (HCS): 9.x, 10.x, 11.x, and later |
| Security features | • Certificates<br>• Image authentication<br>• Device authentication<br>• File authentication<br>• Signaling authentication<br>• Secure Cisco Unified SRST<br>• Media encryption using Secure Real-Time Protocol (SRTP) |

| Item | Description |
|---|---|
| | • Signaling encryption using Transport Layer Security (TLS) Protocol<br>• Certificate Authority Proxy Function (CAPF)<br>• Simple Certificate Enrollment Protocol (SCEP) support for certificates renewal<br>• Secure profiles<br>• Encrypted configuration files<br>• Cryptography is not enabled by default and may be enabled only through a cryptographically enabled Cisco Unified Communications Manager |
| **Provisioning and management** | • Configuration via Unified Communications Manager, SRST, and Unified Communications Manager Express administration interfaces<br>• Bulk provisioning support via desktop charger and USB to Ethernet dongle combination<br>• Web server for configuration and statistics<br>• Capability to disable local phone settings<br>• Quality of Service (QoS) reporting: Jitter, delay, dropped packets, and latency on a per-call basis<br>• Real Time Control Protocol (RTCP) support and monitoring<br>• Syslog |
| **Configuration options** | • Dynamic Host Configuration Protocol (DHCP) client or static configuration<br>• Support for online firmware upgrades using Trivial File Transfer Protocol (TFTP)<br>• Domain Name System (DNS) |
| **Application framework** | • XML (support push-to-talk, paging, and other 3$^{rd}$ party applications) |
| **User localization** | Arabic, Bulgarian, Catalan, Chinese (Hong Kong), Chinese (China), Chinese (Taiwan), Croatian, Czech, Danish, Dutch, English (United Kingdom), English (United States), Estonian, Finnish, French (Canada), French (France), German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese (Brazil), Portuguese (Portugal), Romanian, Russian, Serbian, Slovak, Slovenian, Spanish (Spain), Spanish (Colombia), Swedish, Thai, and Turkish |
| **Network localization** | Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Colombia, Cyprus, Czech Republic, Denmark, Egypt, Finland, France, Germany, Ghana, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kenya, Korea Republic, Lebanon, Luxembourg, Malaysia, Mexico, Nepal, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Russian Federation, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, United States, Venezuela, and Zimbabwe |

**Table 2.** Wireless Characteristics

| Item | Specifications |
|---|---|
| **Protocols** | • IEEE 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac |
| **Frequency bands and operating channels** | • 2.412 to 2.472 GHz (channels 1 to 13)<br>• 5.180 to 5.240 GHz (channels 36 to 48)<br>• 5.260 to 5.320 GHz (channels 52 to 64)<br>• 5.500 to 5.700 GHz (channels 100 to 140)<br>• 5.745 to 5.825 GHz (channels 149 to 165)<br>• IEEE 802.11d can be used to identify available channels |
| **Nonoverlapping channels** | • 2.4 GHz (20-MHz channels): up to 3 channels<br>• 5 GHz (20-MHz channels): up to 24 channels<br>• 5 GHz (40-MHz channels): up to 9 channels<br>• 5 GHz (80-MHz channels): up to 4 channels |
| **Operating modes** | • Auto (preference to 5 GHz)<br>• 2.4 GHz only<br>• 5 GHz only |
| **Data rates** | • 802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps<br>• 802.11b: 1, 2, 5.5, and 11 Mbps<br>• 802.11g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps<br>• 802.11n: HT MCS 0, MCS 1, MCS 2, MCS 3, MCS 4, MCS 5, MCS 6, and MCS 7<br>• 802.11ac: VHT MCS 0, MCS 1, MCS 2, MCS 3, MCS 4, MCS 5, MCS 6, MCS 7, MCS 8, and MCS 9 (MCS 9 available with VHT40 and VHT80 only) |

| Item | Specifications | | |
|---|---|---|---|
| **2.4-GHz receiver sensitivity** | IEEE 802.11b:<br>• 1 Mbps: -98 dBm<br>• 2 Mbps: -96 dBm<br>• 5.5 Mbps: -93 dBm<br>• 11 Mbps: -91 dBm | IEEE 802.11g:<br>• 6 Mbps: -95 dBm<br>• 9 Mbps: -94 dBm<br>• 12 Mbps: -93 dBm<br>• 18 Mbps: -90 dBm<br>• 24 Mbps: -87 dBm<br>• 36 Mbps: -84 dBm<br>• 48 Mbps: -79 dBm<br>• 54 Mbps: -77 dBm | IEEE 802.11n HT20:<br>• MCS 0: -95 dBm<br>• MCS 1: -92 dBm<br>• MCS 2: -90 dBm<br>• MCS 3: -87 dBm<br>• MCS 4: -83 dBm<br>• MCS 5: -78 dBm<br>• MCS 6: -77 dBm<br>• MCS 7: -75 dBm |
| **5-GHz receiver sensitivity** | IEEE 802.11a:<br>• 6 Mbps: -94 dBm<br>• 9 Mbps: -93 dBm<br>• 12 Mbps: -92 dBm<br>• 18 Mbps: -89 dBm<br>• 24 Mbps: -86 dBm<br>• 36 Mbps: -83 dBm<br>• 48 Mbps: -78 dBm<br>• 54 Mbps: -76 dBm | IEEE 802.11n HT20:<br>• MCS 0: -94 dBm<br>• MCS 1: -91 dBm<br>• MCS 2: -89 dBm<br>• MCS 3: -86 dBm<br>• MCS 4: -82 dBm<br>• MCS 5: -77 dBm<br>• MCS 6: -76 dBm<br>• MCS 7: -74 dBm | IEEE 802.11n HT40:<br>• MCS 0: -91 dBm<br>• MCS 1: -88 dBm<br>• MCS 2: -86 dBm<br>• MCS 3: -83 dBm<br>• MCS 4: -79 dBm<br>• MCS 5: -75 dBm<br>• MCS 6: -73 dBm<br>• MCS 7: -72 dBm |
| | IEEE 802.11ac VHT20:<br>• MCS 0: -93 dBm<br>• MCS 1: -90 dBm<br>• MCS 2: -87 dBm<br>• MCS 3: -84 dBm<br>• MCS 4: -81 dBm<br>• MCS 5: -76 dBm<br>• MCS 6: -75 dBm<br>• MCS 7: -74 dBm<br>• MCS 8: -70 dBm | IEEE 802.11ac VHT40:<br>• MCS 0: -90 dBm<br>• MCS 1: -87 dBm<br>• MCS 2: -85 dBm<br>• MCS 3: -82 dBm<br>• MCS 4: -79 dBm<br>• MCS 5: -73 dBm<br>• MCS 6: -72 dBm<br>• MCS 7: -72 dBm<br>• MCS 8: -67 dBm<br>• MCS 9: -66 dBm | IEEE 802.11ac VHT80:<br>• MCS 0: -87 dBm<br>• MCS 1: -83 dBm<br>• MCS 2: -81 dBm<br>• MCS 3: -78 dBm<br>• MCS 4: -75 dBm<br>• MCS 5: -73 dBm<br>• MCS 6: -68 dBm<br>• MCS 7: -68 dBm<br>• MCS 8: -64 dBm<br>• MCS 9: -62 dBm |
| **Transmitter output power** | 2.4 GHz:<br>• 802.11b: up to 17 dBm<br>• 802.11g: up to 14 dBm<br>• 802.11n HT20: up to 13 dBm | | 5 GHz:<br>• 802.11a: up to 14 dBm<br>• 802.11n HT20: up to 13 dBm<br>• 802.11n HT40: up to 13 dBm<br>• 802.11ac VHT20: up to 12 dBm<br>• 802.11ac VHT40: up to 12 dBm<br>• 802.11ac VHT80: up to 12 dBm |
| **Antenna** | • 2.4 GHz: 2.4 dBi peak gain<br>• 5 GHz: 3.0 dBi peak gain | | |
| **Access point support** | • Cisco unified access points<br>　◦ Minimum: 8.0.121.0<br>• Cisco autonomous access points<br>　◦ Minimum: 12.4(21a)JY<br>• Cisco Meraki® access points<br>Note: Check deployment guide for more details around access point support and listing. | | |
| **Wireless security** | Authentication:<br>• Wi-Fi Protected Access (WPA) versions 1 and 2 Personal and Enterprise<br>• Extensible Authentication Protocol – Flexible Authentication via Secure Tunneling (EAP-FAST)<br>• Protected Extensible Authentication Protocol – Generic Token Card (PEAP-GTC)<br>• Protected Extensible Authentication Protocol – Microsoft Challenge Handshake Authentication Protocol Version 2 (PEAP-MSCHAPv2)<br>• Extensible Authentication Protocol – Transport Layer Security (EAP-TLS) | | Encryption:<br>• 40-bit and 128-bit static Wired Equivalent Privacy (WEP)<br>• Temporal Key Integrity Protocol (TKIP) and Message Integrity Check (MIC)<br>Advanced Encryption Standard (AES)<br>**Note:** The access point must support AES as TKIP can only be used as the broadcast/multicast cipher. |

| Item | Specifications |
|---|---|
| Fast secure roaming | • 802.11r (FT)<br>• Cisco Centralized Key Management (CCKM) |
| Signature types | • Secure Hash Algorithm 1 (SHA-1) and Secure Hash Algorithm 2 (SHA-2) |
| Bit key types | • 1024, 4028, and 4096 bit keys |
| QoS | • IEEE 802.11e and Wi-Fi Multimedia (WMM)<br>• Traffic Specification (TSPEC)<br>• Traffic Classification (TCLAS)<br>• Enhanced Distributed Channel Access (EDCA)<br>• QoS Basic Service Set (QBSS) |

**Table 3.**   Specifications

| Item | Specifications |
|---|---|
| Display | • 2.4-in. (6-cm) color display with 240 x 320 pixel resolution |
| Dimensions (HxWxD) | • 5.2 x 2.2 x 0.7 in. (13.2 x 5.6 x 1.7 cm) |
| Weight | • Device 4.4 oz (126 g), battery 1.3 oz (37 g), total = 5.7 oz (163 g) |
| Battery | • Up to 9.5 hours of voice calling; up to 45 hours (continuous scan) or up to 145 hours (auto scan) standby<br>• Rechargeable Lithium ion 4.35V, 2060mAh smart battery (minimal capacity 3.8V, 2000mAh)<br>**Note:** For voice calling, battery hours are calculated by placing a call and measuring the time it takes for the battery to completely drain. Actual battery hours may vary depending on display and keypad activity, messaging from XSI application, roaming events and scan mode, and use of a Bluetooth headset. Under normal usage when guidelines for battery in the deployment guide are followed, battery hours should cover a typical work shift of eight hours. |
| Input power | • Phone: 100 to 240 VAC, ~0.2A, and 50 to 60 Hz<br>• AC adapters (by geographical region) |
| Operating temperature | • Device: 14° to 122°F (-10° to 50°C)<br>• Battery: -4° to 140°F (-20° to 60°C) |
| Storage temperature | • Device: -22° to 140°F (-30° to 60°C)<br>• Battery: -4° to 113°F (-20° to 45°C) |
| Relative humidity | • 10% to 95% (noncondensing) |
| Vibration | • 1.5 Grms maximum, 0.1 in. (2.5 mm) double amplitude at 0.887 octaves per minute from 5-500-5 Hz sweep, and 10-minute dwell on three major peaks in each of the three major mutually perpendicular axes |
| Thermal shock | • -22°F (-30°C) 24 hours; 158°F (70°C) 24 hours |
| Altitude | • Certified for operation: 0 to 6500 ft. (0 to 2 km) |
| Endurance | • Ingress Protection IP67<br>• MIL-STD-810G Drop and Vibration procedures |
| Drop specs | • Withstand multiple drops of 6 feet on to concrete. 12 drops (6 faces, 4 edges, face and bottom) |
| Headset | • Wireless: Bluetooth SW 3.0 HW 4.0<br>• Wired: 3.5 mm stereo headphone/microphone jack |
| Connector | • Magnetic USB 2.0 On The Go (OTG) connector |

**Table 4.**   Certification and Compliance

| Item | Specifications |
|---|---|
| Safety | • UL 60950-1<br>• CAN/CSA 60950-1<br>• EN 60950-1<br>• IEC 60950-1<br>• AS/NZS 60950.1<br>• IEC 60529 (IP 67)<br>• ATEX Class I Zone 2<br>• CSA US/Canada Class I Division 2<br>• CSA US/Canada Class I Zone 2 |

| Item | Specifications |
|---|---|
| Electromagnetic Compatibility and Electromagnetic Interference (EMC/EMI) | • 47 CFR Part 15 Class B<br>• ICES-003 Class B<br>• EN 55022 Class B<br>• AS/NZS CISPR 22 Class B<br>• CISPR 22 Class B<br>• VCCI Class B<br>• EN 61000-3-2<br>• EN 61000-3-3<br>• KN 22 Class B<br>• EN 55024<br>• EN 50082-1<br>• EN 61000-6-1<br>• EN61000-6-3<br>• EN 300386<br>• EN 60601-1-2<br>• KN Immunity Series |
| Telecom | • FCC Part 68 (CFR) (HAC)<br>• NZ PTC 220 DR<br>• AS/ACIF S004 and AS/ACIF S040 (Australia)<br>• TIA 810-B and TIA 920-A<br>• Canada-CS-03-HAC |
| Radio | • USA: FCC Part 15.247 (2.4 GHz), FCC Part 15.407 (5 GHz), and FCC Part 2<br>• Canada: RSS-210<br>• Japan: ARIB STD-T66 (2.4 GHz), ARIB STD-T70, and T71 (4.9/5 GHz)<br>• ETSI: EN 300.328 (2.4 GHz) and EN 301.893 (5 GHz)<br>• Australia and New Zealand: AS/NZS 4268<br>• Singapore: IDA TS SRD<br>• Hong Kong: HKTA1039 |
| RF exposure | • OET-65C (01-01)<br>• ANSI C95.1 (91)<br>• RSS-102<br>• ACA Radio Communications (Electromagnetic Radiation - Human Exposure) Standard 2003<br>• EN 50360<br>• EN 301489-1<br>• EN 301489-17 |

## Ordering Information

**Note:** All Cisco IP phones require the purchase of a phone technology license, regardless of the call protocol being used.

Tables 5 provide ordering information for the Cisco Wireless IP Phone 8821-EX.

**Table 5.** Product Ordering Information

| Item | Specifications |
|---|---|
| CP-8821-EX-K9-BUN | Cisco Wireless IP Phone 8821-EX World mode, battery, power cord, power adapter, and country clip |
| CP-8821-EX-K9= | Cisco Wireless IP Phone 8821-EX World mode device ONLY |
| CP-BATT-8821= | Cisco Wireless 8821 Battery ONLY |
| CP-PWR-8821-NA= | Cisco Wireless 8821 Power Supply for North America, includes power cord and power adapter |
| CP-PWR-8821-AR= | Cisco Wireless 8821 Power Supply for Argentina, includes power cord, power adapter, and country clip |
| CP-PWR-8821-AU= | Cisco Wireless 8821 Power Supply for Australia, includes power cord, power adapter, and country clip |

| Item | Specifications |
|------|----------------|
| **CP-PWR-8821-BZ=** | Cisco Wireless 8821 Power Supply for Brazil, includes power cord, power adapter, and country clip |
| **CP-PWR-8821-CE=** | Cisco Wireless 8821 Power Supply for Europe, includes power cord, power adapter, and country clip |
| **CP-PWR-8821-IND=** | Cisco Wireless 8821 Power Supply for India, includes power cord, power adapter, and country clip |
| **CP-PWR-8821-KR=** | Cisco Wireless 8821 Power Supply for Korea, includes power cord, power adapter, and country clip |
| **CP-PWR-8821-JP=** | Cisco Wireless 8821 Power Supply for Japan, includes power cord, power adapter, and country clip |
| **CP-PWR-8821-SW=** | Cisco Wireless 8821 Power Supply for Switzerland, includes power cord, power adapter, and country clip |
| **CP-PWR-8821-UK=** | Cisco Wireless 8821 Power Supply for UK, includes power cord, power adapter, and country clip |

**Note:** For information about the desktop charger, multicharger, and carrying cases, refer to the **Cisco Wireless IP Phone 8821 Accessory Guide**.

## Warranty

Cisco IP phones are covered by a Cisco standard 1-year replacement warranty. A Cisco Smart Net Total Care™ optional service agreement is available for the Cisco Wireless IP Phone 8821-EX, desktop charger, and multicharger only, not for other accessories, such as batteries and carrying cases. The 8821-EX battery has only a 90-day warranty.

## Guidelines

- This product is not a medical device and may use an unlicensed frequency band that is susceptible to interference from other devices or equipment.
- A moist cloth can be used for simple cleaning. For the healthcare environment, Caviwipes and Saniwipes are the popular recommended choice for thoroughly cleaning the phone. Caviwipes and Saniwipes contain up to 17 percent isopropanol. Any cleaning solution containing a higher degree of isopropanol, including pure isopropanol, or an alternate alcohol-based liquid, could potentially damage the phone. Refer to the Cisco Wireless IP Phone 8821 User Guide for detailed instructions.
- Carry cases can help protect the phone and provide drop protection.
- The Cisco Wireless IP Phone 8821 was tested under controlled laboratory conditions with a rating of IP67 under IEC standard 60529. Splash, water, and dust resistance are not permanent conditions, and resistance might decrease as a result of normal wear. Users are expected to take care of the Cisco Wireless IP Phone 8821 and should not deliberately expose the device to a hostile environment of dust, splash, or water immersion. Do not attempt to charge a wet Cisco Wireless IP Phone 8821 or dock it on a desktop or multicharger. Refer to the Cisco Wireless IP Phone 8821 User Guide for cleaning and drying instructions. Liquid damage to the Cisco Wireless IP Phone 8821 is not covered under warranty.
- Use only batteries that are approved by Cisco. Use of unapproved batteries might be dangerous, and will invalidate the warranty on your phone.

## Cisco Unified Communications Services and Support

Using the Cisco Lifecycle Services approach, Cisco and its partners offer a broad portfolio of end-to-end services to support the Cisco Unified Communications system. These services are based on proven methodologies for deploying, operating, and optimizing IP communications solutions. Initial planning and design services, for example, can help you meet aggressive deployment schedules and reduce network disruption during implementation. Operate services reduce the risk of communications downtime with expert technical support, and optimize services enhance solution performance for operational excellence. Cisco and its partners offer a system-level service and support approach that can help you create and maintain a resilient, converged network that meets your business needs.

## Cisco Capital

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