NetLink SVP Server

Installation, Setup, and Maintenance
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Important Safety Information

Follow these general precautions while installing telephone equipment:
- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
DECLARATION OF CONFORMITY

We, SpectraLink Corporation
5755 Central Avenue
Boulder, CO 80301
declare under sole responsibility that the Wireless Business Telephone System Components:
   Wireless Telephone Handset Models; SNP2400, RNP2400
   Battery Models; BPE100, BPX100
   System Controller Models; TGA-116, TGU-116, TGA-104, TGU-104, SVP100
   Battery Charger Models; BQC7204, DCE100, DCX100
LVD Directive 73/23/EEC.
Compliance was demonstrated to the following specifications as listed in the official Journal of the
European Communities:
   EN 61000-6-4:2001 Industrial Emissions:
     EN 55022:1994+ A1 Emissions Class A
     (SVP100, TGA/TGU-104 & respective power supplies)
   EN 55024:1998 Immunity
   EN 300-328-1 V1.3.1 2001 ERM
   EN 300-489-1/17: 2002 Common, EMC, ERM, RLAN (Class B for Handsets)
   EN 300-826 ERM/EMC
   EN 50360:2001 SAR
   EN 61000 6-2:2001 Immunity
   EN 61000 3-2:2000 Harmonic Emissions
   EN 61000 3-3:1995 Flicker Emissions
   EN 60950:2000 Safety with CB Reports

Mark R. Angliss,
Manager; Quality & Process Engineering, For the SpectraLink Corporation

May 23, 2003
PN 72-0096-00 Rev D
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<th>Page</th>
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<td>37</td>
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</table>
1. **About This Document**

This document explains how to configure and maintain the NetLink SVP Server within the telephony system.

1.1 **Questions?**

SpectraLink wants you to have a successful installation. If you have questions please contact **SpectraLink Customer Support Hotline at (800) 775-5330.**

The Hotline is open Monday through Friday, 5:00 AM to 7:00 PM Mountain Time.

1.2 **Icons and Conventions**

This manual uses the following icons and conventions.

- **Caution!** Follow these instructions carefully to avoid danger.

- **Note** these instructions carefully.

- **NORM** This typeface indicates a key, label, or button on the NetLink SVP Server or Wireless Telephone.
2. NetLink SVP Server Overview

SpectraLink Voice Priority (SVP) is the SpectraLink quality of service (QoS) mechanism that is implemented in the Wireless Telephone and access point (AP) to enhance voice quality over the wireless network. SVP gives preference to voice packets over data packets on the wireless medium, increasing the probability that all voice packets are transmitted efficiently and with minimum delay. SVP is fully compliant with the IEEE 802.11, 802.11b, 802.11e and 802.11i standards.

The NetLink SVP Server is an Ethernet LAN device that works with the AP to provide QoS on the wireless LAN. Voice packets to and from the NetLink Wireless Telephones are intercepted by the NetLink SVP Server and encapsulated for prioritization as they are routed to and from an IP telephony server or gateway.

NetLink Wireless Telephones support the 802.11e protocol including basic WMM™ and the optional admission control if these are in turn supported by the AP. If the AP supports WMM, the Wireless Telephone automatically discovers and uses it. WMM does not replace the NetLink SVP Server.

2.1 Multiple SVP Servers

Multiple SVP Server environments are those which have more than one NetLink SVP Server in the same subnet in order to accommodate larger systems and higher call capacity.

In a system comprised of multiple SVP Servers using an IP protocol, a master SVP Server must be identified. The master SVP Server must have a static IP address. The Wireless Telephones and the other SVP Servers locate the master by using a static IP address, DHCP, or DNS. The loss of a non-master SVP Server does not significantly affect the operation of the remaining SVP Servers. However, the loss of the master SVP Server results in a loss of all communication between all of the SVP Servers. This also means that the loss of the master SVP results in the loss of all active calls and Wireless Telephones cannot check-in until communication with master is reestablished.

In a NetLink Telephony Gateway system using multiple SVP Servers, there is no “master” server.
2.2 The Timing Function

In the NetLink Gateway environment, SVP Servers provide the "timing" function for active calls. In multiple SVP Server environments, the active calls are distributed across the SVP Servers. In the IP PBX environment, SVP Servers provide both the connection or "gateway" to the IP PBX for the Wireless Telephones and the "timing" function for active calls. This "gateway" function is distributed across the SVP Servers.

In both environments, the number of active SVP Servers is determined dynamically. Whenever SVP Servers are added to or removed from the system, the distribution of "timing" function for active calls, as well as the "gateway" function in the IP PBX environment, is affected.

In a NetLink Gateway environment, the addition of an SVP Server is detected as soon as the new SVP Server is up and running. The new SVP Server will immediately start providing the “timing” function for the appropriate Wireless Telephones. The user should not detect any change. The removal of an SVP Server is detected within one minute. During this time, any Wireless Telephone that was using the SVP Server that was removed will be affected. If the Wireless Telephone was not in a call, it may lose contact with its Gateway, resulting in a check-out/check-in sequence. If the Wireless Telephone was in a call, the audio will be lost and the call will be dropped.

2.3 Internal Gatekeeper

A gatekeeper is required in certain H.323 protocol systems. The gatekeeper that resides on the SVP Server is designed for small applications using the NetLink Wireless Telephones under the H.323 protocol as explained in NetLink e340/i640 Wireless Telephone—With ITU H.323 Protocol: Setup and Maintenance.

The internal gatekeeper is not designed to scale beyond the capacity of a single SVP Server and does not provide the advanced features required for larger installations. It has a limit of 1000 registration records.
2.4 NetLink SVP Server Capacity

The NetLink SVP Server requires a Cat. 5 cable connection between its network port and the Ethernet switch. The NetLink SVP Server auto-negotiates to the type of port on the Ethernet switch and supports 10Base-T, 100Base-T, full-duplex and half-duplex port types.

The maximum number of calls a single NetLink SVP Server is able to handle depends on LAN factors per the following table:

<table>
<thead>
<tr>
<th></th>
<th>Supported Calls</th>
<th>Number of Wireless Telephones Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10Base-T</td>
<td>100Base-T</td>
</tr>
<tr>
<td>IP Gateway</td>
<td>10</td>
<td>80</td>
</tr>
<tr>
<td>NetLink Telephony Gateway</td>
<td>10</td>
<td>120</td>
</tr>
</tbody>
</table>

Multiple SVP Servers can be used in both NetLink Telephony Gateway and IP system environments.

The table below shows the capacity of NetLink Telephony Gateways in a multiple SVP Server environment.

<table>
<thead>
<tr>
<th>SVP Servers</th>
<th>Calls per server</th>
<th>Total Calls</th>
<th>Gateways</th>
<th>Erlangs</th>
<th>15% use</th>
<th>25% use</th>
<th>50% use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120</td>
<td>120</td>
<td>15</td>
<td>103</td>
<td>240</td>
<td>240</td>
<td>206</td>
</tr>
<tr>
<td>2</td>
<td>120</td>
<td>240</td>
<td>30</td>
<td>219</td>
<td>480</td>
<td>480</td>
<td>438</td>
</tr>
<tr>
<td>3</td>
<td>120</td>
<td>320</td>
<td>40</td>
<td>336</td>
<td>640</td>
<td>640</td>
<td>640</td>
</tr>
</tbody>
</table>

The table below shows the capacity of an IP Gateway in a multiple SVP Server environment.

<table>
<thead>
<tr>
<th>SVP Servers</th>
<th>Calls per server</th>
<th>Total Calls</th>
<th>Erlangs</th>
<th>10% use</th>
<th>15% use</th>
<th>20% use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>80</td>
<td>80</td>
<td>65</td>
<td>500</td>
<td>433</td>
<td>325</td>
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<tr>
<td>2</td>
<td>64</td>
<td>128</td>
<td>111</td>
<td>1000</td>
<td>740</td>
<td>555</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>180</td>
<td>160</td>
<td>1500</td>
<td>1067</td>
<td>800</td>
</tr>
<tr>
<td>4</td>
<td>58</td>
<td>232</td>
<td>211</td>
<td>2000</td>
<td>1407</td>
<td>1055</td>
</tr>
<tr>
<td>5</td>
<td>57</td>
<td>285</td>
<td>262</td>
<td>2500</td>
<td>1747</td>
<td>1310</td>
</tr>
<tr>
<td>6</td>
<td>56</td>
<td>336</td>
<td>312</td>
<td>3000</td>
<td>2080</td>
<td>1560</td>
</tr>
<tr>
<td>7</td>
<td>56</td>
<td>392</td>
<td>367</td>
<td>3500</td>
<td>2447</td>
<td>1835</td>
</tr>
<tr>
<td>8</td>
<td>55</td>
<td>440</td>
<td>415</td>
<td>4000</td>
<td>2767</td>
<td>2075</td>
</tr>
<tr>
<td>9</td>
<td>55</td>
<td>495</td>
<td>469</td>
<td>4500</td>
<td>3127</td>
<td>2345</td>
</tr>
<tr>
<td>10</td>
<td>55</td>
<td>550</td>
<td>524</td>
<td>5000</td>
<td>3493</td>
<td>2620</td>
</tr>
<tr>
<td>11</td>
<td>55</td>
<td>605</td>
<td>578</td>
<td>5500</td>
<td>3853</td>
<td>2890</td>
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<tr>
<td>12</td>
<td>54</td>
<td>648</td>
<td>621</td>
<td>6000</td>
<td>4140</td>
<td>3105</td>
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<td>54</td>
<td>702</td>
<td>674</td>
<td>6500</td>
<td>4493</td>
<td>3370</td>
</tr>
<tr>
<td>14</td>
<td>54</td>
<td>756</td>
<td>728</td>
<td>7000</td>
<td>4853</td>
<td>3640</td>
</tr>
<tr>
<td>15</td>
<td>54</td>
<td>810</td>
<td>782</td>
<td>7500</td>
<td>5213</td>
<td>3910</td>
</tr>
<tr>
<td>16</td>
<td>54</td>
<td>864</td>
<td>836</td>
<td>8000</td>
<td>5573</td>
<td>4180</td>
</tr>
</tbody>
</table>

1 Limited by the eight simultaneous calls supported by each NetLink Telephony Gateway.
2.5 Notes on System Configuration

In an IP system using subnets to differentiate telephony areas, each subnet must have its own SVP Server as well as access points. This is not considered a multiple SVP Server environment since the SVP Servers are separated by the subnet architecture. Multiple SVP Server environments are those which have more than one SVP Server in the same subnet in order to accommodate a high volume of wireless telephony traffic.

Wireless Telephones cannot roam between subnets. Any call in progress will be dropped when the user moves out of range. In order to resume functionality in the new subnet area, the user must power cycle the Wireless Telephone. Once the Wireless Telephone achieves communication within the new subnet, normal functionality will return.

Subnets are not recommended in NetLink Telephony Gateway environments.

IP multicast addresses are used by the NetLink i640 Wireless Telephone system. This requires that multicasting be enabled on the subnet used for the NetLink Wireless Telephones, SVP Server, and Telephony Gateways.

Routers are typically configured with filters to prevent multicast traffic from flowing outside of specific domains. The wireless LAN can be placed on a separate VLAN or subnet to reduce the effects of broadcast and multicast traffic from devices in other network segments.
2.6 System Diagram

The following diagram shows the NetLink SVP Server residing on a network with an IP telephony server, wireless LAN access points, and Ethernet switch:
NetLink SVP Server

Ethernet Switch

NetLink Telephony Gateway

NetLink Telephony Gateway

NetLink Telephony Gateway

NetLink Telephony Gateway

NetLink Telephony Gateway

Demarc block

PBX

Administrative computer

access point

Wireless POS

Wireless Telephones

access point

Device supplied by SpectraLink

CAT 5 cable

25 pair cable

Multiple phone cables

Phone cable

desksets

(NetLink Telephony Gateway system example)
2.7 System Components

- **NetLink e340 and i640 Wireless Telephones** – Employees can carry Wireless Telephones to make and receive calls as they move throughout the building. The Wireless Telephones are to be used on-premises; they are not cellular or satellite phones. They are connected to the facility's existing telephone system and to the NetLink Telephony Gateway or IP gateway. Just like wired telephones, they can receive calls directly, receive transferred calls, transfer calls to other extensions, and make outside and long distance calls (subject to the restrictions applied in your facility.)

The NetLink e340, i340 Wireless Telephone is a lightweight, durable handset specifically designed for mobile workplace use within a facility. The NetLink i640 Wireless Telephone offers a durable design with push-to-talk functionality.

NetLink Wireless Telephones can operate on an 802.11b wireless network and can operate at a transmission rate of up to 11Mb/s.

- **NetLink Telephony Gateway** – serves as the connecting point, or gateway, between the LAN and the existing telephone system. One or more NetLink Telephony Gateways are typically installed in the telephone equipment room. Each NetLink Telephony Gateway supports up to 16 telephone lines and Wireless Telephones. Up to 40 NetLink Telephony Gateways can be connected to the LAN to support additional telephone lines. If five or more NetLink Telephony Gateways are connected to the LAN, a NetLink SVP Server must be installed to handle the increased call volume.

SpectraLink offers digital NetLink Telephony Gateways that work with the digital ports on most common brands of telephone systems (PBX or key systems). We also offer an analog NetLink Telephony Gateway that works with telephone systems (CO, PBX, or Key Systems) with analog (loop start) ports.

- **Access Points** – supplied by third party vendors, access points provide the connection between the wired Ethernet LAN and the wireless (802.11) LAN. Access points (AP) must be positioned in all areas where Wireless Telephones will be used. The number and placement of access points will affect the coverage area and capacity of the wireless system. Typically, the requirements for use of NetLink Wireless Telephones are similar to that of wireless data devices. Contact SpectraLink, or a certified SpectraLink distributor, for specific information about your facility’s needs.

The NetLink system must connect to access points that utilize SpectraLink Voice Priority (SVP). Contact SpectraLink, or a certified SpectraLink distributor, to verify that your AP and its software version are supported.

- **Ethernet Switch** – a component in the wired Ethernet LAN infrastructure. Switches interconnect multiple network devices, including access points and NetLink Telephony Gateways. Ethernet switches are required to provide the higher performance network connections needed to handle combined voice and data traffic.
• **Router** – an optional component in the wired Ethernet LAN infrastructure that separates a wired LAN into segments so that network traffic is restricted to those segments that are directly involved in the communication. Installation of a network router is recommended in larger networks, where there may be significant network traffic not related to the wireless LAN. A router will isolate the wireless LAN from the associated wired LAN so that they are not impacted by each others’ traffic. The NetLink Telephony Gateways, the APs, and their associated Ethernet switch must all be on the same “side” of the router.

• **NetLink SVP Server** – the NetLink SVP Server manages call network traffic. It is a required component to utilize the 11Mb/s maximum transmission speed available in the NetLink Wireless Telephone. It is required in any system when five or more NetLink Telephony Gateways are connected to the LAN. With 40 NetLink Telephony Gateways cabled together, the NetLink SVP Server supports a maximum of 640 telephone lines and 120 simultaneous Wireless Telephone calls.

SpectraLink Voice Priority (SVP) is the SpectraLink quality of service (QoS) mechanism that is implemented in the Wireless Telephone and AP to enhance voice quality over the wireless network. SVP gives preference to voice packets over data packets on the wireless medium, increasing the probability that all voice packets are transmitted efficiently and with minimum or no delay. SVP is fully compliant with the IEEE 802.11 and 802.11b standards.

• **Administrative computer** – Required for setup and maintenance of the NetLink Telephony Gateway and the NetLink SVP Server. This computer may be temporarily connected directly to the component or to the network, a dedicated computer is not required. Some installations use a laptop to configure and maintain system components.

• **TFTP Server** – Required in an IP system to distribute software to the Wireless Telephones and SVP Server. May be on a different subnet than the IP gateway, IP telephony server, and APs.
2.8 The Front Panel of the NetLink SVP Server

The NetLink SVP Server’s front panel contains ports to connect to power, the LAN, and an administrative computer via an RS-232 port. Status LEDs supply information about the NetLink SVP Server’s functioning.

**RS-232 Port** – male DB-9 connector (DTE) used for RS-232 connection to a terminal, terminal emulator, or modem for system administration.

**LEDs:**

- **LNKOK** – lit when there is a network connection.
- **ACT** – lit if there is system activity.
- **COL** – lit if there are network collisions.
- **NETWORK** – connects to wired (Ethernet) LAN.
- **ERROR** – lit when the system has detected an error.
- **STATUS** – indicate system error messages and status.
  - **1** – heartbeat, indicates gateway is running.
  - **2** – if active calls.
  - **3, 4, 5** – currently unused

**PWR (power jack)** – connects to the AC adapter supplying power to the system.

Use only the SpectraLink-provided Class II AC Adapter with output 24VDC, 1A.
3. Installing the NetLink SVP Server

As shown in the system diagram the NetLink SVP Server is connected to the Ethernet switch. The specifications covered here allow for great flexibility in physical placement of the components within stated guidelines.

See the Setup and Administration document for your vendor’s IP system for information on LAN requirements, network infrastructure and IP addressing.

3.1 Required Materials

The following equipment must be provided by the customer.

- **Power Outlet** – must accept SpectraLink provided AC adapter.
- **Backboard space** – the NetLink SVP Server is designed to be wall mounted to ¾” plywood securely screwed to the wall.
- **Screws** – required to mount the NetLink SVP Server to the wall. Four #8 - ¾” panhead wood screws (or similar device) are required.
- **Cat. 5 Cable** – RJ-45 connector at the NetLink SVP Server. Connection to Ethernet switch.

3.2 Locate the NetLink SVP Server

The NetLink SVP Server measures approximately 4 x 12.5 x 7 inches, and weighs about five pounds. The unit can be wall mounted, vertically or horizontally, over ¾” plywood. The SVP Server can also be rack mounted using a rack mount kit (sold separately).

Locate the NetLink SVP Server in a space with:
- Sufficient backboard mounting space (for wall mount) and proximity to the LAN access device (switched Ethernet hub) and power source.
- Easy access to the front panel, which is used for cabling.
- A maximum distance of 325 feet (100 meters) from the Ethernet switch.

3.3 Install the NetLink SVP Server

Mount the SVP Server to rack

The rack mount kit is designed for mounting equipment in a standard 19 inch rack and should contain the following equipment:
- Mounting plates – two for each SVP Server to be mounted.
- Screws – four rack mount screws for each SVP Server to be mounted.

To rack mount the NetLink SVP Server:
1. Remove the corner screws from the SVP Server
2. Screw the U-shaped end (round screw holes) of the two mounting plates to the SVP Server.
3. Screw the other end of the two mounting plates (oblong screw holes) to the rack.

4. Repeat steps 1-3 for each additional SVP Server. The mounting plate is designed to provide the correct minimum spacing between units. When mounting multiple units, stack the units in the rack as closely as possible.

**Mount the NetLink SVP Server to wall**

The NetLink SVP Server can be mounted either horizontally or vertically.

To mount the NetLink SVP Server:

1. Using a 1/8 inch drill bit, drill four pilot holes, on 1.84 by 12.1 inch centers (approximately equivalent to 1-13/16 inch by 12-1/8 inch).

2. Insert the #8 x 3/4 inch screws in the pilot holes and tighten, leaving a 1/8 to 1/4 inch gap from the wall.

**Connect NetLink SVP Server to LAN**

Using a Cat. 5 cable, connect the NETWORK port on the NetLink SVP Server to the connecting port on the Ethernet switch.

**Connect Power**

1. Connect the power plug from the AC adapter to the jack labeled PWR on the NetLink SVP Server.

   ![Warning]

   Use only the provided Class II AC Adapter with output 24VDC, 1A.

2. Plug the AC adapter into a 110VAC outlet to apply power to the NetLink SVP Server.

3. The system will cycle through diagnostic testing and the LEDs will blink for about one minute. When the system is ready for use:
   - The **ERROR** LED should be off.
   - **Status 1** should be blinking.

After the NetLink SVP Server is installed, you must configure the NetLink Wireless Telephones. For Wireless Telephone configuration, see the *Setup and Administration* document for your vendor’s IP system.
4. Configuring the NetLink SVP Server

During initial setup of the NetLink SVP Server the IP address is established and the maximum number of active calls per access point is set. Optionally, you may enter a hostname and a location for software updates via TFTP.

4.1 Connecting to the NetLink SVP Server

The initial connection to the NetLink SVP Server must be made via a serial connection to establish the NetLink SVP Server’s IP address. After the IP address is established, connection to the NetLink SVP Server may be done via the network using Telnet. It is recommended that the basic setup actions occur while the serial connection is made.

Connect via the Serial Port

1. Using a DB-9 female, null-modem cable, connect the NetLink SVP Server to the serial port of a terminal or PC.
2. Run a terminal emulation program (such as HyperTerminal™) or use a VT-100 terminal with the following configuration:
   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None
3. Press Enter to display the NetLink SVP Server login screen.
4. Enter the default login: admin and default password: admin. These are case sensitive.
5. The NetLink SVP-II System menu will display.

Connecting Via Telnet

Telnet can only be used after the NetLink SVP Server’s IP address is configured.

The Telnet method of connection is used for routine maintenance of the NetLink Server for both local and remote administration, depending on your network.

To connect via Telnet, run a Telnet session to the IP address of the NetLink SVP Server. Once you connect and log in, the NetLink SVP-II System menu displays.
4.2 The NetLink SVP-II System Menu

The main menu displays as shown here:

```
Netlink SVP-II System
Hostname: [SUP02_1], Address: 10.8.0.61

System Status
SVP-II Configuration
Network Configuration
Change Password
Exit

Enter=Select      ESC=Exit      Use Arrow Keys to Move Cursor
```

**System Status** – menu for viewing error messages, status of operation and software code version.

**SVP-II Configuration** – allows you to set the mode and reset the system.

**Network Configuration** – allows you to set network configuration options, including IP address and hostname.

**Change Password** – allows you to change the password for NetLink SVP Server access.

---

\(^2\) SVP-II is a designation used internally by SpectraLink Engineering.
4.3 Network Configuration

The IP address and other network settings are established via the **Network Configuration** screen. This is also where you may optionally establish a hostname and enter the IP address of the location of any software updates you may obtain from SpectraLink. See section 5, the **Software Maintenance** section, of this document for more information about installing software updates via TFTP.

Scroll to **Network Configuration** and select by pressing Enter. A screen similar to the following appears:

```
Network Configuration
Hostname: [SUPV2_1], Address: 10.0.0.61

Ethernet Address (fixed): 00:90:64:00:77:15
IP Address: 10.0.0.61
Hostname: SUPV2_1
Subnet Mask: 255.0.0.0
Default Gateway: NONE
SUP-II TFTP Download Master: 10.0.0.32
Primary DNS Server: NONE
Secondary DNS Server: NONE
DNS Domain: NONE
WINS Server: 10.13.0.1
Workgroup: WORKGROUP
Syslog Server: NONE
Maintenance Lock: N

Enter=Change  S=SendAll* ESC=Exit  Use Arrow Keys to Move Cursor
```

- **IP Address** – enter the IP address of the NetLink SVP Server, defined by your network administrator. Enter the complete address including digits and periods. **DHCP** may be entered.

  A “master” SVP Server must have a static IP address.

- **Hostname** -(optional) change the default host name, if desired. This is the name of the NetLink SVP Server to which you are connected, for identification purposes only. You cannot enter spaces in this field.

- **SUP-II TFTP Download Master** – this entry indicates the source of software updates for the NetLink SVP Server. See section 5, the **Software Maintenance** section, for more information. Valid source location entries are:
  - **NONE** – disables.

* The S=SendAll option is available only in IP system configurations.
- **IP Address** – the IP address of a network TFTP server that will be used to transfer software updates to the NetLink SVP Server.

- **DNS server** and **DNS domain** – These settings are used to configure Domain Name services. Consult your system administrator for the correct settings. These can also be set to **DHCP**. This will cause the DHCP client in the NetLink SVP Server to attempt to automatically get the correct setting from the DHCP server. The DHCP setting is only valid when the IP address is also acquired using DHCP.

- **WINS servers** – These setting are used for Windows Name Services. Consult your system administrator for the correct settings. These can also be set to **DHCP**. This will cause the DHCP client in the NetLink SVP Server to attempt to automatically get the correct setting from the DHCP server. The DHCP setting is only valid when the IP address is also acquired using DHCP.

  When the name services are set up correctly, the NetLink SVP Server can translate hostnames to IP addresses. Using Telnet, it is also possible to access the NetLink SVP Server using its hostname instead of the IP address.

- **Workgroup** – as set in WINS.

- **Syslog Server** – Logging can be set to **Syslog** or **NONE**. If Syslog is set, a message is sent to the syslog server when an alarm is triggered.

The NetLink SVP Server must be reset in order to set the configuration options. If the NetLink SVP Server is in **Maintenance Lock**, you will be prompted to reset the NetLink SVP Server upon pressing Esc. Respond with a **Y** to the reset prompt.

The NetLink SVP Server may be manually reset by selecting the **Reset** option in the **SVP-II Configuration** screen and then pressing **Y** (Yes).

**Send All**

In an IP system with multiple NetLink SVP Servers, the **SendAll** option is provided to speed configuration and ensure identical settings. The **S=SendAll** option allows you to send that configuration parameter to every NetLink SVP Server on the LAN. **SendAll** can only be used after the IP address is established on EACH NetLink SVP Server via the serial connection. If you anticipate identical settings across the LAN, set just the IP address and custom hostname (if desired) for each NetLink SVP Server using the initial serial connection. Then connect via the LAN and use **SendAll** to set identical configuration options for all NetLink SVP Servers.

If **SendAll** is to be utilized in your system, all passwords must be identical. **DO NOT CHANGE THE PASSWORD AT THE INITIAL CONFIGURATION IF THE SEND ALL OPTION IS DESIRED.** Use the default password and change it globally if desired after a LAN connection is established for all NetLink SVP Servers.

If independent administration of each NetLink SVP Server is desired, the passwords may be set at initial configuration.
To change the IP address of the master SVP Server, change it in this menu and reboot the system. Then you may change alias IP addresses in each of the other SVP Servers without error.
4.4 SVP Server Configuration

The SVP-II Configuration screen is where you set the mode of the NetLink SVP Server. It is also where you can lock the NetLink SVP Server for maintenance and reset the NetLink SVP Server after maintenance. The type of gateway you are using determines the mode of the NetLink SVP Server. For SVP-II Mode, select from either NetLink for systems using the SpectraLink NetLink Telephony Gateway or NetLink IP for systems using an IP telephony server from a third party vendor.

The NetLink SVP Server will automatically lock for maintenance if the IP address is changed. When this Maintenance Lock occurs, the NetLink SVP Server must be reset upon exit. All active calls are terminated during a reset.

From the main menu, scroll to SVP-II Configuration and select by pressing Enter.
NetLink Telephony Gateway System Configuration

The following screen displays the options for the NetLink Telephony Gateway system configuration:

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVP-II Mode:</td>
<td>Set to <strong>NetLink</strong> if using a NetLink Telephony Gateway.</td>
</tr>
<tr>
<td>Ethernet Link:</td>
<td>auto-negotiate</td>
</tr>
<tr>
<td>System Locked:</td>
<td>N</td>
</tr>
<tr>
<td>Maintenance Lock:</td>
<td>N</td>
</tr>
<tr>
<td>Inactivity Timeout (min)</td>
<td>20</td>
</tr>
<tr>
<td>QoS Configuration</td>
<td></td>
</tr>
<tr>
<td>Reset System:</td>
<td></td>
</tr>
</tbody>
</table>

- **SVP-II Mode**: Set to **NetLink** if using a NetLink Telephony Gateway.
- **Ethernet Link**: The SVP Server will auto-negotiate unless there is a need to specify a link speed.
- **System Locked**: This option is used to take the system down for maintenance. The default entry is **N** (No). Set it at **Y** (Yes) to prevent any new calls from starting. Return to **N** to restore normal operation.
- **Maintenance Lock**: The system automatically sets this option to **Y** (Yes) after certain maintenance activities that require reset, such as changing the IP address. Maintenance Lock prevents any new calls from starting. Note that the administrator cannot change this option. It is automatically set by the system. Reset the system at exit to clear Maintenance Lock.
- **Inactivity Timeout (min)**: Set the number of minutes the administrative module can be left unattended before the system closes it. This number can be from 1 to 100. If it is set to zero (0), the administrative module will not close due to inactivity.
- **QoS Configuration**: Select this option to set the DSCP tags and the 802.1p tags. See **QoS Configuration** section.
- **Reset System**: If this option is selected, you will be prompted to reset the NetLink SVP Server upon exiting this screen.

The NetLink SVP Server should be reset at the end of any maintenance procedure that requires a reset either via **Maintenance Lock** or manually via **Reset System**.

Note that resetting the NetLink SVP Server will terminate any calls in progress.
IP System Configuration
For an IP system, set the SVP Mode to NetLink IP.

The IP options are shown on the following screen:

```
SVP-II Configuration
Hostname: [SVPU2_1]. Address: 10.8.0.61

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phones per Access Point</td>
<td>7</td>
</tr>
<tr>
<td>802.11 Rate</td>
<td>Automatic</td>
</tr>
<tr>
<td>SVP-II Master</td>
<td>10.8.0.61</td>
</tr>
<tr>
<td>First Alias IP Address</td>
<td>10.17.0.1</td>
</tr>
<tr>
<td>Last Alias IP Address</td>
<td>10.17.0.255</td>
</tr>
<tr>
<td>Enable H.323 Gatekeeper</td>
<td>Y</td>
</tr>
</tbody>
</table>
```

- **Phones per Access Point**: Access point specifications are detailed in the Configuration Notes for each brand and type. Refer to these notes when entering the number of simultaneous calls supported for your type.

- **802.11 Rate**: Select 1MB/2MB to limit the transmission rate between the Wireless Telephones and access points. Select Automatic to allow the Wireless Telephone to determine its rate (up to 11 Mb/s).

- **SVP-II Master**: The master SVP Server must be identified in an IP system. Select one of the following identification options:
  * Statically configure the IP address of the master SVP Server in each of the SVP Servers. Enter the IP address.
  * Statically configure the IP address of the master SVP Server in a DHCP server and configure each of the SVP Servers to get the information from the DHCP server. Enter DHCP. If DHCP is used, the IP address of the master SVP Server must be configured in the DHCP server. See the Wireless Telephone interface document for your IP environment for more information about DHCP integration factors.
  * Statically configure the IP address of the master SVP Server in a DNS server and configure the each of the SVP Servers to retrieve this information from the DNS server. Enter DNS. If DNS is used, the IP address of the master SVP Server must be configured in the DNS server.

- **First Alias IP Address/Last Alias IP Address**: The SVP Server uses an IP address when acting as a proxy for the Wireless Telephone. Therefore, one alias IP address is required for every installed NetLink Wireless Telephone. These IP addresses must be entered as a range and must be assigned solely for this purpose.

  All alias addresses must be on the same subnet as the SVP Server and cannot be duplicated on other subnets or SVP Servers. There is no limit to the number of addresses that can be assigned, but the capacity of each SVP Server is 500 Wireless Telephones.
Alias IP Addresses are not necessary in Avaya and Cisco systems.

- **Enable H.323 Gatekeeper**: In certain H.323 protocol systems, the SVP Server may function as a gatekeeper. Enter Y to have the SVP Server function as the gatekeeper in the H.323 protocol environment.

See the *NetLink Telephony Gateway System Configuration* section for an explanation of the remaining options on this screen.

See the *Overview* section for an explanation of the master SVP Server.

**QoS Configuration**
Tags set packet priorities for QoS.

<table>
<thead>
<tr>
<th>Traffic Class</th>
<th>DSCP Tag</th>
<th>802.1p Tag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>Default</td>
<td>Default</td>
</tr>
<tr>
<td>PT (In call)</td>
<td>Default</td>
<td>Default</td>
</tr>
<tr>
<td>PT (Standby)</td>
<td>Default</td>
<td>Default</td>
</tr>
</tbody>
</table>

Either DSCP or 802.1p tags may be used. DSCP tags may be set to a number 0-255.

- **DSCP Tag** – (Differentiated Services Code Point) is a QoS mechanism for setting relative priorities. Packets are tagged with a DSCP field in the IP header for type of service. The value may be set as a number from 0-255 and may be different for administration and in call/not in call modes.

- **802.11p Tag** – Packets are tagged with a 802.1p field in the Ethernet header for type of service. The value may be set as a number from 0-255 and may be different for administration and in call/not in call modes.
4.5 Change Password

If desired, the password to access the NetLink SVP Server may be changed. Select **Change Password** from the main menu. A screen similar to the following will appear:

```
Old Password ***************
New Password ***************
Confirm New Password ***************
Set Password
Set Password on all SVP servers
```

Enter the information and either select **Set Password** or press the **S** key to set the new password.

Password parameters:
- More than four characters,
- First character must be a letter,
- Other characters may be numbers or letters,
- No dashes, spaces, or punctuation marks, etc. (alphanumeric only).

If you forget a password, call SpectraLink Customer Service for assistance.
5. **Swapping/Adding/Deleting SVP Servers**

Whenever an SVP Server is removed from the system, Wireless Telephones that are using the SVP Server will be affected. If the removal of the SVP Server is intentional, the administrator should lock and idle the system prior to removing an SVP Server. Whenever an SVP Server is added to the system, the change is seamless and does not affect Wireless Telephone calling functionality.

5.1 **IP System**

**Adding an SVP Server**

In the IP PBX environment, a new SVP Server is detected within two seconds of being added to the system (booted/configured/connected). When detected, any Wireless Telephone not active in a call will immediately be forced to check-out and check-in again. Any Wireless Telephone in a call will immediately switch to the SVP Server that should provide its "timing" function. This switch should not be noticeable to the user since it is similar to a normal handoff between access points. When the Wireless Telephone ends the call, it will be forced to checkout and checkin again.

**Removing an SVP Server**

When an SVP Server is removed from the system it is detected within two seconds. Wireless Telephones not in calls are immediately forced to checkout and checkin again. For Wireless Telephones active in calls, two possible scenarios can occur. If the SVP Server that was removed was providing the "gateway" function for the Wireless Telephone, then the call is lost and the Wireless Telephone is forced to checkin again. If the SVP Server that was removed was providing the "timing" function for the call, the call will switch to the SVP Server that should now provide the "timing" function. Note that during the two seconds while the loss of the SVP Server is being detected, the audio for the call will be lost.

**Changing the Master SVP Server**

In the event the master SVP Server loses communication with the network, the Wireless Telephone system will fail. All SVP Servers will lock and all calls will be lost and no calls will be able to be placed. Therefore, if the master SVP Server needs to be replaced, be sure the system can be brought down with minimal call interruption. Be sure to reset all SVP Servers after the master has been replaced. If the IP address of the master is changed, it must be changed in all SVP Servers.
5.2 NetLink Telephony Gateway System

In a NetLink Gateway environment, the addition of an SVP Server is detected as soon as the new SVP Server is running. The new SVP Server will immediately start providing the "timing" function for the appropriate Wireless Telephones. The user should not detect any change. The removal of an SVP Server is detected within one minute. During this time, any Wireless Telephone that was using the SVP Server that was removed will be affected. If the Wireless Telephone was not in a call, the Wireless Telephone may lose contact with its gateway, resulting in a checkout/checkin sequence. If the Wireless Telephone was in a call, the audio will be lost and the call will be dropped.

There is no master SVP Server in a NetLink Telephony Gateway environment.
6. Software Maintenance

The NetLink SVP Server uses proprietary software programs written and maintained by SpectraLink Corporation. The software versions that are running on the system components can be displayed via the System Status screen.

SpectraLink or its authorized dealer will provide information about software updates and how to obtain the software (for example, downloading from a web site).

At startup the NetLink SVP Server uses TFTP to check the software version it is running against the version in the TFTP location. If there is a discrepancy, the NetLink SVP Server will download the version in the TFTP location. See the Setup and Administration document for your vendor’s IP system for more information about using TFTP.

6.1 Software Updates

After software updates are obtained from SpectraLink, they must be transferred to the TFTP location in the LAN to update the code used by the NetLink SVP Server.

Lock the NetLink SVP Server in the SVP-II Configuration screen prior to updating the software.

Note that locking the NetLink SVP Server will prevent new calls from starting. All calls in progress will be terminated when the NetLink SVP Server is reset.
7. Troubleshooting via System Status Menu

Information about system alarms, and network status displays on various screens accessed through the **System Status Menu** screen, opened from the main menu of the NetLink SVP Server. See the previous sections for directions on how to connect to the NetLink SVP Server and navigate to the **System Status Menu**.

```
System Status Menu
Hostname: [SUPU2_J], Address: 10.8.0.61

Error Status
Network Status
Software Versions
Gatekeeper Database

Enter=Select    ESC=Exit    Use Arrow Keys to Move Cursor
```

**Error Status** – displays alarm and error message information.

**Network Status** – displays information about the Ethernet network to which the NetLink SVP Server is connected.

**Software Versions** – lists the software version for each SpectraLink component.

Options on the System Status Menu provide a window into the real time operation of the components of the system. Use this data to determine system function and to troubleshoot areas that may be experiencing trouble.
7.1 Error Status

The Error Status screen displays any alarms that indicate some system malfunction. Some of these alarms are easily remedied and others require a call to SpectraLink’s Customer Support Department.

From the System Status Menu, select Error Status. The screen displays active alarms on the NetLink SVP Server.

The following table displays the list of alarms and a description of the action to take to eliminate the alarm.

<table>
<thead>
<tr>
<th>Alarm Text</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum payload usage reached</td>
<td>Reduce usage, clear alarm</td>
</tr>
<tr>
<td>Maximum telephone usage reached</td>
<td>Reduce usage, clear alarm</td>
</tr>
<tr>
<td>Maximum access point usage reached</td>
<td>Reduce usage, clear alarm</td>
</tr>
<tr>
<td>Maximum call usage reached</td>
<td>Reduce usage, clear alarm</td>
</tr>
<tr>
<td>SRP audio delayed</td>
<td>Reduce usage, clear alarm</td>
</tr>
<tr>
<td>SRP audio lost</td>
<td>Reduce usage, clear alarm</td>
</tr>
<tr>
<td>No IP address</td>
<td>Configure an IP address</td>
</tr>
</tbody>
</table>

Press C to clear all clearable alarms.
7.2 Network Status

The NetLink SVP Server is connected to the Ethernet network, referred to as the LAN or Local Area Network. The information about that connection is provided through the **Network Status** screen.

From the **System Status Menu**, select **Network Status**. The screen displays information about the Ethernet network. This information can help troubleshoot network problems. A sample screen is displayed here.

```
Network Status
Hostname: [SUPU2_1], Address: 10.8.0.61

Ethernet Address: 00:90:70:80:00:77:15
System Uptime: 6 days, 02:34
Net: 100/full
Max calls: 80

RX: bytes packets errors drop fifo alignment multicast
    432891547 4112190 0 0 0 0 1321217

TX: bytes packets errors drop fifo carrier collisions
    1478261799 1311194 0 0 0 0 0

SUP-II Sockets in Use (Last / Max): 0 / 10
SUP-II Access Points in Calls (Last / Max): 0 / 2
SUP-II Telephones in Use (Last / Max): 0 / 1
SUP-II Telephones in Calls (Last / Max): 0 / 2
SUP-II SRP Audio (Delay / Lost): 0 / 0

ESC to Exit
```

**Ethernet Address** – MAC address of the NetLink SVP Server (hexadecimal).

**System Uptime** – the number of days, hours and minutes since the NetLink SVP Server was last reset.

**Net** – the type of connection to the Ethernet switch currently utilized. See SVP100 Capacity for more information.

Data is transmitted over SpectraLink components by proprietary technology developed by SpectraLink Corporation. The SpectraLink Radio Protocol (SRP) packets and bytes can be differentiated from other types of transmissions and are used to evaluate system functioning by SpectraLink customer support and engineering personnel.
RX – Ethernet statistics concerning the received packets during System Uptime.
- **bytes** – bytes received
- **packets** – packets received
- **errors** – sum of all receive errors (long packet, short packet, CRC, overrun, alignment)
- **drop** – packets dropped due to insufficient memory
- **fifo** – overrun occurred during reception
- **alignment** – nonoctet-aligned packets (number of bits NOT divisible by eight)
- **multicast** – packets received with a broadcast or multicast destination address

TX – Ethernet statistics concerning the transmitted packets during System Uptime.
- **bytes** – bytes transmitted
- **packets** – packets transmitted
- **errors** – sum of all transmit errors (heartbeat, late collision, repeated collision, underrun, carrier)
- **drop** – packets dropped due to insufficient memory
- **fifo** – underrun occurred during transmission
- **carrier** – carrier lost during transmission
- **collisions** – packets deferred (delayed) due to collision

**SVP-II Access Points in Use** – access points in use by Wireless Telephones, either in standby or in a call. ‘Last’ is current, ‘Max’ is the maximum number in use at one time.

**SVP-II Access Points in Calls** – access points with Wireless Telephones in a call

**SVP-II Telephones in Use** – Wireless Telephones in standby or in a call

**SVP-II Telephones in Calls** – Wireless Telephones in a call

**SVP-II SRP Audio (Delay)** – SRP audio packets whose transmission was momentarily delayed

**SVP-II SRP Audio (Lost)** – SRP audio packets dropped due to insufficient memory resources
7.3 Software Version

The NetLink SVP Server and Wireless Telephones utilize SpectraLink Corporation’s proprietary software that is controlled and maintained through versioning. The Software Version screen provides information about the version currently running on the NetLink SVP Server. This information will help you determine if you are running the most recent version and will assist SpectraLink engineering and/or customer support in troubleshooting software problems.

From the System Status Menu, select **Software Version**. A sample screen is displayed here.

```
Software Version Numbers
Hostname: [SUP02_1], Address: 10.8.0.61

Hardware Versions:    32/02 EMG
Factory Page:          230.008
Downloader:            230.157 (Sea5a4cc)
Table of Contents:     173.001 (00b366ac)
Functional Code:       174.001 (cW942c06)
File System:           175.001 (c7e2b400)

ESC to Exit
```

Note that the software versions on your system will be different from the versions displayed in the above sample screen which shows the 170 series software.
7.4 Gatekeeper Database

The Gatekeeper Database screen lists the registered extension numbers and the IP address currently being used by each.

<table>
<thead>
<tr>
<th>Alias/Phone Number</th>
<th>RAS IP address</th>
<th>CSA IP address</th>
<th>Expiration (secs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1501</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1502</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1503</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1510</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1511</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1520</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1597</td>
<td>10.17.130.2</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1599</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>1700</td>
<td>10.12.0.12</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>2009</td>
<td>10.17.130.1</td>
<td>10.12.0.12</td>
<td>31</td>
</tr>
<tr>
<td>GW_0_0 10.12.0.12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alias/Phone Number – phone identifier.

RAS IP address – (Registration Admission Status) IP address.

CSA IP address – (Call Signaling Address) IP address.

Expiration (secs) – the number of seconds until the record will be renewed. A Wireless Telephone IP address is renewed every 90 seconds.

Press the question mark (shift + ?) to open the H.323 Gatekeeper Database Help screen: The help screen provides information about how to scroll and search the database.
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