

Siemens HiPath Wireless System Configuration and Deployment Guide

SpectraLink's Voice Interoperability for Enterprise Wireless (VIEW) Certification Program is designed to ensure interoperability and high performance between NetLink Wireless Telephones and WLAN infrastructure products. The products listed below have been thoroughly tested in SpectraLink's lab and have passed VIEW Certification. This document details how to configure Siemens HiPath C10, C100, C1000 Wireless Controllers and 2610 & 2620 access points (APs) with NetLink Wireless Telephones.

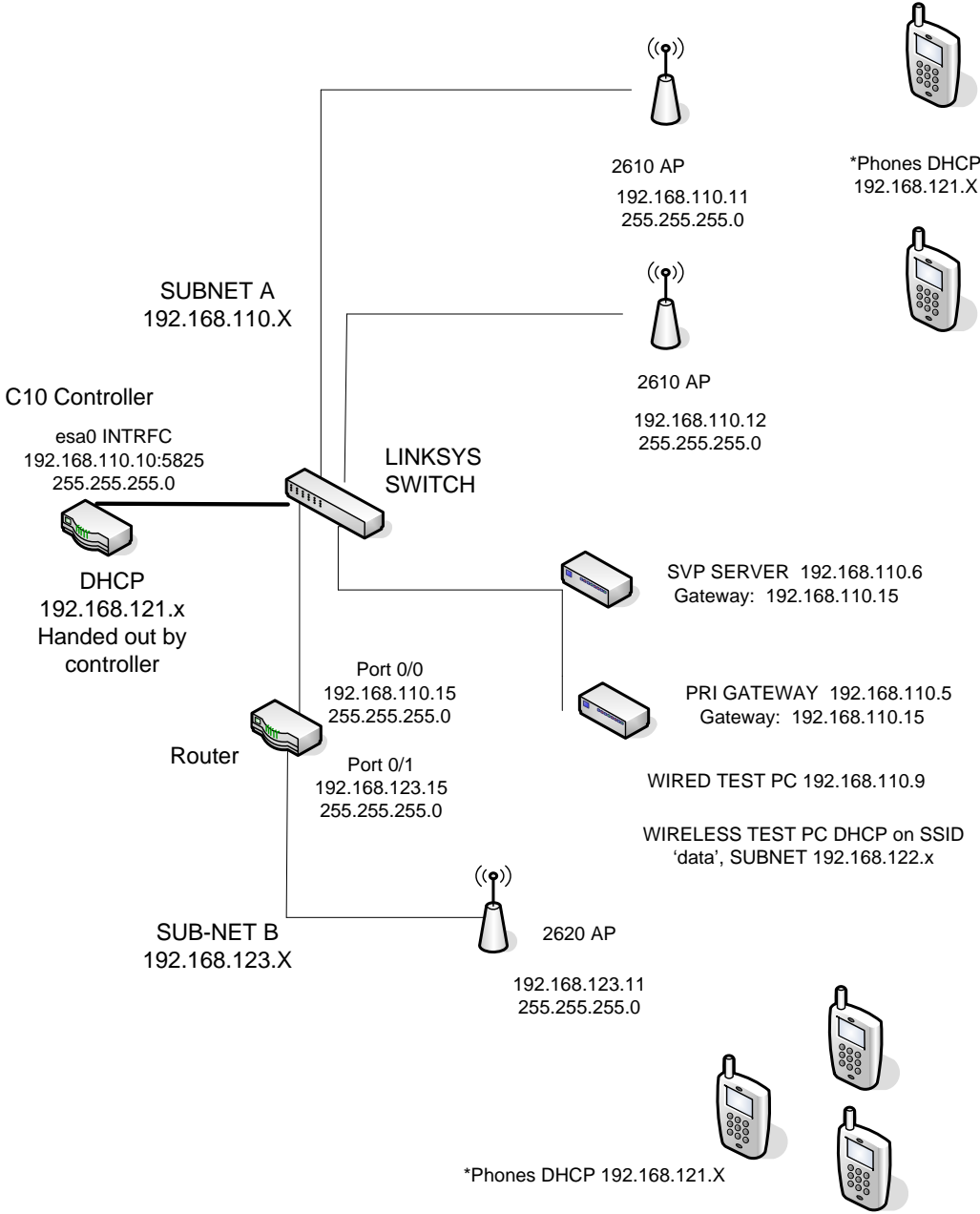
Certified Product Summary

Manufacturer:	Siemens HiPath Wireless: http://enterprise.usa.siemens.com/products/solutions/hipathwireless.html	
Approved products:	Wireless Controllers	Access Points
	C10†	2610†
	C100 C1000	2620†
RF technology:	802.11b/g	
Radio:	2.4 – 2.484 GHz	
Security:	WPA-PSK, WPA2-PSK	
AP firmware version tested:	3.1.4.03.03	
NetLink handset models tested:	e340/h340/i640	8000 Series
NetLink handset software tested:	89.124	122.010 or greater
NetLink radio mode:	802.11b	802.11b
Maximum telephone calls per AP:	10	
Recommended network topology:	Switched Ethernet (recommended)	

† Denotes products directly used in Certification Testing

Network Topology

The following topology was tested during VIEW Certification. It is important to note that these do not necessarily represent all "certified" configurations. The access points were powered through a mid-span POE adaptor.



*All clients are on their own 'Virtual Subnet', per SSID

Known Limitations

1. Beacons are sent from the AP inconsistently; therefore you may see decreased battery life on the handsets.
2. A hex-key is not supported with both WPA-PSK and WPA2-PSK. You must use a passphrase for each.
3. Because the Controller configures a virtual subnet, broadcast data cannot be sent to the handsets.

Installing Software & Configuration

1. If software upgrades are required, contact Siemens Customer Support for the latest version of software and instructions.
2. The current version of software installed can be found by opening a telnet session of the AP and typing the command `version`, or by looking at the configuration GUI under **Wireless APs** and selecting the general tab for the AP in the field **s/w version**.
3. If you encounter difficulties or have questions regarding the configuration process, please contact your Siemens representative or visit the web site <http://enterprise.usa.siemens.com/products/solutions/hipathwireless.html>

Initial Setup

1. The following instructions are for configuring a wireless controller and a number of access points with no prior configuration.
2. All of the initial setup is done via a web interface. Connect a 'Cross-Over' Ethernet cable directly from the Management Port of the controller to a PC's Ethernet port.
3. Log onto the controller by opening a web browser and connect to <https://192.168.10.1:5825/>. The default username is **admin**; the default password is **abc123**.
4. Do this step only if it is necessary to reset the controller back to its factory default configuration:
 - a. Click the **Wireless Controller** button to open the **Wireless Controller Configuration** screen.
 - b. In the navigation pane, click **System Maintenance**.
 - c. Click the **Reset database to factory default and reboot** button.
 - d. Click the **Apply** button.

This will reset the database and cause the controller to reboot. It will take three to four minutes before the controller is finished.

Controller Setup

The setup steps described below refer to the network topology diagram shown in this document. Make sure all the access points are disconnected from the system if configuring the system for the first time.

Assigning an IP address to a wireless controller

1. Log onto the controller by opening a web browser and connect to <https://192.168.10.1:5825/>. The default username is **admin**; the default password is **abc123**.
2. Click the **Wireless Controller** button.
3. In the navigation pane, click **IP Addresses**.
4. Change the value of **esa0** to **192.168.110.10** for the **IP Address**, and to **255.255.255.0** for the **Subnet mask**.
5. Select the **Mgmt** and **SLP** check boxes for this port only (thus turning it on). Leave these unchecked (off) for the other ports.
6. For **Function**, select **Host Port** if static routing is used. Otherwise, select **Dynamic Port** if **OSPF** is being used for routing and routing advertisements.
7. Enter **esa0** for **Multicast Support**. Refer to the screen shot shown below.
8. Click the **Save** button.



This is for topologies where the SpectraLink gateway(s) and SVP Servers are located adjacent to the esa0 port, as was done in this VIEW Certification test. In topologies where the setup is different, this multicast setting should be configured to whichever port the SpectraLink servers are adjacent to. This setting permits proper wired replication of multicast data from the wireless subnet.

HiPath Wireless Convergence Software - Wireless Controller Configuration - Microsoft Internet Explorer

Address: https://192.168.110.10:5825/SysMgmt/SysMgmt.php?sa=5a150f37bfecda27c1d8e36b62ffc8db

SIEMENS HiPath Wireless Controller Configuration

Home | Logs & Traces | Reports | **Wireless Controller** | Wireless APs | VNS Configuration | Mitigator | About | LOGOUT

System Maintenance

Routing Protocols

IP Addresses

Port Exception Filters

Check Point

Mitigator

SNMP

Network Time

Management Users

Software Maintenance

Utilities

Web Settings

Management Port Settings

Hostname: SpectraView1 **Management Gateway:** 192.168.10.100
Domain: siemens.com **Primary DNS:**
IP Address: 192.168.10.1 **Secondary DNS:**
Subnet mask: 255.255.255.0

Interfaces

Port	IP address	MAC	Subnet mask	Port Func	MTU	Mgmt	SLP
✓ esa0	192.168.110.10	00:00:50:1A:5C:B6	255.255.255.0	Host Port	1500	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
✓ esa1	10.0.1.1	00:00:50:1A:5C:B7	255.255.255.0	Host Port	1500	<input type="checkbox"/>	<input type="checkbox"/>
✓ esa2	10.0.2.1	00:00:50:1A:5C:B8	255.255.255.0	Host Port	1500	<input type="checkbox"/>	<input type="checkbox"/>
✓ esa3	10.0.3.1	00:00:50:1A:5C:B9	255.255.255.0	Host Port	1500	<input type="checkbox"/>	<input type="checkbox"/>

IP address: **Function:**
Subnet mask: **MTU:**

Multicast Support:

[SpectraView1 | 0 days, 19:28] User: admin Port status: M Software: Rel3.1 (3.1.1.00.09) | Tracing: Inactive
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Address: https://192.168.110.10:5825/SysMgmt/SysMgmt.php?sa=5a150f37bfecda27c1d8e36b62ffc8db

Assigning routing protocols to a wireless controller

1. In the **Wireless Controller** screen, click **Routing Protocols** in the navigation pane.
2. Enter **0.0.0.0** for the **Destination Address** and **0.0.0.0** for the **Subnet Mask**. Add the appropriate address for the **Gateway**.
3. Click the **Save** button.



If dynamic routing (OSPF) is being used, then the default route should be set automatically. However, it is always recommended that you assign a temporary static route in dynamic environments to allow the device to operate immediately without having to wait for the initial updates. Be sure to clear the check box for **Override dynamic routes**. This will allow dynamic routes to be the default once they arrive.

The screenshot shows the Siemens HiPath Wireless Controller Configuration web interface. The browser window title is "HiPath Wireless Convergence Software - Wireless Controller Configuration - Microsoft Internet Explorer". The address bar shows "https://192.168.110.10:5825/SysMgmt/smRouting.php?sa=5a150f37bfecda27c1d8e36b62fc8db". The page title is "SIEMENS HiPath Wireless Controller Configuration". The navigation menu includes Home, Logs & Traces, Reports, Wireless Controller, Wireless APs, VNS Configuration, Mitigator, About, and LOGOUT. The left sidebar contains System Maintenance, Routing Protocols, IP Addresses, Port Exception Filters, Check Point, Mitigator, SNMP, Network Time, Management Users, Software Maintenance, Utilities, and Web Settings. The main content area is titled "View Forwarding Table" and has tabs for "Static Routes" and "OSPF". A table displays the following route:

Route #	Destination Address	Subnet Mask	Gateway	O/D
1	0.0.0.0	0.0.0.0	192.168.110.15	on

Below the table, there are input fields for "Destination Address" (0.0.0.0), "Subnet Mask" (0.0.0.0), and "Gateway" (192.168.110.15). There is a checked checkbox for "Override dynamic routes". Buttons for "Add", "Delete", "Save", and "Cancel" are present.

The footer of the page shows: [SpectraView1 | 0 days, 19:29] User: admin Port status: M Software: Rel3.1 (3.1.1.00.09) | Tracing: Inactive © Copyright 2006 Siemens AG. All Rights Reserved.

AP registration

1. Click the **Wireless APs** button.
2. Click **AP registration** in the navigation pane.
3. Enter all information for your APs (see screen shot below). Make sure the setting for **Security Mode** is selected to **Allow all Wireless APs to Connect**.
4. Click the **Save** button.



This setting allows new APs to be added to the system automatically. Once the addition of APs is complete, it is recommended to switch this setting back to **Allow only approved Wireless APs to connect**.

HiPath Wireless AP

Home | Logs & Traces | Reports | Wireless Controller | **Wireless APs** | VNS Configuration | Mitigator | About | LOGOUT

+ 192.168.10.1 (P)
 AP Multi-edit
 Client Management
 Access Approval
 AP Maintenance
AP Registration
 DRM
 BBK
 BBKWEF
 data

Wireless AP Registration

Registration Mode:
 Stand-alone
 Paired

Wireless Controller IP Address:

Default Failover VNS:

Current Wireless Controller is primary connection point

Security Mode:
 Allow all Wireless APs to connect
 Allow only approved Wireless APs to connect

Discovery Timers:
 Number of retries:
 Delay between retries: (1 - 10 seconds)

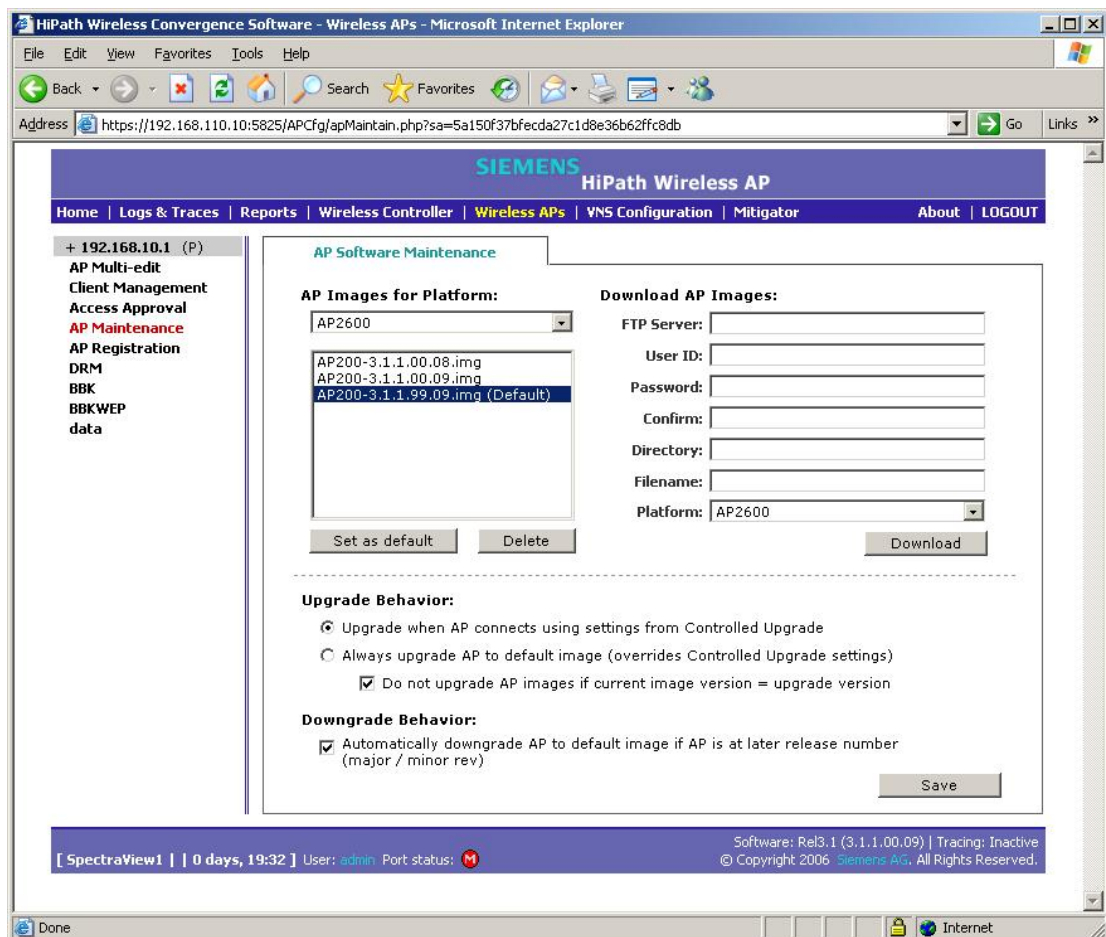
Telnet Access:
 Password:
 Confirm password:

Allow dynamic port assignment

[SpectraView1 | 0 days, 19:30] User: admin Port status: M Software: Rel3.1 (3.1.1.00.09) | Tracing: Inactive
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AP maintenance

1. In the **Wireless APs** screen, click **AP Maintenance** in the navigation pane.
2. Select the proper image file in the **AP Images** box and click the **Set as default** button.
3. Under **Upgrade Behavior** select the **Upgrade when AP connects using settings from Controlled Upgrade**. Option.
4. Select the **Do not upgrade AP images if current image version = upgrade version** check box.
5. Under **Downgrade Behavior**, select the **Automatically downgrade AP to default image if AP is at later release number (major/minor rev)** check box.
6. Click the **Save** button.



Setting up SSID, Security and QOS

1. Click the **VNS Configuration** button.
2. Click the **Topology** tab.
3. Assign a subnet for clients for a specific SSID.
4. Under **DHCP Settings**:
 - a. Enter the appropriate address for the **Gateway**
 - b. For **Mask** enter **255.255.255.0**.
 - c. The address range should default to **192.168.121.2 – 192.168.121.254**.
Change this if you want a limited range of addresses assigned to this subnet.
 - d. No DNS Servers or WINS is required.
5. Set the **Timeout Idle: pre** and **post** to **2**.
6. Under **Next Hop Routing**, set the **OSPF Route Cost** to **50000**.
7. Enter an **SSID** name.
8. Under **Wireless APs**, select the **b/g** check box for each AP.
9. Click the **Save** button.

The screenshot displays the Siemens HiPath Virtual Network Configuration web interface. The browser window title is "HiPath Wireless Convergence Software - VNS Configuration - Microsoft Internet Explorer". The address bar shows the URL: "https://192.168.110.10:5825/NtwkCfg/NtwkCfg.php?sa=5a150f37bfecda27c1d8e36b62ffc8db".

The main content area is titled "SIEMENS HiPath Virtual Network Configuration" and includes a navigation menu with options: Home, Logs & Traces, Reports, Wireless Controller, Wireless APs, VNS Configuration, Mitigator, About, and LOGOUT. The "VNS Configuration" tab is active.

The interface shows the configuration for a Virtual Network named "BBK". The "Global Settings" section on the left lists "Virtual Network BBK" and "data".

The "Topology" tab is selected, showing the following settings:

- Network Assignment:**
 - Assignment by: SSID (dropdown)
 - Allow mgmt traffic
 - Use 3rd Party AP
 - Use DHCP relay
 - Bridge Traffic Locally
- DHCP Settings:**
 - Gateway: 192.168.121.1
 - Mask: 255.255.255.0
 - Address Range: from: 192.168.121.2 to: 192.168.121.254
 - Exclusion(s):
 - Broadcast Address: 192.168.121.255
 - Domain Name:
 - Lease (seconds): default: 36000 max: 2592000
 - DNS Servers:
 - WINS:
- Timeout (mins):**
 - Idle: pre: 2
 - post: 2
 - Session: 0
- Next Hop Routing:**
 - Next Hop Address:
 - OSPF Route Cost: 50000
 - * routing table/default cost used if not specified
 - Disable OSPF Advertisement
 - SSID: BBK
 - Suppress SSID
- Wireless APs:**
 - b/g: Spectra 1, Spectra 4
 - a: Spectra 1, Spectra 4

Buttons for "Save" and "Cancel" are located at the bottom right of the configuration area.

The footer of the interface displays: "[SpectraView1 | 0 days, 19:42] User: admin Port status: [Red Circle with M] Software: Rel3.1 (3.1.1.00.09) | Tracing: Inactive © Copyright 2006 Siemens AG. All Rights Reserved."

Filtering

1. In the **VNS Configuration** screen, click the **Filtering** tab.
2. Select **Default** from the **Filter ID** drop-down list.
 - a. Select all 3 options, **In**, **Out** and **Allow**.
 - b. Leave the **IP:Port** as ***.*.*.***.
3. Select **Non-Authenticated** in the **Filter ID** drop-down list.
 - a. Select all 3 options, **In**, **Out** and **Allow**.
 - b. Leave the **IP:Port** as ***.*.*.***.
4. Click the **Save** button.



A more secure setup for this topology might be:

Allow 192.168.121.* UDP
 Allow 192.168.110.* UDP
 Allow 192.168.123.* UDP
 Disallow *.*.*.* N/A T

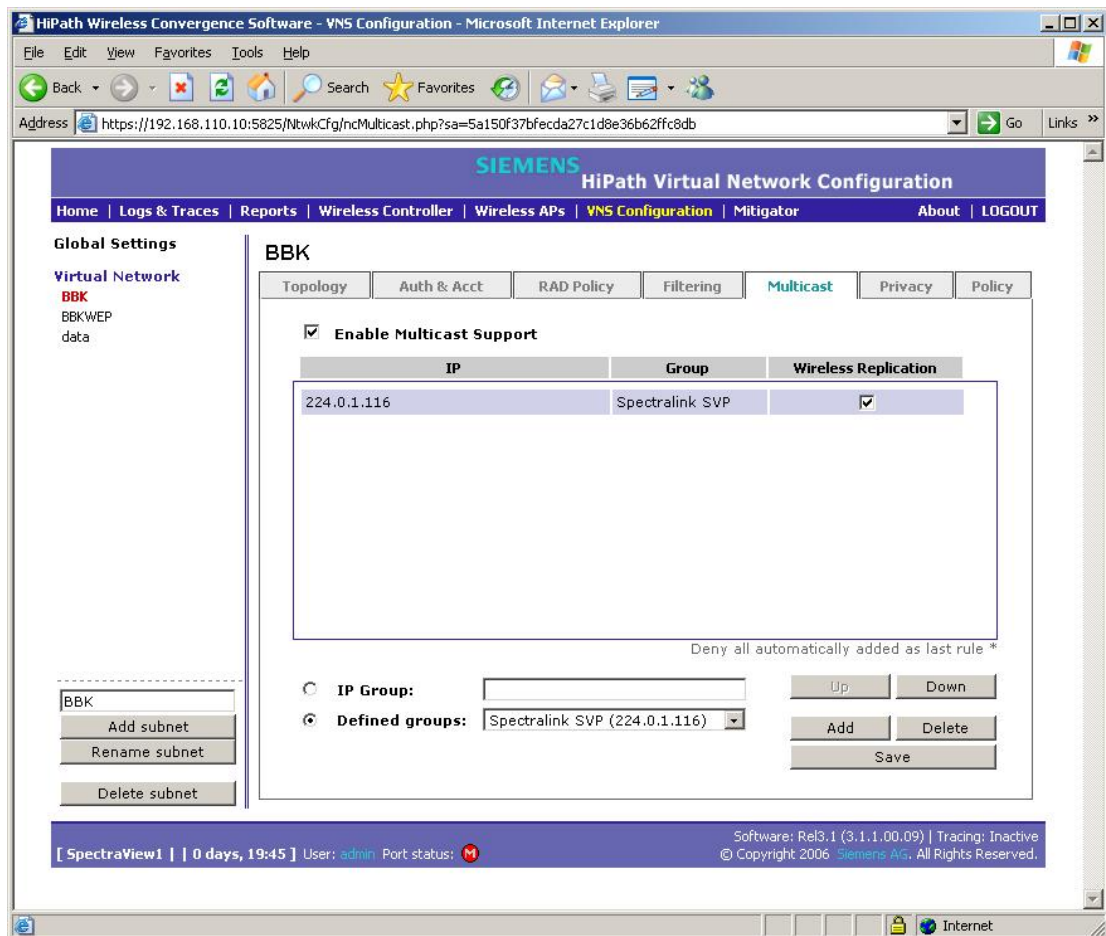
The screenshot shows the 'Filtering' tab in the configuration interface. The 'Filter ID' is set to 'Default'. A table lists the filter rules:

In	Out	Allow	IP : Port	Protocol
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	*.*.*.*	N/A

Below the table, the 'IP/subnet:port' field is set to *.*.*.* and the 'Protocol' is set to N/A. The 'Save' button is visible at the bottom right of the configuration area.

Multicast configuration

1. In the **VNS Configuration** screen, click the **Multicast** tab.
2. Select the **Enable Multicast Support** check box.
3. From the **Defined groups** drop-down list, select or enter **Spectralink SVP (224.0.1.116)** and click the **Add** button.
4. Enable **Wireless Replication** for the multicast selection by selecting the check box beside the entry.
5. Click the **Save** button.



Security

1. In the **VNS Configuration** screen, click the **Privacy** tab.
2. For WPA2 AES-CCKM, click the **WPA-PSK** option, clear the **WPA v.1** check box, then select the **WPA v.2** check box.
3. For WPA TKIP, click the **WPA-PSK** option, clear the **WPA v.2** check box, then select the **WPA v.1** check box.
4. Enter the appropriate pass phrase in the **Pre-shared key** field.
5. Click the **Save** button.



There is no hex key available at this time.

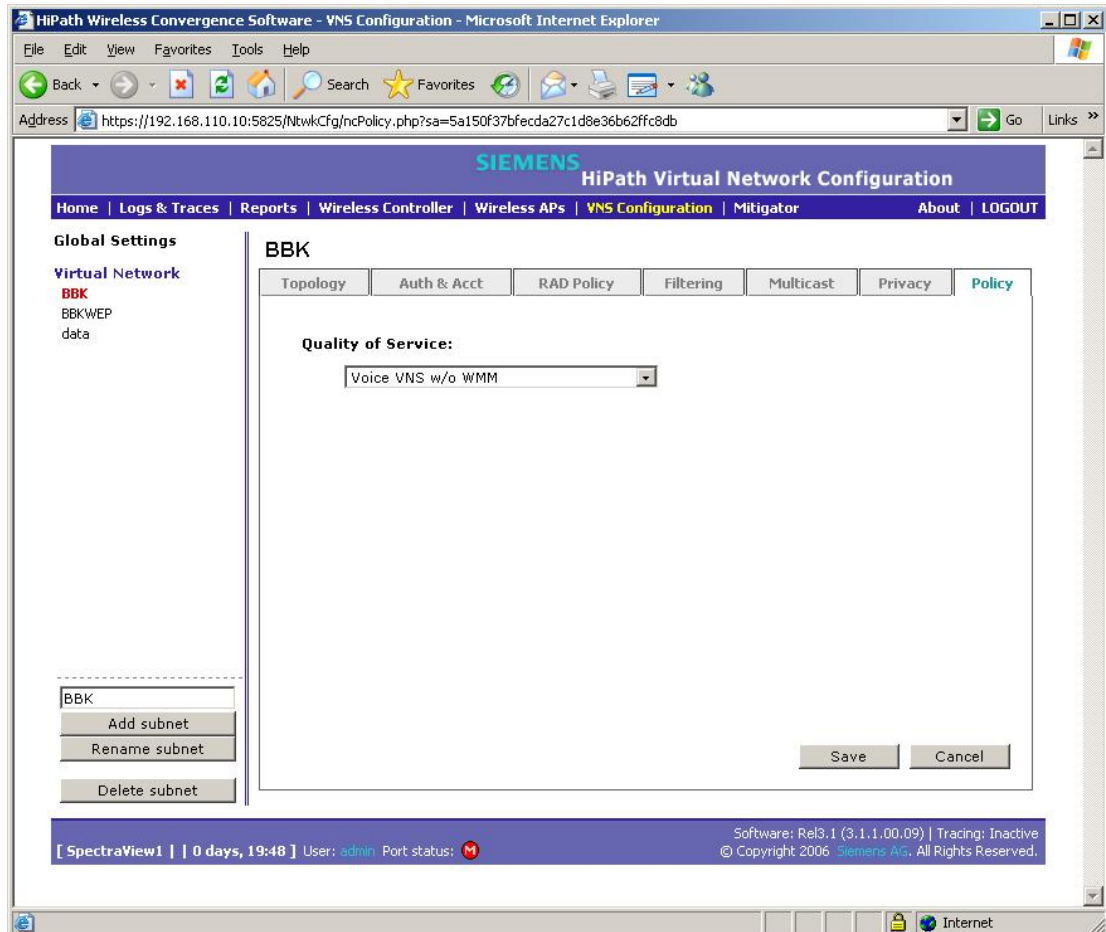
The screenshot shows the Siemens HiPath Virtual Network Configuration web interface. The browser window title is "HiPath Wireless Convergence Software - VNS Configuration - Microsoft Internet Explorer". The address bar shows "https://192.168.110.10:5825/NetworkCfg/ncPrivacy.php?sa=bc1132e89fe274b726d8c777651292b8". The page title is "SIEMENS HiPath Virtual Network Configuration". The navigation menu includes "Home", "Logs & Traces", "Reports", "Wireless Controller", "Wireless APs", "VNS Configuration", "Mitigator", "About", and "LOGOUT". The "VNS Configuration" tab is active, and the "Privacy" sub-tab is selected. The main content area is titled "BBK" and contains the following configuration options:

- None
- Static Keys (WEP)
- WPA - PSK
 - WPA v.1
 - Encryption: TKIP only
 - WPA v.2
 - Encryption: AES only
 - Broadcast re-key interval: 3600 seconds (30 - 86400 seconds)
 - Pre-shared key: [masked] Unmask
 - (min 8 characters; max 63)

Buttons for "Save" and "Cancel" are located at the bottom right of the configuration area. The footer of the page displays: "[SpectraView1 | C10 | 0 days, 3:46] User: admin Port status: [red icon] Software: Rel3.1 (3.1.4.03.03) | Tracing: Inactive © Copyright 2006 - Siemens AG, All Rights Reserved."

Quality of service

1. In the **VNS Configuration** screen, click the **Policy** tab.
2. From the **Quality of Service** drop-down list, select **Voice VNS w/o WMM**; this is required for SpectraLink phones.
3. Click the **Save** button.



Setting up Other SSIDs

1. Repeat the above steps, starting at step 1.
2. Create a new SSID and DHCP pool as before. Each SSID has its own sub-net.
3. Use the same filtering settings as before.
4. Set up privacy as required.
5. If creating a sub-net for data, select **Best Effort** in the **Policy** page.

Make sure the proper SSID is selected on each page as it is being configured.

Connecting access points to the controller

1. Click the **Reports** button.
2. Make sure the controller is configured to accept new APs (this is selected by default).
3. Physically connect the access points to the system one at a time. Once an AP is connected to the system, it will show up in the **Active Wireless APs** screen of the **Reports** menu. Press F5 to refresh the screen.

Active Wireless APs - 192.168.10.1 Data as of Feb 08, 2006 03:36:51 pm

Wireless AP	Serial	AP IP	Clients	Home	Tunnel Duration	Packets Sent	Packets Rec'd	Bytes Sent	Bytes Rec'd	Uptime	802.11b/g Ch/Tx	802.11a Ch/Tx
Spectra 1	0500005230000966	192.168.110.12	10	Local	19:36:28	33972015	33891835	5780913786	5776808965	19:35:13	10/4%	a off
Spectra 4	0500005230001142	192.168.123.11	0	Local	0:00:12	0	0	0	0	n/a	auto/0%	a off
Summary	2 active APs		10									

Refresh every seconds

Wireless APs address assignment

1. After all the APs have been connected and discovered by the controller, click **Wireless APs** tab.
2. Click the **Static Configuration** tab.
3. Select an AP to configure. The AP's name will default to their MAC address.
4. Under **IP Address Assignment** click either the **Use DHCP** or the **Static Values** option. If selecting **Static Values**, assign the proper values.
5. Under **Wireless Controller Search List** add the IP address of the controller port.
6. Repeat steps 4 and 5 for each access point.
7. Click the **Save** button.

For each AP, follow the steps in the following sections.

AP properties

1. In the **Wireless APs** screen, click the **AP Properties** tab. Select an AP to configure. Here you can assign a meaningful name to each AP.
2. Enable **Telnet Access**. This is useful for troubleshooting the setup and configuring security settings.

SIEMENS HiPath Wireless AP

Home | Logs & Traces | Reports | Wireless Controller | **Wireless APs** | VNS Configuration | Mitigator | About | LOGOUT

+ 192.168.10.1 (P) Spectra 1
Spectra 4

AP Properties | 802.11b/g | 802.11a | Static Configuration

Serial #: 0500005230000966
Name: Spectra 1
Description: 0500005230000966
Port #: esa0 (192.168.110.10)
Hardware Version: Siemens Wireless AP 2610 R3.0 internal
Application Version: 3.1.1.99.09
Status: Approved
Active Clients: 0

Poll Timeout: 10 seconds
Poll Interval: 2 seconds
Telnet Access: Enable
 Maintain client sessions in event of poll failure
 Use broadcast for disassociation

Country: United States
** Change of Country will cause the AP to reboot*

Add Wireless AP Save

[SpectraView1 | 0 days, 0:09] User: admin Port status: M Software: Rel3.1 (3.1.1.00.09) | Tracing: Inactive
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javascript:tabChange("Tab0"); Internet

802.11b/g settings

1. In the **Wireless APs** screen, select the **802.11 b/g** tab.
2. Select an AP to configure.
3. Under **Base Settings**:
 - a. Set the **DTIM Period** to **3**.
 - b. Set the **Beacon Period** to **100**.
 - c. Set the **RTS/CTS Threshold** to **2346**.
 - d. Set the **Frag. Threshold** to **2346**.
4. For Enable Radios, select the 802.11b check box.
5. Under **Radio Settings**:
 - a. Select the appropriate **Channel** and **Tx Power Level**.
(Note: DRM values will override this setting, if enabled).
 - b. Set the **Diversity** to **Best**.
 - c. Set the **Min Basic Rate** to **1 Mbps**.
 - d. Set the **Max Basic rate** to **11Mbps**.
 - e. Set the **Max Operational Rate** to **11Mbps**.
 - f. Set the **Preamble** to **Short** (note that the value **Long** works as well).
6. Click the **Save** button.

The screenshot displays the Siemens HiPath Wireless AP configuration web interface. The top navigation bar includes links for Home, Logs & Traces, Reports, Wireless Controller, Wireless APs, VNS Configuration, Mitigator, About, and LOGOUT. The main content area is titled 'AP Properties' and shows the configuration for the '802.11b/g' tab. The 'Base Settings' section includes fields for DTIM Period (3), Beacon Period (100), RTS/CTS Threshold (2346), and Frag. Threshold (2346). The 'Enable Radios' section shows the 802.11b radio checked and 802.11g unchecked. The 'Radio Settings' section includes dropdown menus for Channel (2: 2417 MHz), Tx Power Level (Min), Diversity (Best), Min Basic Rate (1 Mbps), Max Basic Rate (11 Mbps), Max Operational Rate (11 Mbps), and various retry counts for different traffic types. The 'g Radio Settings' section includes a Protection Mode dropdown set to Auto. A status bar at the bottom indicates 'AP static configuration updated successfully' and provides software version and copyright information.

Enable the radio

1. Click the **VNS Configuration** button.
2. Click the **Topology** tab.
3. Enable each AP's b/g radio for each SSID.
4. Set **No. of Retries for Voice VO** to **adaptive (multi-rate)** and **No. of Retries for Turbo Voice TVO** to **2**.
5. Click the **Save** button..



After the controller and access points are set up, the Management port is no longer required. The Controller can now be managed through the Host Port, or the esa0 port in this configuration. Open a browser and connect to <https://<ip address>:5825>.