Product Bulletin

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Nortel WLAN Handset 6100 Series Portfolio

Date	Revision #	Summary of Changes
20th June 2007	Original bulletin	This is the original publication
23rd May 2008	Revision 1	Updated to reflect Maintenance and Enhancement Releases

Introduction

Nortel* is pleased to announce the General Availability (GA) of the WLAN Handset 6100 Series portfolio as of June 20th 2007. This product release introduces fully featured, state-of-the-art WLAN Handset 6120 (intermediate–level), WLAN Handset 6140 (professional-level), along with associated chargers, batteries and accessories. The new WLAN Handset 6100 Series offering interoperates with the current range of WLAN Handset 2200 Series products (including the WLAN IP Telephony Manager 2245 and WLAN Applications Gateway 2246) but requires software upgrades on these products.

The new Nortel WLAN Handset 6100 Series models (6120 and 6140) work within a mixed system with the current Nortel WLAN Handsets 2210/2211/2212. At time of releasing Version 2 of this bulletin, Nortel would like to announce the impeding retirement of the WLAN Handset 2211 and the WLAN Handset 2212 range of products as these products are effectively replaced by the WLAN Handsets 6120 and 6140. The WLAN Handset 2210 will continue to be offered at this time. More information on this retirement will be detailed in a dedicated bulletin.

Compatibility with call servers and required patches are shown below. The WLAN Handset firmware can be downloaded from the Nortel Technical Support website (instructions later in this document).

The WLAN Handset 6100 Series of products are now compatible with most Nortel call servers including: CS 1000, CS 2000 and CS 2100; Business Communications Manager (BCM) and Survivable Remote Gateway (SRG) platforms.

The offering is not supported on older software releases of CS 1000 prior to Release 4.5. For more information on compatibility and any required patches, please refer to Section "Call Server Compatibility, Requirements, and Advisements"

Contents:

New Features

The WLAN Handset 6100 Series builds upon the capabilities of the WLAN Handset 2200 Series with enhanced features, including wireless hardware-based capabilities (IEEE 802.11 a/b/g radio), larger backlit display, expanded Push-to-Talk channels (WLAN Handset 6140), extended capacity battery options as well as new accessories. A description of the handsets features is discussed as follows.

General Attributes

There are two new handset models being introduced: the Nortel WLAN Handset 6120 as an intermediate-level set and the Nortel WLAN Handset 6140 as a professional-level set.

Parameter	**Nortel WLAN Handset 6120**	**Nortel WLAN Handset 6140**
Physical dimensions (Imperial)	5.4” x 2.0” x 0.9”	5.7” x 2.0” x 0.9”
Physical dimensions (Metric)	137mm x 51mm x 23mm	145mm x 51mm x 23mm
Weight with Standard Battery Pack	4.0 oz (12.5g)	4.4 oz (123.7g)
Weight with Extended Battery Pack	4.2 oz (13.1g)	4.6 oz (14.3g)
Weight with Ultra-Extended Battery Pack	4.6 oz (14,3g)	5.0 oz (15.6g)
Push-to-Talk (PTT)	No	Yes
Drop specification	MIL-STD-810F	MIL-STD-810F

Both WLAN Handset models work with the current portfolio of WLAN Handset 2200 Series products including the WLAN IP Telephony Manager 2245 and the WLAN Applications Gateway 2246.

- As per the current handsets, the WLAN Handset 6120 and WLAN Handset 6140 provide the highest level of wireless security with support for WPA-PSK, WPA2-PSK, WEP, or Cisco FSR options
- As per the current handsets, the WLAN Handsets 6120 and WLAN Handset 6140 provide wireless Quality of Service with either 802.11e-based Wireless Multimedia (WMM) or SpectraLink Voice Prioritization (SVP) options

Images of the new Nortel WLAN Handset 6100 Series models are shown below:

Nortel WLAN Handset 6120
An intermediate-level set designed for general office and management staff and providing a reliable option for front-line personnel in high-use environments

Nortel WLAN Handset 6140
A professional-level set designed for distributed work teams requiring instantaneous communication, and/or working in high noise environments

Ergonomics and User Interface

The Nortel WLAN Handset 6100 Series models have been designed to mimic the Nortel IP Phone 1100 Series desk set offering from both an operation viewpoint and in appearance:

- Reduced weight (4.0-5.0oz (12.5g to 15.6g) depending on model and battery type)
- Smaller form factor (than previous 2211 offering)
- Larger backlit display 128 x 96 pixels
- Larger ear cup compared to previous WLAN Handset 2210/2212
- Larger dedicated side volume keys
- New backlit keypad (similar to 2212)

- Improved battery removal notch
- Enhanced vibration ring (x 2)
- Common Feel with Nortel appearance and user interface
- New - User name and extension display
- New – Five user-selectable profiles: Silent; Vibrate; Loud; Soft; Custom
- New – Four-way plus “Enter” navigation key cluster
- Four discrete soft keys – common user experience with Nortel desk sets

Enhanced Durability

The Nortel WLAN Handset 6120 and WLAN Handset 6140 both conform to the new standard compliancy for dust and water resistance.

- IP 53: Resistant to dust and water damage - all surfaces to protect components from moisture.

The Nortel WLAN Handset 6120 and WLAN Handset 6140 both conform to the new standard compliancy for shock resistance.

- MIL STD 810F Proc IV 516.5: Handsets are “dropped” using a test fixture on each face, edge and corner, for total of 26 drops, from height of 122 cm (4 ft) onto concrete

Improved Productivity

The Nortel WLAN Handset 6120 and WLAN Handset 6140 both offer handsfree operation with a built-in speakerphone for both normal office use and for adhoc conferences.

- Partial-duplex quality speakerphone for handsfree operation
- Designed with workplace functionality in mind
- Stands vertically- place on desk or conference table for instant ad-hoc conferences

The WLAN Handset can also be used while in the charger using a headset or via the integrated speakerphone. This ensures continued communication while charging and also is suitable for longer desk bound calls.

Extended Push-to-Talk capability

Significant improvements have been made in the Push-To-Talk (PTT) functionality with the WLAN Handset 6140 model in response to customer feedback:

- Enhanced Push-To-Talk operation (new menu and channel subscription options)
- Up to 24 channels now available
- Change PTT channel with ease
- New dedicated “priority override” channel

- Assign text names to channels
- WLAN Handset 6140 is compatible with first eight PTT channels used with the WLAN Handset 2211

Expanded Radio Connection

The WLAN Handset 6100 Series models are now compatible with current WiFi standard IEEE 802.11a/b/g radio spectrums as follows:

- Handsets support IEEE 802.11a: 54 Mbps operation in the 5 GHz band with support for transmit power control (TPC) and dynamic frequency selection (DFS) for conformance with FCC and European regulatory
- Handsets support IEEE 802.11g: 54 Mbps operation in the 2.4 GHz band; they also support the current IEEE 802.11b: 11 Mbps operation in the 2.4 GHz band
- Handsets also support a mixed 802.11b/g mode.

Having the choice of WLAN frequencies allows the system to be deployed in several options:

- Choice of running all traffic over single media 802.11a, or 802.11g, or 802.11b/g mixed mode
- Choice of running data on one frequency and voice on the other
- Placing voice on 802.11a provides higher desnsity
- Placing voice and/or data on 802.11a provides greater immnity to interference

- Devices working in the 802.11a spectrum are less susceptible to harsh RF environments

Deployment Recommendation for networks with WLAN Handsets 6100 Series

Recent radio testing carried out on Nortel WLAN Handsets 6100 series against like competitive products has resulted in confidence that Nortel WLAN Handsets have superior radio performance in the circumstances tested. Tests concentrated on RSSI measurements and handset behavior at cell edges where in typical environments Nortel handsets would operate at lower RSSI levels and at a further distance from access points than the competitive products tested. Walking out of the coverage, the Nortel handset would hold the call for a short time, such that walking back into coverage would result in reconnection to the same call.

Having gained this confidence in the product's performance, it is still Nortel's recommendation that a proper site survey be done and that sites should typically be deployed at an RSSI level of -60dBm. This will ensure a proper operating environment resulting in the end user experiencing a high quality of voice call. At the same time deployment at this level provides contingency for any future changes and possible interference in the environment occurring after the survey.

Some sites have opted to use -67dBm as the deployment level which is also fully supported by Nortel, however this should be coupled with a Signal-to-Noise Ratio (SNR) of 25dB or more; and care should be taken that at each possible handset location this level of signal strength should be present throughout the coverage area.

It is Nortel's recommendation that a site survey is carried at each site prior to installation or prior to sale in order to determine the preferred positioning of Access Points to provide the required coverage throughout the site.
Bear in mind that sites previously deployed for data networks may not be suitable for voice and data. Sites surveyed for 802.11b radios will not necessarily be suitable for 802.11a or g deployment.

Nortel has added a portfolio of Site Survey and Deployment Services under its "Service Express" brand that are available for order through the ESQ quotation tool and which will provide high quality site survey, deployment and installation services to Nortel's' channels.

Other Aspects

Additional WLAN Handset 6100 Series features include:

- Personal phone directory; corporate directory; virtual log-in (supported only on Communication Server 1000).
- Meets TIA 810B standard
- Meets full regulatory standards in North America; UK and Europe

- Additional regulatory approvals for other markets are in process and shipments will be allowed as soon as regulatory approvals are obtained

Retrieving an incoming call while in configuration menu

- When the user is in the configuration menu and a call arrives at the handset an icon (resembling a phone) will start flashing in the top of the screen. It is assumed that the user is looking at the display while doing configuration and therefore can see this notification. There are two ways to retrieve the incoming call from this point:-
- on seeing the flashing icon, the user can immediately press END key to exit the configuration menus and the phone will return to the idle screen and will start ringing. At this point, the phone can be answered by pressing the START key in the normal fashion.
- the configuration menu will time out in 20 seconds at which point the phone will return to the idle screen and will start ringing. Again the phone can be answered by pressing the START key in the normal fashion.

Cleaning Recommendations for WLAN Handsets 6100 Series

Wireless Telephones may occasionally need to be cleaned to maintain appearance. Generally, wiping the phone's surface with water dampened cloth or paper towel will remove most films or residues. If the soiling is too stubborn for plain water, a mild detergent solution may be used. Be sure to wipe away any detergent residue with a plain water dampened cloth.

The phone may be cleaned with any general-purpose household glass and surface type cleaner. DO NOT SPRAY THE PHONE DIRECTLY! Spray the cleaner on a soft cloth or paper towel and then wipe the phone's surface. Pre-treated cloths, like those used for eyeglasses or cameras, may be used to clean the phone. Pre-moistened towels may also be used to clean the phone, however, avoid those containing lanolin or aloe as it will leave a slippery residue.

The surface of the phone may be cleaned occasionally with disinfectants used for general cleaning in a medical environment. DO NOT DIRECTLY SPRAY aerosol disinfectants on the phone. Isopropyl alcohol may be used occasionally to clean the phone applied by a damp cloth or paper towel. Pre-moistened injection prep towels are suitable for cleaning the phone.

When using alcohol, do not rub the keypad characters vigorously as this will significantly degrade legibility. A short list of recommendations follows:-

- Do not use furniture polishes, waxes or plasticizer based cleaner
- Do not use lanolin, aloe, glycerin or other skin care type products.
- Do not apply any solvent such as acetone, mineral spirits etc.
- Do not directly spray or immerse the phone.

Should the headset connector become dirty, a scratchy or intermittent signal may be experienced. To clean the connector, dip the non-padded end of either a wooden or paper handled cotton swab in isopropyl alcohol. Gently insert in the connector and twist, repeating several times. If available, blow compressed air into the connector to clear debris.

Battery Packs

The WLAN Handset 6100 Series offering is introduced with a range of battery options to suit varying customer requirements. Batteries are common across both WLAN Handset models (6120 or 6140) as follows:

Talk and standby time are extended through a choice of Lithium-Ion Battery Packs:

- Standard:- up to 4 hours talk time
- Extended:- up to 6 hours talk time
- Ultra-Extended:- up to 8 hours talk time
- Standby times are in the process of being measured but are substantial enough to support both intensive shift working and occasional use.

Battery Type	Talk Time	Charge Time
Standard	Up to 4 Hours	Up to 2 Hours
Extended	Up to 6 Hours	Up to 3 hours
Ultra-Extended	Up to 8 Hours	Up to 4 Hours

Advice on Battery Handling for the WLAN Handset 6100 Series

The Nortel WLAN Handset 6100 Series battery packs are produced from a lithium-ion cell chemistry designed to maintain a long service life provided optimal charging practices are followed.

As with other rechargeable Lithium-ion-based products, Nortel WLAN Handset battery packs should not be stored or kept idle for an extended period of time, rather they should be cycled at regular intervals to ensure they maintain the expected lifetime. Battery management is an inexact science but Nortel provides the following advice:-

- The Li-ion batteries used in the 6100-series handsets have a 'Protection Circuit Module' which disconnects the power cells from the external connectors when the cell's power falls below a certain threshold, therefore long term storage without a maintenance charge within the warranty period should not affect the long term performance of the battery. However, if a battery pack is stored for more than five months it is still recommended to have a periodic maintenance charge if possible, to maintain optimal performance.

- Battery packs must be fully charged before first use. The first battery pack charge after prolonged storage usually yields a lower capacity than normal and the battery capacity should improve over the next few charge/discharge cycles.

- Recommend full discharge, until the 'Low Battery' message appears on the handset, approximately every 30 days. The Protection Circuit Module will prevent any damage to the battery from full discharge.

- Philosophy with Li-on batteries should be to place a handset on its charger when not being used. Charge batteries after each use without regard to 'Discharge Cycles' or depleting the battery to the 'Low Battery' warning. Note: if the handset is discharged to the 'Low Battery' message or fully discharged (to handset power off) this will not reduce useful battery life.

- Battery packs must only be charged using the appropriate Nortel battery charger. Battery packs can be charged in a Nortel WLAN Handset resting in its charger, in one of the spare slots in a dual slot charger or in a quad slot charger. While the battery pack is in the WLAN Handset, the pack can be charged whether the phone is powered on or off prior to inserting into the charger. When charging, the handset will present a 'charging' status on the LCD display. When charging a battery by itself in either the rear slot of a dual charger or in a quad charger, an LED will light when the battery is installed. When charging is complete, the LED will turn off.

- When proper charging practices are followed, the Nortel WLAN Handset battery pack is expected to have a service life of between 400 and 500 charge /discharge cycles. Nortel strongly encourages our customers to replace their battery pack when approaching this extent of usage. It is difficult to give an exact definition of a 'charge/discharge cycle' but for this battery technology a single charge cycle is defined as each time a battery is drained of approximately 80% of full charge capacity. The 80% or greater discharge could occur in a single use or in multiple uses followed by a full charge.

Towards the end of the useful life of the Li-on batteries the user will notice degradation in the performance with standby times tending to decrease before talk times are affected.

In Summary, batteries that are used extensively each day or for shift work should be changed every 500 charge cycles or each year whichever is the sooner. Batteries that are used less frequently should still be changed when approaching the 500 charge cycle mark.

Chargers

WLAN Handset Chargers are offered in three varieties and are common over both WLAN Handset 6100 Series models:

- Single-slot Desktop Charger,
  - Single slot provides housing for the handset only.
  - Charges Handset with “Standard”, “Extended” or “Ultra-Extended” Battery Pack
- Dual-slot Desktop Charger
  - Charges Handset with “Standard”, “Extended” or “Ultra-Extended” Battery Pack and one spare Battery Pack (any capacity)
  - Batteries are charged sequentially
  - Also used for the administering the handset configuration using the Handset Admin Tool (HAT) as detailed later
- Quad-slot Battery Pack Charger.
  - Charges up to four “Standard”, “Extended” or “Ultra-Extended” Battery Packs (no handset slots)
  - Batteries are charged in parallel
  - Desktop or wall-mountable

Charging condition for the Single-slot or Dual-slot handset slot is indicated on the handset display with the word “Charging …”

- Fully charged condition for the handset slot is indicated by “Charge Complete”
- Charging condition for the spare battery on the dual-slot charger is indicated by the red LED on the front of the charger
- Fully charged condition for the spare battery slot is indicated by the LED extinguishing

Calls can be made with the handset in the charger and the user connected through a headset or when using the “handsfree” speakerphone mode. All three Chargers continue to use their respective current regional power supplies (They work with the current range of power supplies [e.g. NTTQ4101E6 for NA; NTTQ4111E6 for EMEA; NTTQ4121E6 for UK]).

Accessories

The following accessories are specific to each handset model as they are slightly different sizes:

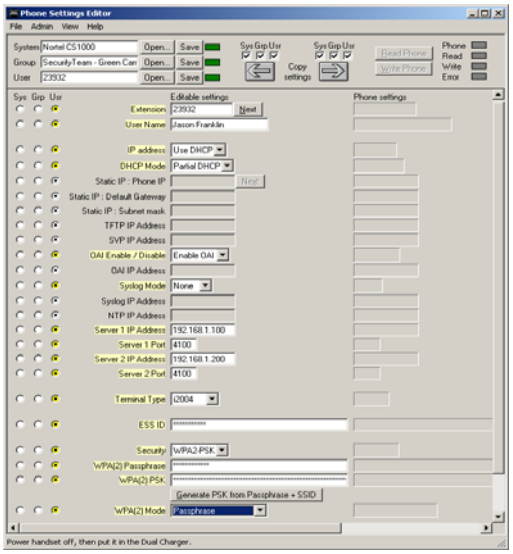
- WLAN Handset 6120 Belt Clip [NTTQ4029E6]
- WLAN Handset 6120 Carry Case [NTTQ4032E6]
- WLAN Handset 6140 Belt Clip [NTTQ4031E6]
- WLAN Handset 6140 Carry Case [NTTQ4034E6]

The following accessories are common to both handset models:

- WLAN Handset 6100 Series Rugged Carry Case [NTTQ4036E6]
- WLAN Handset 6100 Series Cord Lanyard Quick Disconnect [NTTQ4038E6]
- WLAN Handset 6100 Series Coiled Lanyard Clothing Clip [NTTQ4038E6]
- These WLAN Handset 6100 Series models work with the current headset [NTTQ5501]

Handset Administration Tool (HAT)

The HAT improves the productivity of system administrators by allowing configuration changes to be quickly loaded into the WLAN Handset 6100 Series models. The Handset Administration Tool is also useful for changing the WPA and WPA2 pre-shared keys. It can take an image of the internal operating environment of a failed handset, providing a better view of the handset operation status at time of failure.



For the WLAN Handset 6120 or WLAN Handset 6140 products, the HAT comprises a standard Dual-slot Desktop Charger [NTTQ4023E6] with a Nortel supplied USB cable [NTTQ4043E6] to enable it to be connected into a local PC (running Microsoft Windows). PC Software will be provided on the nortel.com Technical Support Portal software download site in the same location as the WLAN Handset 6120 or WLAN Handset 6140 firmware.

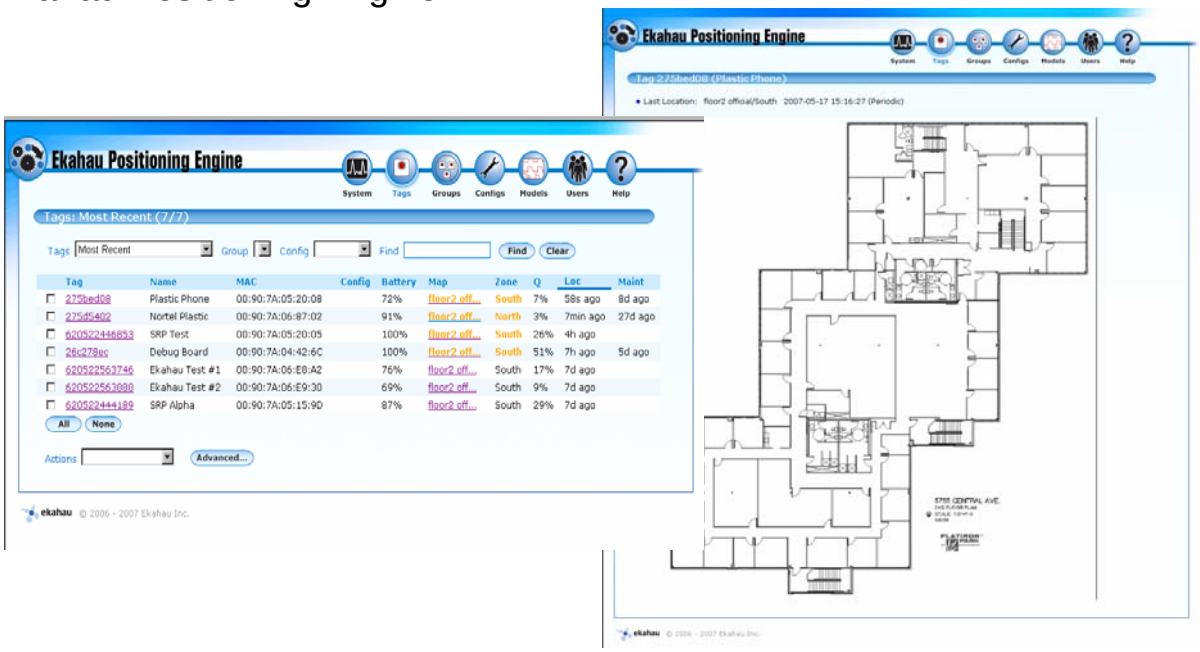
Please note that the physical interface (Dual-slot Desktop Charger) and special software used with the Handset Administration Tool (HAT) is specifically designed for the Nortel WLAN Handset 6120 and WLAN Handset 6140 models and is not compatible with the previous WLAN Handset 2210/2211/2212 offering.

The WLAN Handset 2200 Series models continue to use their existing Configuration Cradle (NTTQ67AAE6) and respective software

Real Time Location Service

The Ekahau Real Time Location Services (RTLS) product provides a means of tracking and locating devices, fixed and mobile assets, equipment and people as they move / are moved around a site.

Ekahau Positioning Engine:-



It depends on a sophisticated site survey to position access points or to tweak the positions of AP's in an existing site in order to provide the best coverage possible in all areas. The product builds a map of the site as a reference against which real time locations are plotted. Ideally a device will be able to see 3 or more AP's at any location to allow the Ekahau proprietary RSSI Fingerprinting algorithm to plot its location. Information sent to the Ekahau Positioning Engine (EPE) will mimic that sent from an RFID tag

Nortel WLAN Handsets 6120 and 6140 are field upgradeable to interface into the EPE to provide a complete system for tracking and locating the handsets - other devices being tracked using RFID tags.

Ekahau RF Tags

Ekahau clients

The client monitors the RSSI signal strength of access points in the near proximity and reports these to the EPE. The EPE uses proprietary algorithms to map this data against the site map to determine the current location of the handset. The handset can be programmed to send location information at intervals of 1, 5 or 10 minutes, or if moving then automatically whenever handing-off to new access point(s) as per the list below:-

- Standby Stationary -> 1, 5, 10 Minutes
- Standby Roaming -> On roaming detect, and then revert back to Standby-stationary mode until next roaming detect
- In Call Stationary -> 2-6 seconds for normal in-call mode
- In Call Roaming -> On roaming detect, and then revert back to In-call-stationary mode until next roaming detect

With the Ekahau Client included (introduced in firmware release 115.015 for WLAN Handsets 6100 series) RTLS will be independent of the brand or make of WLAN infrastructure with support currently for both 802.11a and b/g transmission. The Ekahau Client is not supported on WLAN Handsets 2210/2211/2212.

A few tips are recommended for programming the system (more information can be found in the NTP's) are as follows:-

- Ensure that the handset can communicate with the EPE using port 8552 (port is hard coded as 8552)
- SSID broadcast should be disabled
- Auto-RF must be disabled
- Access Points should be staggered, including ones on adjacent floors, to provide a unique RSSI Fingerprint from each location
- An icon on the handset will be lit to indicate that RTLS has been turned on for that handset
- The RTLS configuration on the handset is under Admin Main Menu => Phone Setup => Location Services. There is an on/off toggle, plus a menu choice of 1, 5 or 10 minute static reporting and also a choice for setting the IP address of the EPE.
- The EPE IP address must be static and not dynamic discovered via DHCP.
- Configuration options for RTLS were introduced in the Nortel HAT Tool version 2.0.

Call Server Compatibility, Requirements, and Advisements

The following table lists the versions of firmware/software which are currently supported on different Nortel call servers.

Call Server	Advisements
CS1000 R5.5	Patch MPLR25768 is required to support Swedish, Dutch and Italian languages (this will be integrated into R6.0).
CS1000 R5.0	Patch MPLR23796 is required to support Norwegian language (this was integrated into R5.5). Patch MPLR25768 is required to support Swedish, Dutch and Italian languages (this will be integrated into R6.0). PEP MPLR24634 is required to register G729 and G733 codecs for MC32S card (IP-5.00.31) – using Best Quality (BQ) with G723 where the WLAN Handsets 6100 do not support G723, the patch will allow them to use G729 (this was integrated into R5.5).
CS1000 R4.5 - X21 4.50W - IP Line 4.50.25 or later - SS 4.50.25 or later	Patch MPLR25768 is required to support Swedish, Dutch and Italian languages (this will be integrated into R6.0). Requires PEP's MPLR22419. If the Signaling Server is not running 4.50.88 or later then PEP MPLR20330 (patch was integrated in 4.50.88) Patch MPLR23796 is required to support Norwegian language (this was integrated into R5.5).
CS2000 SN10	Introduction release of WLAN Handset 6100 Series on CS2000 Call Server
CS2100 SE10	Introduction release of WLAN Handset 6100 Series on CS2100 Call Server
BCM200/400 R4.0	Introduction release of WLAN Handset 6100 Series on BCM200/400
BCM50 R3.0	Introduction release of WLAN Handset 6100 Series on BCM50
BCM50 R2.0	WLAN Handset 6100 Series is backwards compatible with BCM50 R2.0
SRG50 R3.0	Introduction release of WLAN Handset 6100 Series on SRG50

In all cases at time of releasing Version 2 of this Bulletin the following are the approved releases of the other WLAN Handset components:-

WLAN Handset 6100 Series Handsets ->	115.017
WLAN Handset 221x Series Handsets ->	97.071
WLAN Handset 6100 HAT Tool ->	2.2
WLAN Telephony Manager 2245 ->	174.34
WLAN Applications Gateway 2246 ->	82.017

As new firmware / software builds are introduced into the field they become available on the nortel.com website for download. As they are released the new builds are loaded into the product at manufacture and product shipped after the GA will contain the new build of firmware / software. Nortel runs a first-in-first-out system in its warehouses and therefore some product may be received loaded with the previous build. It is recommended that for all installations the latest versions of firmware / software be downloaded from nortel.com onto

the TFTP server from where the handsets and other components will upload the latest versions on boot-up.

WLAN Access Point Compatibility

The Nortel WLAN Handsets 6100 Series products are not bound to any specific Manufacturer or Model of WLAN infrastructure but rather work over a wide range of products including both Nortel provided WLAN networks and other suppliers' networks.

Our products are routinely tested for interoperability with these other manufacturers' products as they release new models and new releases of models. The full list of compatibility can be seen on the VIEW website on URL
http://www.spectralink.com/files/scms_docs/1725_36040_001_AN.pdf

Self Healing Capability on WLAN Telephony Manager 2245

In the current system up to 16 of the Nortel WLAN IP Telephony Manager 2245 units or up to 4 of the Nortel WLAN IP Telephony Manager 2245 10 User or 20 User units can be networked together. Each handset is served by a single unit with the load being spread over the network. There is a concept of a manually configured primary unit that organizes the handset registrations and the load sharing. This primary unit represents a "single point of failure".

The enhancement introduced in release 115.015, eliminates the concept of this primary unit thereby eliminating the single point of failure. Some aspects of the functionality are explained below:-

- The handsets are programmed with the IP address of a designated Nortel WLAN IP Telephony Manager 2245 unit. This is usually the same for all handsets but can be varied if required.

- As the handsets register with this unit, they receive the list of IP addresses of the other units in the network. Also as they register they are distributed among other Nortel WLAN IP Telephony Manager 2245 units to share the load. The subsequent unit they are assigned to then becomes their registration point. The list of addresses is automatically updated each time the handset powers on.

It must be realized that the Nortel WLAN IP Telephony Manager 2245 performs several functions related to the handling of calls. It provides a proxy for the handset communicating into the call server; it also provides call admission control, communicating with access points to control which new call attempts use which access points (AP's) to ensure optimum capacity usage. Any given Nortel WLAN IP Telephony Manager 2245 will handle the handsets that are registered to it but will also be controlling AP's and it is not possible to determine which AP's any given Nortel WLAN IP Telephony Manager 2245 is controlling.

After initial registration, a failure of any one Nortel WLAN IP Telephony Manager 2245 unit will result in:-

- the dropping of any active calls for the handsets that it serves; the handsets re-registering with another Nortel WLAN IP Telephony Manager 2245 unit in their list; and returning to active state after this registration period on another unit (again subject to load sharing between units).

- the dropping of any active calls handled through the AP(s) this unit is controlling. In this way it is not possible to accurately predict which calls will stay active when a Nortel WLAN IP Telephony Manager 2245 fails but overall it can be stated that the system will fully recover and will reassign handsets and AP's to other working units within the recovery period.

- all handsets will eventually reboot in order to download the new Nortel WLAN IP Telephony Manager 2245 mapping. Handsets that are not affected by a failing Nortel WLAN IP Telephony Manager 2245, will reboot once any active call has completed.

Recovery period for all handsets will be within 60 seconds. A failing Nortel WLAN IP Telephony Manager 2245 unit will display an alarm on its front panel and on an Administrative Console (if used). Handsets associated with the unit will display 'No SVP Response' until re-registered.

During the downloading of the new software to the network of Nortel WLAN IP Telephony Manager 2245 units, the whole network is inoperative. After completion the network comes back into service automatically without need of further manual intervention. Previous configuration of both the units and the handsets is not affected. In order for this Self Healing functionality to work, the Nortel WLAN IP Telephony Manager 2245 software must be at release 174.034 or greater AND the Nortel WLAN Handset 2210/2211/2212 firmware must be at release 97.071 or greater AND the Nortel WLAN Handset 6100 Series firmware must be at release 115.015 or greater. If any component is at an earlier release then the system will only work in the current master/slave mode for that component.

[Note when assigning the pool of alias IP addresses for the network of Nortel WLAN IP Telephony Manager 2245 units, ensure the pool is large enough for all the units.]

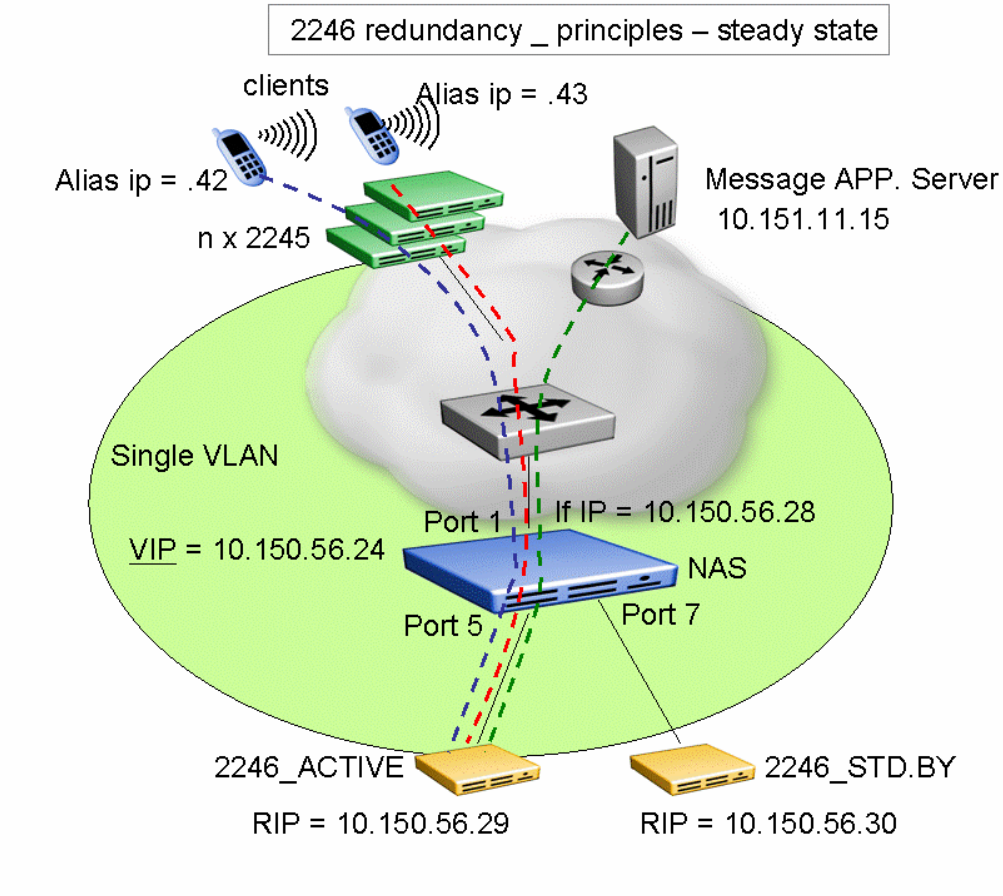
Redundancy for WLAN Applications Gateway 2246

Nortel WLAN Handsets can only associate with one WLAN Applications Gateway and this forms a possible single point of failure important in systems where continued working of the WLAN Handsets is critical. One way of achieving redundancy for the WLAN Applications Gateway 2246 server is to have a second unit with identical configuration and identical IP addresses standing by and to manually switch these units over when the primary one fails.

This manual process is not acceptable to many customers where messaging services delivered via the WLAN Applications Gateway 2246 is defined as business critical applications. Hospitals are typical examples of such customer.

To provide a better redundancy, a Nortel Application Switch (NAS) can be deployed. The two identical WLAN Applications Gateway 2246's are both connected to the NAS, both have their own real IP address while the NAS uses a Virtual IP address looking out to the application server. From the point of view of the messaging application and the wireless handsets the address of the WLAN Applications Gateway 2246 is the NAS virtual IP Address which will stay the same no matter which WLAN Applications Gateway 2246 is currently active.

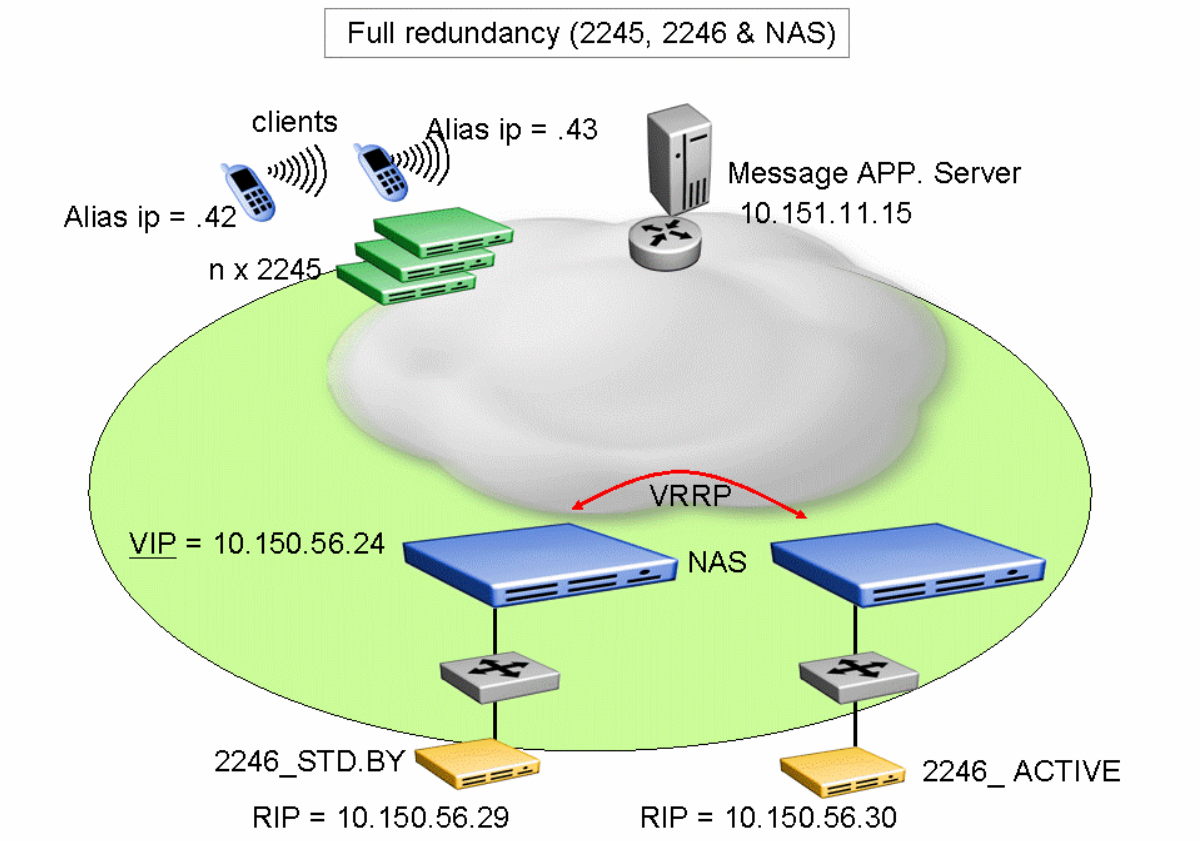
However, as only one WLAN Applications Gateway 2246 can be seen as active at any given time the NAS is configured to treat the WLAN Applications Gateway 2246's as one active (primary) and one standby (secondary) system. Only if the primary unit fails will the NAS steer traffic to the secondary unit. Note that there is no synchronization between the two units. A diagrammatic representation of the network is shown below:-



Special considerations are as follows:-

- The NAS provides a Health Check at regular intervals and this is best done using an ICMP based Health Check to avoid the WLAN Applications Gateway 2246 handling excessive TCP session traffic.
- At time of writing there is a known defect with the WLAN Applications Gateway 2246 as follows:- when the primary WLAN Applications Gateway 2246 fails the NAS switches over to the secondary, which works well. When the primary returns the NAS attempts to switch back but the primary does not establish a new TCP session and the network fails. A maintenance build of WLAN Applications Gateway 2246 software is being developed to fix this problem. The workaround is to configure the NAS to treat the secondary unit as the new primary although this is a non-standard configuration for the NAS.
- The failover time is not instant and in fact could take up to 30 seconds for full switch over.

In the above presented solution the NAS also represents a single point of failure. Extending the solution to a fully redundant solution can be achieved by simply adding a second NAS and using VRRP (Virtual Router Redundancy Protocol) between the two NAS devices.



A white paper is being produced to provide more details on installing and configuring this solution and will be posted on our websites.

Perceived Difference in Reported RSSI Levels between WLAN 6100 Series Handsets and WLAN Handsets 221x Series

There has been some perceived differences in RSSI (Received Signal Strength Indication) reported values between the WLAN Handsets 6100 Series, the WLAN Handsets 2200 Series and other site survey equipment. Our handsets send out RSSI information as syslog data (if enabled) every five seconds while the phone is in call, and display the RSSI's when operating in the Site Survey mode or additionally on screen three of the phone's diagnostics display (if enabled).

Two phones of different types may not report the same RSSI for the same situation, and in fact two seemingly identical wireless phones will often report a different RSSI for what appears to be the same situation. The actual RSSI reading is affected by phone orientation and environment, such as people nearby, as well as differences in radio frequencies (channels) so it is extremely difficult to get repeatable RSSI readings even from a single wireless phone in a real environment.

The RSSI value is quite suitable for judging whether one signal is stronger than another, by comparing the two RSSI values reported, but it is not suitable in and of itself for deciding whether a signal is adequate. The main purpose of the RSSI reading is for the phone to judge the relative signal strengths of two or more Access Points (APs) when more than one AP is available.

It is recommended that in all installations a proper site survey be carried out for each site using professional site survey equipment. Nortel offers a selection of Remote and On-Site surveys as part of our Service Express brand.

Firmware Download Instructions

WLAN Handset 6100 Series firmware version 115.017 and Handset Administration Tool (HAT) software version 2.2

The Nortel WLAN Handset 6120 or WLAN Handset 6140 may not have the current GA version of the firmware when shipped from Nortel warehouse. On installation and subsequent rebooting the handsets will look to the TFTP server for the latest firmware version which must have been downloaded from the nortel.com website and placed on the server.

Firmware version 115.017 is compatible with the WLAN Handset 6120 and WLAN Handset 6140. HAT software 2.2 is required to download handset firmware 115.017 through the Handset Administration Tool. No hardware change is required.

Use of the WLAN Handset 6120 and/or WLAN Handset 6140 in a system will require WLAN IP Telephony Manager Software to be update to version 174.034 (or greater). If a WLAN Applications Gateway 2246 product is part of the system then it must be upgraded to software version 82.017 (or greater). Both these software levels are backward compatible with the existing WLAN Handset 2200 models.

To download the files from the Nortel web site, follow these instructions:
Note: You will need to log in to complete the steps below.

1. Access the www.nortel.com/support web site and log in

2. Select “Products” and then select “**A-Z**”
3. Select “**W**” in the Products A-Z section.
4. Scroll to either “**WLAN Handsets 6120”** or “**WLAN Handset 6140”** and select “**Software Downloads**”.
5. Select the “**WLAN Handsets 6100 Firmware version 115.017**” link and download the file.
6. Select the “**Handset Administration Tool software version 2.2”** link and download the file
7. Refer to the applicable NTP for instructions on loading the firmware onto the WLAN Handset 6120/6140.

WLAN IP Telephony Manager 2245 Software – version 174.034

Version 174.028 software is compatible with either new or existing WLAN IP Telephony Manager 2245. No hardware change is required.

To download the file from the Nortel web site, follow these instructions:
Note: You will need to log in to complete the steps below.

1. Access the www.nortel.com/support web site and log in
2. Select “Products” and then select “**A-Z**”
3. Select “**W**” in the Products A-Z section.
4. Scroll to “**WLAN Telephony Manager 2245”** and select “**Software Downloads**”.
5. Select the “**WLAN IP Telephony Manager 2245 version v174.034**” link and download the file.
6. Refer to the applicable NTP for instructions on loading the software onto the WLAN IP Telephony Manager 2245.

WLAN Applications Gateway 2246 Software – version 82.017

Version 243.006 software is compatible with either new or existing WLAN Applications Gateway 2246. No hardware change is required.

To download the file from the Nortel web site, follow these instructions:
Note: You will need to log in to complete the steps below.

1. Access the www.nortel.com/support web site.
2. Select “**A-Z**” from the “**Find Products**” section.
3. Select “**W**” in the Products A-Z section.
4. Scroll to “**WLAN Applications Gateway 2246”** and select “**Software Downloads**”.
5. Select the “**WLAN Applications Gateway 2246 version v82.017**” link and download the file.
6. Refer to the applicable NTP for instructions on loading the software onto the WLAN Applications Gateway 2246

In mixed systems of WLAN Handset 6100 Series and WLAN Handsets 2210/2211/2212 models please ensure that both sets of current handset firmware (e.g. 115.017 and 97.071 at time of writing) are loaded onto the TFTP server.

The config files from the WLAN Handset 6100 firmware download should be used as they handle configuration for both platforms of handsets

Boot Sequence using Full DHCP

Care should be taken when using Full-DHCP mode to provide an IP address to the handset because in addition to the IP address being provided to the set, some options are passed over the proper formats of which are critical for the handset to boot up and register with the proper CS1000 system

The recommended vendor option for Nortel is “128” although some other options will work, see below:-
43, 128, 144, 157, 191, 251

Show below is the format that the handset is expecting of such an option

Nortel-i2004-A,iii.jjj.kkk.lll:pppp,aaa,rrr;iii.jjj.kkk.lll:pppp,aaa,rrr;bbb.ccc.ddd.eee:fffff;nnnnnnnnnnnn.

Where
Nortel-i2004-A = Nortel WLAN Handset string identifier (same string as Nortel’s other IP Clients
iii.jjj.kkk.lll:pppp,aaa,rrr = First call server IP information
iii.jjj.kkk.lll:pppp,aaa,rrr = Second call server IP information (optional)
bbb.ccc.ddd.eee:fffff = Application Server IP information (optional)
nnnnnnnnnnnn = not used at this time

An example of a working system with all the configured options is given below:-

Scope Options

Option Name	Vendor	Value
003 Router	Standard	131.149.209.193
006 DNS Servers	Standard	131.149.209.39
007 Log Servers	Standard	131.149.209.39 Syslog Server
015 DNS Domain Name	Standard	cse.nortel.com
042 NTP Servers	Standard	129.6.15.28 Time Server
066 Boot Server Host Name	Standard	131.149.209.39 TFTP Server
128 PBX S1 S2 Server IP	Standard	Nortel-i2004-A,131.149.209.84:4100,1,10;131.149.209.84:4100,1,10.
151 2245 Server	Standard	131.149.209.226
152 2246 OAI	Standard	131.149.209.227

In addition to the vendor specific options, Option 7 = Syslog Server and Option 42 = Time Server

Network Recommendation

Nortel recommends maximizing security and minimizing accessibility for unnecessary traffic to reach the WLAN Handsets by adopting the following steps:-

1. Customers should create a separate VLAN for voice traffic and map the handsets to this VLAN in order to mask them from other devices on the network
2. Implement Access Control Lists (ACL's) on their WLAN infrastructure to contain the handsets but deny other traffic.
    - The WLAN IP Telephony 2245 uses IP protocol 119 and encapsulates both signaling and media (RTP) into a common packet format allowing the access points to prioritize legitimate handset traffic
    - Necessary traffic for instance DHCP needs to be allowed, while all other traffic should be denied.

Ordering Guidelines and Procedures

The Nortel WLAN Handset 6100 Series product codes listed below are Generally Available and shipping effective June 20, 2007. Nortel Order Management will accept an order for any codes listed in this product bulletin.

PEC	CPC	DESCRIPTION
Handset Codes		
NTTQ4020E6	N0129562	Nortel WLAN Handset - 6120 Handset
NTTQ4021E6	N0129563	Nortel WLAN Handset - 6140 Handset
Charger Codes		
NTTQ4022E6	N0129564	Nortel WLAN Handset - 61xx Single Slot Handset Charger
NTTQ4023E6	N0129565	Nortel WLAN Handset - 61xx Dual Slot Handset Charger
NTTQ4024E6	N0129566	Nortel WLAN Handset - 61xx Quad Battery Charger
Battery Pack Codes		
NTTQ4025	N0129567	Nortel WLAN Handset - 61xx Standard Battery Pack
NTTQ4026	N0129568	Nortel WLAN Handset - 61xx Extended Battery Pack
NTTQ4027	N0129569	Nortel WLAN Handset - 61xx Ultra Extended Battery Pack
Accessories Codes		
NTTQ4029E6	N0129571	Nortel WLAN Handset - 6120 Belt Clip

NTTQ4031E6	N0129574	Nortel WLAN Handset - 6140 Belt Clip
NTTQ4032E6	N0129575	Nortel WLAN Handset - 6120 Carry Case
NTTQ4034E6	N0129577	Nortel WLAN Handset - 6140 Carry Case
NTTQ4036E6	N0129579	Nortel WLAN Handset - 61xx Rugged Carry Case
NTTQ4037E6	N0129580	Nortel WLAN Handset - 61xx Cord Lanyard Quick Disconnect
NTTQ4038E6	N0129581	Nortel WLAN Handset - 61xx Coiled Lanyard Clothing Clip
NTTQ4039E6	N0129582	Nortel WLAN Handset - 61xx Belt Clip Swivel Accessory
NTTQ4040E6	N0129583	Nortel WLAN Handset – 61xx Belt Clip Ratchet Accessory
NTTQ4043E6	N0129586	Nortel WLAN Handset - 61xx Dual Slot Handset Charger USB cable
Handset Kits		
NTTQ4044E6	N0142639	Nortel WLAN Handset - 6120 Handset Kit with single slot charger, standard battery, belt clip
NTTQ4045E6	N0142640	Nortel WLAN Handset - 6120 Handset Kit with dual slot charger 2 extended batteries, belt clip
NTTQ4046E6	N0142641	Nortel WLAN Handset - 6140 Handset Kit with single slot charger, standard battery, belt clip
NTTQ4047E6	N0142642	Nortel WLAN Handset - 6140 Handset Kit with dual slot charger, 2 extended batteries, belt clip

Training

Global Knowledge is the official training partner for Nortel for North America. The following training courses have been updated to include the WLAN Handset 6100 Series offering:

Course Title	Format	Number
Nortel WLAN 2300 Solution Planning, Implementation and Management	Classroom based	6825C

Further details on course offerings and schedules can be obtained from the Global Knowledge website at
https://get.globalknowledge.com/norteltraining/catalog/schedule.php?pn=6825C

References and Related Documents

For more information on the Nortel WLAN Handset 6120 and WLAN Handset 6140 and accessories, please refer to related documents. Additional sales collateral information for Nortel authorized resellers is also available.

Product information, and features and benefits can be found on Nortel.com on the URL www.nortel.com follow the route Products / Phones Clients & Accessories / Wireless Phones / WLAN Handsets 6100 Series.

From this location can be accessed details on the product family together with Brochures, Case Studies and other documents located in the tabs on the left of the web page.

Also from the “Product Portfolio” page and clicking either “WLAN Handsets 6120” or WLAN Handset 6140” the technical documentation including User Guides and Installation and Maintenance Manuals can be accessed, together with Product Bulletins and firmware downloads. These documents are provided on soft copy only and not in paper form. Some of this information will require the user to log in.

Getting Started documentation is available in a multi-language version shipped in the box with the handsets.

To view the most recent version of this bulletin, please visit Nortel’s Partner Information Center on the web at: http://www.nortel.com/pic.

Appendix 1: Handset Administration Menus

Appendix 1 provides a view of the Administrator configuration menus available from the WLAN Handsets 6120 and 6140.

> Entering Admin menu

- with handset powered off
- press and hold Green Key
- then press and release Orange Key
- then release Green Key when “Admin Menu” is displayed
- enter password (default 123456)
- use the navigation keys to scroll through the options and select menus

Note that the handsets come with “Phone Config / Telephone Protocol = type 32” as default as required for Nortel operation. They do NOT come as with “Phone Config / Telephone Protocol = type 30” as is shown in the table below

Phone Config	Language	*English Français Deutsch Español Português Norsk		
	Telephony Protocol	*Type 030 Type 032		
	Password [Disable/Enable]			
	Change Password			
	System Speed-dial	Enter Number	Enter Name	Assign Speed-dial
	Set Terminal Type i2004 3rd Party			
	Startup Keylock			
	Speakerphone [Disable/Enable]			
	Push-to-Talk	PTT Enable/Disable		
		Allowed Channels	*Channel 1 *Channel 2 .... *Channel 24	
		Name Channels	Channel 1 Channel 2 .... Channel 24	
		Priority Channel On/Off	Name Channel	
	OAI [Disable/Enable]			
	Time Zone	[list] *GMT		
	Daylight Savings	*DST No Adjust DST Auto (USA) DST Auto (AUS) DST Auto (EURO)		

Network Config	IP Addresses	*Use DHCP	*Full DHCP	
			Partial DHCP	Server1 IP Address Server1 Port Server2 IP Address Server2 Port
		Static IP	Phone IP Default Gateway Subnet Mask TFTP Server IP Syslog Server IP Time Server IP	
			SVP IP	
			Call Server Info	Server1 IP Address Server1 Port Server2 IP Address Server2 Port
			OAI Server IP	
	SSID	[enter]		
	Security	*None		
		WEP	Authentication	*Open System Shared Key
			WEP Enable/*Disable	
			Key Information	Default Key Key Length Key 1-4
			Rotation Secret	
		Cisco FSR	Username Password	
		WPA-PSK	*Passphrase Pre-Shared Key	
		WPA2-PSK	*Passphrase Pre-Shared Key	

	Reg. Domain	1 2		
			[802.11 Config]	
			a → [802.11a] 5.150-5.250 5.250-5.350 DFS 5.470-5.725 DFS 5.725-5.825 DFS	
			*b & b/g mixed	
			g only → [Transmit Power] 5mW (7dbm) 10mW (10dbm) 20mW (13dbm) *30mW (15dbm) 40mW (16dbm) 50mW (17dbm) 100mW (20dbm)	
Diagnostics	Run Site Survey			
	Diagnostics Disable/Enable			
	Syslog Mode	*Disabled Errors Events Full		
	[Error Handling Mode] Halt on Error/ *Restart on Error			
Restore Defaults				
			Secret	
		Cisco FSR	Username Password	
		WPA-PSK	*Passphrase Pre-Shared Key	
		WPA2-PSK	*Passphrase Pre-Shared Key	