NOKIA A032

FREQUENTLY ASKED QUESTIONS

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FAQ

Q. Is the Nokia A032 Wireless LAN Access Point Compliant with Industry Standards?

A. Yes. The Nokia A032 is fully compliant with the IEEE 802.11b standard.

Q. What are the differences between IEE802.11a, IEE802.11ab and IEE802.11c?

A. IEEE802.11a defines the standard for 6.5Mbs Wireless LAN at 5Ghz bandwidth using OFDM. It is a future development and is not currently on the market.

IEEE802.11b defines the standard for 11Mbs Wireless LAN currently in use. It is the standard used in the Nokia A032 access point at the 2.4Ghz bandwidth using DSSS.

IEEE802.11c is the addendum to the 802.1d MAC bridging standard for 802.11 ports.

Q. Is the Nokia A032 Wireless LAN Access Point interoperable with other manufacturer's wireless LAN products?

A. Nokia WLAN products are IEEE 802.11b compliant and are compatible with any product that is also IEEE 802.11b compliant.

The Nokia A032 also bears the WiFi logo of interoperability. The WiFi logo is significant in that it certifies interoperability between equipment from different vendors bearing the logo.

Q. How many users does one Nokia A032 Access Point support?

A. The Nokia A032 can concurrently support a maximum of 253 users. The number of users is dependent on the network load, for a heavy load it is recommended that the average number of mobile users be between 4 and 8. For a light load it is recommended that the average number of mobile users be between 15 and 25.

Q. What is the maximum data rate supported by the Nokia A032?

A. The Nokia A032 has a maximum data rate of 11Mbps.

Q. Can a wireless LAN contain both 2Mbps and 11Mbps Wireless stations?

A. Yes. The Nokia A032 supports 1, 2, 5.5 and 11Mbps.

Q. How is Network efficiency affected when there are both 2 and 11Mbps wireless stations on the same network?

A. There are 3 things that affect the efficiency of the network.

1. Broadcasts from the Access Point are transmitted at the highest speed that can be received by all wireless stations in the network, therefore all broadcasts will be at 2Mbps.

2. The 2Mbps wireless station should see the headers of packets sent by 11Mbps wireless stations and not transmit, there may be occasions when these packets are not detected and collisions occur.
3. If there is a lot of traffic for/from the 2Mbps wireless stations this will impact on the efficiency of the whole network.

Each network will be affected differently depending on the amount of traffic to 2Mbps wireless stations/network broadcasts and collisions but overall the effect should be minimal.

Q. Will the Nokia A032 work with a 2Mbps radio card inserted?

A. No. The Nokia A032 is designed to work only with the Nokia C110 and C111 radio cards.

Q. Can another vendor’s radio card be used in the Nokia A032 Access Point?

A. No. The Nokia A032 is designed to work only with the Nokia C110 and C111 radio cards.

Q. When there is noise on the channel, at what level of 'noise' power does the Access Point think the channel is in use?

A. The Access Point looks for Direct Sequence Spread Spectrum signal and is not bothered about RF energy (noise). Any noise that is on the channel that is not Direct Sequence Spread Spectrum will be ignored and will be transmitted over.

Q. What collision detection mechanisms are used in the Wireless LAN?

A. The access point implements IEEE802.11b which provides mechanisms for collision avoidance. There is no provision for collision detection - generally collision detection is not practical with wireless systems due to the fact that it is effectively impossible to receive and transmit at the same time on the same (or close) antennas.

Q. What is roaming?

A. Roaming is defined as the ability of a wireless station to locate and connect to an access point automatically and then to transfer the connection to another access point (having the same network name) without user intervention. Roaming is described as seamless when the transfer occurs so quickly that the user is unaware that a transfer has occurred.

Q. What happens when a wireless station roams?

A. When a wireless station roams from one Access Point to another, the radio link is ‘break-before-make’ but on a TCP level there is no break at all. If a wireless station moves from Access Point 1 to Access Point 2 it disassociates with Access Point 1 then associates with Access Point 2 with no break in the TCP task. This assumes that the access points are attached to the same Physical Wired LAN.

Q. Can the Nokia A032 Access Point be upgraded?

A. The firmware and BIOS can be upgraded via the serial port with a null modem cable. The firmware can also be upgraded via TFTP.

Q. Is there any radio hardware in the Access Point?

A. Some people consider that the access point includes the radio by definition. All radio hardware is in the wireless LAN card, which is connected to the Access Point.

Q. Can access to specific web sites be restricted?

A. Access to Specific web sites cannot be restricted via the access point, this can be done by the installation of 3rd party software onto the wireless stations.

Q. Can the speed of the network be fixed to 11Mbps?

A. Yes. The basic rate parameter can be fixed at 11Mbps. In this mode, all the management traffic will be done at 11Mbps and a 2Mbps wireless station will not be able to associate with the Access Point.

Q. So 2Mbps wireless stations can be stopped from associating with the Access Point but will all the traffic be transferred at 11Mbps when the basic rate is fixed to 11Mbps?

A. 11Mbps traffic is more sensitive to interference so although all the multicast/broadcast frames are sent at 11Mbps (because the basic rate is fixed). Dependant on configuration, direct data traffic may be sent at a much lower speed to ensure delivery, sometimes the throughput is better using 2Mbps rather than 11Mbps in adverse conditions.

Q. How can communication reliability be improved when a large amount of data is sent across a network?

A. There are several features built in to improve communication reliability.

1. The transmitted data is broken down into fragments, the fragment size is inclusive of the header and CRC bytes. The fragments are sent separately and reassembled at the other end. The size of these fragments can be manually configured using the clm command *frag_threshold*. The default setting is the maximum fragment size of 2346 bytes. If the fragment threshold is set below the RTS threshold the RTS threshold becomes redundant.
2. Any fragment/frame which is smaller in size than the rts_threshold is sent directly, any fragment/frame which is larger in size than the *rts_threshold* initiates a RTS/CTS (Request To Send/Clear To Send) sequence. This sequence reserves the airtime so that no collisions occur when a large frame is sent. The *rts_threshold* value can be configured to optimise the efficiency on the network. RTS/CTS is particularly important in networks were wireless stations cannot hear each other only the Access Point, in these cases the RTS threshold should be low.
3. The parameters *long_retry* and *short_retry* control the number of times a frame is transmitted without an Acknowledgement being received within the timed out period. These values can be configured to improve efficiency under certain conditions.

Q. How do I determine whether to use the long_retry or short_retry for unacknowledged frames?

A. The *short_retry* value determines how many times the frame is sent (in total) without an ACK being received for frames smaller than the *rts_threshold* value. The *long_retry* value determines how many times the frame is sent (in total) without an ACK being received for frames larger than the *rts_threshold* value. The reason there are two parameters is because the bigger frame takes longer to transmit plus the overhead of the RTS/CTS. The total number of long frame retries can be changed to make the network more efficient.

Q. What are the maximum and minimum values that can be used for frag_threshold and rts_threshold?

A. The maximum value for rts_threshold is 2347+MAC header, this is based on the MPDU size. The minimum value is 0, which means any frame transmitted will be preceded by a RTS/CTS. It is not recommended that the rts_threshold be set to 0 because of the overheads this incurs.

Q. During the connection setup the AP erases the user name and password and it is not possible to connect

A. Using the Web Management screens: After entering the information in the appropriate fields the Enter button must be clicked and the Access Point must be restarted (clicking the Save button).

Using Telnet: The Access Point must be restarted using the clm command 'restart'. The Access Point will not change the information if these procedures are not carried out.

Q. How is the Point Coordination Function implemented?

A. All IEEE802.11 compliant stations must support the Distributed Coordination Function (DCF). DCF provides a "first come first served" mode of operation with collision avoidance techniques. As an option, IEEE802.11 stations can also implement the priority based Point Coordination Function (PCF). When operating in PCF modes, the access point is able to coordinate network operations by polling the stations in turn.

The PCF can be used for the transmission of time-bounded information such as audio and video or simply to give some stations higher priority. Using PCF imposes greater overheads on the network due to the transmission of polling frames.

The Access Point supports PCF but each individual station makes the choice as to whether it will communicate using PCF or DCF mode. Often this will be a configuration parameter in the wireless station.

Q. If more than one wireless station has PCF implemented in what order are the wireless stations polled?

A. The standard specifies that the wireless stations using PCF are polled order of association using the AID (Association ID) which is generated for each wireless station when it associates.

Q. Can WEP and a NID list be implemented on the same Network?

A. Yes, the NID list and the WEP sub-systems operate independently. Generally the use of WEP keys is preferable and more secure than the NID list. However, in a mixed environment of WEP and non WEP devices both the NID List and WEP functions can be operational.

Q. What is the maximum number of bridge entries that can be configured on the Nokia A032?

A. The maximum number of bridge entries is 200 therefore theoretically the access point can be a bridge partner with up to 200 other access points.

Q. How does the sifs_time parameter enhance the performance of the Nokia A032?

A. The sifs_time is the minimum response time between receiving a data frame and transmitting the acknowledgement. It is defaulted to 10ms in the Nokia A032 which gives a range of approximately 1.5Km.

The sifs_time parameter can be increased to improve the distance of the access point, this distance can be calculated using the equation

$$Dist = \frac{c * sifs\_time}{2}$$

Q. Why does the WEP Enable button not change color to show it has been activated when I have chosen it in Learn Mode?

A. When the WEP enable button is chosen in learn mode it automatically moves the user down the screen to the WEP Settings. This allows the user to enter a valid key, only when a valid key has been entered will the WEP Enabled button change to red to show it is activated. This ensures that the user configures the access point.

Q. How does the access point behave when it is in Learn Mode?

A. Learn Mode is intended to allow the user to configure the unit without the use of a serial cable, even when the access point does not have a valid IP address or if the access point is in a default state with WEP Mode set to WEP.

The main differences from normal mode are –

- Change in behavior of front panel LED's(now in chasing pattern)
- Enables the 'set to default' feature (by pressing and holding button again)
- Change in home page of Web management screens to Learn Mode configuration screen
- Forces web and telnet functions to default to TCP ports (80 and 23) regardless of settings
- Disables specific manager function and allows any manager to access set-up functions

If there is a radio card in the access point the following behavior also occurs

- The Ethernet LAN Interface is disabled
- If no IP address is assigned the access point is set to 192.168.5.100
- Sets DHCP on the address range starting one higher than its IP address and including 31 addresses
- Responds to ARP requests regardless of target IP address
- Accepts IP data-grams regardless of target IP address
- Set WEP Mode to Open

If there is no radio card in the access point the following behavior also occurs

- The radio interface is disabled
- The ‘Learn IP from network’ feature is enabled

Q. How does the Learn IP from network feature work?

A. If the access point does not already have an IP address assigned it can be put into Learn Mode to take advantage of the ‘Learn IP from network’ feature. The access point monitors the Ethernet for ARP requests. If it sees three ARP requests with no reply within a fifteen second period it will adopt the target IP address and configure itself with the address.

The most effective way of configuring the access point using this function is to 'ping' an address that you wish the access point to adopt. The access point will ignore the first three requests and then starts to respond and the chasing pattern on the LED’s stops. When the access point is restarted it will have adopted the IP address. The access point will not adopt another IP address if it already has one.