

NetLink Wireless Telephones FAQ

Wireless IP Telephony for the Enterprise

Product Specifications

What are NetLink Wireless Telephones?

NetLink Wireless Telephones are mobile handsets for enterprise use, which provide high quality voice communications throughout the workplace using voice over IP (VoIP) technology. NetLink Wireless Telephones operate over an 802.11b wireless LAN, giving users the freedom to roam throughout the workplace while providing all the features and functionality of a traditional or IP-based telephone switch.

Which telephone systems do the NetLink Wireless Telephones support?

NetLink Wireless Telephones are designed to integrate with both traditional PBX telephone systems and IP-based telephony servers, allowing a simple migration path for enterprises that change their telephone switching architecture. For applications using traditional enterprise PBX systems, the NetLink Telephony Gateway connects to the host telephone switch using digital or analog line interfaces. The NetLink Telephony Gateway provides the IP conversion and packetization of the voice and control signals from the PBX. The NetLink Wireless Telephones also support standard and proprietary IP protocols for end-to-end IP telephony applications. The handsets serve as IP end-points, eliminating the need for a separate VoIP gateway.

How do NetLink Wireless Telephones compare to the Link Wireless Telephone System?

From the end user's perspective, NetLink Wireless Telephones provide the same functionality and quality as the Link Wireless Telephone System™ (Link WTS). The choice between the two SpectraLink solutions is based on the customer's infrastructure and management preferences. NetLink Wireless Telephones allow telecom and IT managers to simplify their wireless infrastructure by combining voice and data applications on the same network. Customers are able to leverage their investment in 802.11 wireless LANs and preserve their investment in traditional or IP PBX technology. Because 802.11 is an international standard for wireless LANs, NetLink Wireless Telephones can be the choice for wireless telephony throughout the global enterprise. The Link WTS remains the economical choice for customers who need to implement a voice-only wireless solution.

What is the NetLink Telephony Gateway?

The NetLink Telephony Gateway allows NetLink Wireless Telephones to interface to analog or digital station ports on a telephone switch. It converts individual voice circuits on the PBX to IP packets on the LAN. Each NetLink Telephony Gateway supports either 16 analog or digital ports (refer to the *Telephone Switch Interface Matrix* for details on the digitally supported switches). Up to 40 NetLink Telephony Gateways can be combined in a network to support a maximum of 640 NetLink Wireless Telephones.

What is the NetLink SVP Server?

The NetLink SVP Server is a dedicated network appliance that works with the wireless LAN access points to guarantee QoS by utilizing the SpectraLink Voice Priority (SVP) protocol. The NetLink SVP Server inserts the proper header information into voice packets to trigger SVP prioritization in the access points. All call setup and audio packets are routed through the NetLink SVP Server. Once the 802.11e QoS standard replaces SVP, the NetLink Wireless Telephones can be upgraded and the NetLink SVP Server can be removed from the system.

What is the maximum number of NetLink Wireless Telephones per network?

Each NetLink Telephony Gateway can support 16 users and eight simultaneous calls. Up to 40 Telephony Gateways can be used in conjunction with a NetLink SVP Server on a network, maximizing the system at 640 users and 120 simultaneous calls. When utilizing a native IP protocol interface, the number of simultaneous calls supported by the SVP Server is 80, which is sufficient for 300 to 600 NetLink Wireless Telephones depending on usage requirements.

Do the NetLink Wireless Telephones support text messaging?

NetLink Wireless Telephones support SpectraLink's Open Application Interface (OAI). The OAI enables third-party messaging applications to write to the handset display, giving users the ability to view and respond to alphanumeric messages. The NetLink OAI Gateway connects to the application server either through a serial port or through the Ethernet network.

Standards Compliance

What is the 802.11 standard?

The 802.11 specification is an international standard for wireless LANs approved by the Institute of Electrical and Electronics Engineers (IEEE) in 1997. The 802.11 standard, also known as wireless Ethernet, defines the physical (PHY) and media access control (MAC) requirements for all devices on a wireless LAN. The 2.4 GHz PHY is defined as operating in the 2.400-2.483 GHz band using either frequency hopping or direct sequence spread spectrum radio technology. The MAC defines how packets access the wireless media. This method is known as Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA). NetLink Wireless Telephones are available for either frequency hopping or direct sequence networks.

What is the 802.11b standard, and do NetLink Wireless Telephones support it?

The 802.11b standard was added in 1999 defining a new physical layer at 2.4 GHz supporting data rates up to 11 Mb/s. The NetLink e340 and i640 Wireless Telephones support the 802.11b standard.

What is 802.11e?

The 802.11e specification under development by the IEEE standards committee addresses Quality of Service (QoS) issues on wireless LANs. SpectraLink and their 802.11 technology partners will adopt the new specification once it is ratified in late 2003 or early 2004. This standard will gradually replace SVP, providing the same functionality in an industry standard and ensuring high-quality voice in a mixed-client environment. SpectraLink is actively working within the IEEE 802.11e committee to ensure success of this enhancement.

What is the 802.11a standard, and do NetLink Wireless Telephones support it?

The 802.11a standard is a physical layer specification operating at 5 GHz and supporting data rates up to 54 Mb/s. Since 802.11a uses a different frequency band, it is not compatible with 802.11b. NetLink Wireless Telephones are not compatible with 802.11a networks. However, most enterprise wireless LAN implementations are using 802.11b exclusively or dual-radio access points supporting both 802.11b and 802.11a.

What is Wi-Fi, and are NetLink Wireless Telephones compatible with it?

Wi-Fi is the term originally coined by the Wireless Ethernet Compatibility Alliance (now the Wi-Fi Alliance) to give a more “market-friendly” name to 802.11b technology and networks. Wi-Fi is now used to describe both 802.11b and 802.11a networks. NetLink Wireless Telephones are compatible with any 802.11b Wi-Fi access points that also utilize SVP.

Are NetLink Wireless Telephones compatible with 802.11g?

802.11g is the standard for adding higher data rate support in the 2.4 GHz band. Part of the standard requires that all 802.11g devices be backward compatible with current 802.11b devices. Therefore, NetLink Wireless Telephones using the 802.11b standard will be compatible with 802.11g networks.

Do NetLink Wireless Telephones support the H.323 standard?

H.323 is an International Telecommunications Union (ITU) standard developed for video/audio conferencing that has been adopted by several VoIP vendors for call setup and signaling. NetLink Wireless Telephones can use H.323 for basic call capabilities. For a more feature-rich implementation, the NetLink Wireless Telephones can use proprietary IP protocols or operate in conjunction with a NetLink Telephony Gateway to access features from a traditional PBX

Security

Is the voice conversation secure? Does it use encryption?

NetLink Wireless Telephones support Wired Equivalent Privacy (WEP) encryption as defined by the 802.11 standard. The handsets can use either 40-bit or 128-bit key lengths. WEP is intended to provide the same level of security over a wireless LAN as on a wired Ethernet LAN.

Does SpectraLink support 802.1x based security provisions like EAP-TLS or LEAP?

SpectraLink has evaluated a number of the new proprietary security methods. These advanced methods require a back-end authentication server to authenticate users and generate new keys. This authentication and re-keying process can take up to several seconds and is required each time a user roams from one access point to the next. While this is taking place, the Wireless Telephone is not associated to an access point and there is an interruption in the voice transmission. This delay in the authentication process is unacceptable for a voice conversation.



What is SpectraLink doing to address security concerns related to the vulnerability of WEP?

SpectraLink has partnered with leaders in the 802.11 security sector to provide our customers with alternatives to WEP. Currently the NetLink Wireless Telephone System has been tested for compatible with the ReefEdge and BlueSocket wireless LAN security appliances. Both of these products offer robust security, mobility, and management options for wireless LANs. Another near-term security solution is to utilize a separate VLAN for voice applications, allowing different levels of security to be implemented for data applications.

Does SpectraLink plan to support the 802.11i standard?

The 802.11i standard will address the security weaknesses identified with current wireless LAN implementations. SpectraLink is committed to industry standards and will work to be among the first to implement the 802.11i security standard. SpectraLink is represented on the IEEE 802.11i committee and is active in helping move this important standard to completion.

Do NetLink Wireless Telephones support WPA?

WPA (Wi-Fi Protected Access) is an interim security solution endorsed by the Wi-Fi Alliance. It incorporates much of what is expected to be part of the 802.11i security standard. SpectraLink is fully committed to meeting the 802.11i standard, and is currently evaluating the feasibility of supporting WPA as an interim solution.

Network and Wireless LAN Considerations

What are the network requirements to deploy NetLink Wireless Telephones?

A site must be equipped with SVP-compliant access points. The access points (APs) must provide coverage in all areas where voice service is expected. The network must utilize 10/100 Base-T switched Ethernet with the APs connected to switch ports, as Ethernet hubs will have negative effects on voice quality.

How much bandwidth does a NetLink Wireless Telephone use?

When not in an active call, a NetLink Wireless Telephone uses the same amount of bandwidth as any idle 802.11 client device. When in a telephone call, the bandwidth utilized varies depending on the transmission data rate and the type of voice encoding used. For example, a call using standard 64 kb/s voice encoding (G.711) utilizes about 4.5% of the AP bandwidth at 11 Mb/s and about 12% at 2 Mb/s. Note that about 30% of the AP bandwidth is needed for re-sending packets and dynamic channel allocation, so that only 70% of the AP bandwidth is available for NetLink Wireless Telephones and other client devices.

How many NetLink Wireless Telephone calls can an access point support?

The number of simultaneous calls supported by an access point depends on the data rate, the voice encoding algorithm, protocol overhead, and performance of a specific manufacturer's AP. In general, approximately twelve simultaneous calls are possible if all twelve are operating at 11 Mb/s. Recognizing that in many cases the NetLink Wireless Telephone may be operating at a lower data rate, depending on the location of the user relative to the AP, SpectraLink uses the 2 Mb/s rate to provide a conservative estimate of call capacity that is independent of the actual customer environment. Refer to the *SpectraLink Voice Priority Compliance Matrix* for information about the number of calls supported on specific SVP-enabled access points. The network administrator can set the maximum number of simultaneous voice calls over a single access point, thus preserving bandwidth for data applications.

How are the NetLink Wireless Telephones managed on the network?

NetLink Wireless Telephones are as simple to administer and maintain as any other client on a wireless network. Each NetLink Wireless Telephone requires an IP address, which can be statically assigned or provided by a DHCP server. NetLink Wireless Telephones also include a TFTP client, allowing automatic software updates from a local TFTP server.

Can an active call be maintained while roaming between LAN subnets?

No. SVP timing between the NetLink SVP Server and the access points requires minimal delay between the devices, so the SVP Server must be on the same subnet as the access points. If multiple subnets are used, then each must have its own SVP Server and the user needs to re-initialize the NetLink Wireless Telephone in order to operate on a new subnet.

What is the range of the NetLink Wireless Telephones?

The range of the radio in a NetLink Wireless Telephone handset varies according to a number of factors, including internal wall construction, obstructions, AP output power, and RF transmission type (FH or DS). Also, range varies by AP vendor. Considering all of these variables, the range in a given customer environment can vary significantly. However, in laboratory tests the typical indoor range between a NetLink Wireless Telephone and AP is approximately 150 to 200 feet.

Frequently Asked Questions

Does adding NetLink Wireless Telephones to a wireless LAN require more access points?

Like any client devices, adding NetLink Wireless Telephones to a wireless LAN increases the bandwidth requirement because of the increase in traffic load. A lightly loaded wireless LAN may not require additional APs. However, on a moderately to heavily loaded wireless LAN or where additional coverage area is needed, additional APs may need to be installed.

SpectraLink Voice Priority (SVP)

Can voice and data packets be transmitted across the wireless network at the same time?

Because all devices need to be compatible with the 802.11 standard, they are able to communicate in the same wireless network. However, when data and voice are competing for bandwidth it is necessary to have a prioritization method, such as SVP, that provides a controlled preference to voice.

How is voice quality ensured on a shared network?

SpectraLink Voice Priority (SVP) is SpectraLink's open mechanism for quality of service (QoS) on 802.11 networks. Adopted by the leading wireless LAN vendors, SVP guarantees audio quality in a shared voice and data network. The NetLink SVP Server, Telephony Gateway, Wireless Telephones, and wireless LAN access points work together to provide the clearest voice quality and the flexibility to manage radio bandwidth. SpectraLink Voice Priority is an open specification that is fully compliant with 802.11 standards.

Are SVP-compliant access points required if the wireless LAN is being used only for voice?

SVP is required to ensure the timing and delivery of packets. Without a method of prioritization for voice packets, the lack of a controlled delivery method will result in poor audio quality, even with only voice devices on the network.

If voice has priority, what happens to data traffic?

Data packets may be delayed due to voice traffic on the network, but these delays are no different from delays caused by additional data traffic. If it is necessary to guarantee a minimum amount of bandwidth for data applications, SVP allows a network administrator to set the maximum number of simultaneous voice calls over a single access point. A call will not handoff to an access point that is carrying the maximum number of sessions, but will handoff to other nearby access points. By limiting the number of active voice calls per access point, voice quality is ensured and a guaranteed portion of bandwidth is reserved for data.

Which wireless LAN vendors have implemented SVP?

SpectraLink has established technology partnerships with leading enterprise wireless LAN vendors, including Alvarion, Avaya, Cisco, Enterasys, Intermec, Proxim and Symbol. The technology alliance consists of a cooperative engineering effort, ensuring product interoperability and high performance along with implementation of SpectraLink Voice Priority (SVP) into the manufacturer's access points.

