Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Avaya VPNremote™ Phone with Juniper Secure Services Gateway using Policy-Based IPSec VPN and XAuth Enhanced Authentication – Issue 1.0

Abstract

These Application Notes describe the steps for configuring the Juniper Secure Services Gateway 520 Security Platform with a policy-based IPSec VPN and XAuth enhanced authentication to support the Avaya VPNremote™ Phone. The sample configuration presented in these Application Notes utilizes a shared IKE Group ID to streamline the VPN configuration and management, IP Network Region segmentation to logically group and administer VPNremote Phones and NAT-T for IPSec traversal of Network Address Translation devices.

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1. Introduction

These Application Notes describes the steps for configuring the Juniper Secure Services Gateway 520 security appliance to support the Avaya VPNremote™ Phone.

The Avaya VPNremote™ Phone is a software based Virtual Private Network (VPN) client integrated into the firmware of an Avaya IP Telephone. This enhancement allows the Avaya IP Telephone to be plugged in and used seamlessly over a secure VPN from any broadband Internet connection. The end user experiences the same IP telephone features as if they were using the phone in the office. Avaya IP Telephone models supporting the Avaya VPNremote Phone firmware are the 4610SW, 4620SW, 4621SW, 4622SW and 4625SW.

Release 2 of the Avaya VPNremote Phone extends the support of head-end VPN gateways to include Juniper security platforms. The configuration steps described in these Application Notes utilize a Juniper Secure Services Gateway (SSG) model 520. However, these configuration steps can be applied to Juniper NetScreen and ISG platforms using the ScreenOS version specified in **Section 3**.

1.1. Highlights

The sample network provided in these Application Notes implements the following features of the Juniper SSG 520 and Avaya VPNremote Phone:

- **Policy-Based IPSec VPN**
  The policy-based VPN feature of the Juniper SSG allows a VPN Tunnel to be directly associated with a security policy as opposed to a route-based VPN being bound to a logical VPN Tunnel interface. Because no network exists beyond a VPN client end-point, policy-based VPN tunnels are a good choice for VPN end-point configurations such as with the Avaya VPNremote Phone.

- **XAuth User Authentication**
  The XAuth protocol enables the Juniper SSG to authenticate the individual users of the VPNremote Phone. The XAuth user authentication is in addition to the IKE IPSec VPN authentication. The IKE and XAuth authentication steps of the Avaya VPNremote Phone are as follows:

Step 1. **Phase 1 negotiations:** the Juniper SSG authenticates the Avaya VPNremote Phone by matching the IKE ID and Pre-SharedKkey sent by the Avaya VPNremote Phone. If there is a match, the Juniper SSG XAuth process begins.

Step 2. **XAuth:** the Juniper SSG XAuth server prompts the Avaya VPNremote Phone for user credentials (username and password). If the Avaya VPNremote Phone is configured to store user credentials in flash memory, the Avaya VPNremote Phone responds to the Juniper SSG with the stored credentials without user involvement. Otherwise the Avaya VPNremote Phone displays a prompt for username and password to be manually entered.

Step 3. **Phase 2 negotiations:** Once the XAuth user authentication is successful, Phase 2 negotiations begin.

- **XAuth Dynamic IP Address Assignment**
  The XAuth protocol enables the Juniper SSG appliance to dynamically assign IP addresses from a configured IP Address pool range. The assignment of IP address ranges to Avaya VPNremote Phones enables Avaya Communication Manager to map the Avaya VPNremote Phones into IP Network Regions.

- **Shared IKE Group ID**
  The shared IKE ID feature of the Juniper SSG appliance facilitates the deployment of a large number of dialup IPSec VPN users. With this feature, the security device authenticates multiple dialup VPN users using a single group IKE ID and preshared key. Thus, it provides IPSec protection for large remote user groups through a common VPN configuration. XAuth user authentication must be used when implementing Shared IKE Group ID.

- **IP-Network-Region Segmentation**
  A common deployment for the Avaya VPNremote Phones is in a home network environment with limited bandwidth. The G.729 codec is recommended for such bandwidth constrained environments. Avaya Communication Manager IP Network Regions allow IP endpoints to be logically grouped together to apply unique configuration settings, including the assignment of specific codecs.

2. Network Topology

The sample network implemented for these Application Notes is shown in **Figure 1.** Three office locations are included, a “Main Campus” and three “Remote Offices”.

The **Main Campus** consists of two Juniper SSG 520’s, named “SSG 520 A” and “SSG 520 B”, functioning as perimeter security devices and IPSec VPN head-ends. The Avaya S8710 Media Server and Avaya G650 Media Gateway are also located at the Main Campus. The Main Campus is mapped to **Network Region 1** in Avaya Communication Manager.

Remote SOHO Office A consists of two Avaya VPNremote Phones connected to a Netgear broadband router. The Netgear router is configured as a firewall with NAT enabled as well as a local DHCP server. The VPNremote phones in Remote Office A are configured to use **SSG 520 A** for IPSec tunnel termination. SSG 520 A assigns an IP address to the VPNremote Phones mapped to **Network Region 2** in Avaya Communications Manager.

Remote Home Office B consists of a single Avaya VPNremote Phones connected to a Linksys broadband router. The Linksys router is configured as a firewall with NAT enabled as well as a local DHCP server. The VPNremote phone in Remote Office B is configured to use **SSG 520 A** for IPSec tunnel termination. SSG 520 A assigns an IP address to the VPNremote Phone mapped to **Network Region 2** in Avaya Communication Manager.

Remote Home Office C consists of a single Avaya VPNremote Phones connected to a Dlink broadband router. The Dlink router is configured as a firewall with NAT enabled as well as a local DHCP server. The VPNremote phone in Remote Office C is configured to use **SSG 520 B** for IPSec tunnel termination. SSG 520 B assigns an IP address to the VPNremote Phone mapped to **Network Region 3** in Avaya Communication Manager.

Table 1 summarizes the Network Region IP address mappings.

Network Region	IP Address Range	Juniper SSG	Office
[redacted]	[redacted]	[redacted]	[redacted]
1	192.168.1.0 /24	-	Main
2	50.50.100.0 /24	A	Remote SOHO Office A Remote Home Office B
3	50.50.130.0 /24	B	Remote Home Office C

Table 1 – Network Region Mappings

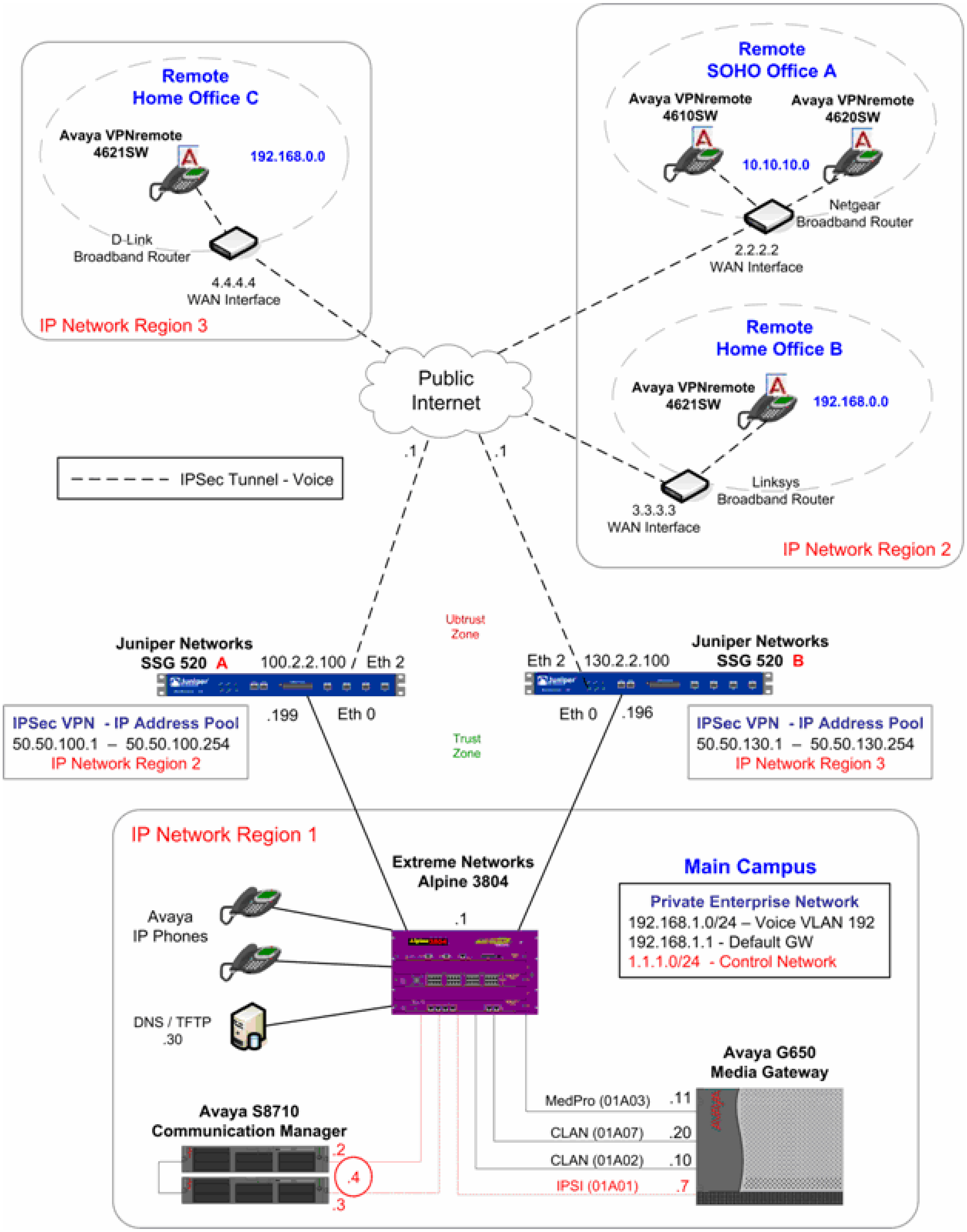


Figure 1: Physical Network

3. Equipment and Software Validated

Table 2 lists the equipment and software/firmware versions used in the sample configuration provided.

Device Description	Versions Tested
Avaya S8710 Media Server	Avaya Communication Manager R3.0.1 (R013x.00.1.346.0)
Avaya G650 Media Gateway	-
TN2312BP IPSI	FW 22 (HV 6)
TN799DP C-LAN	FW 16 (HV 1)
TN2302AP IP MedPro	FW 108 (HV 12)
Avaya 4610SW IP Telephones	R2.3.2 – **Release 2** (a10b**VPN232**_1.bin)
Avaya 4620SW IP Telephones	R2.3.2 – **Release 2** (a20b**VPN232**_1.bin)
Avaya 4621SW IP Telephones	R2.3.2 – **Release 2** (a20b**VPN232**_1.bin)
Avaya 4625SW IP Telephones	R2.5.2 – Application (a25**VPN252**_1.bin)
Juniper Networks SSG 520	ScreenOS 5.4.0r1.0
Extreme Alpine 3804	
Netgear Broadband Router – RP614v3	Firmware – V6.0NA 09/03/04
D-Link Broadband Router – DL-604	Firmware – 3.51 11/22/04
Linksys Broadband Router – BEFSR41 Ver4	Firmware – v1.04.05 07/20/05

Table 2 – Equipment and Software Validated

4. Configure Juniper SSG 520

Two Juniper SSG 520's are included in the sample configuration as described in **Section 2**. The primary difference in the configuration between these Juniper SSG 520s is IP address assignment and IP Pool address range. For brevity purposes, only the steps for configuring one of the SSG's, **SSG 520 A**, is covered in these Application Notes.

The configuration steps utilize the Web User Interface (WebUI) of the Juniper SSG 520. The entire Juniper SSG 520 system CLI configuration is provided as a reference in **Appendix A**.

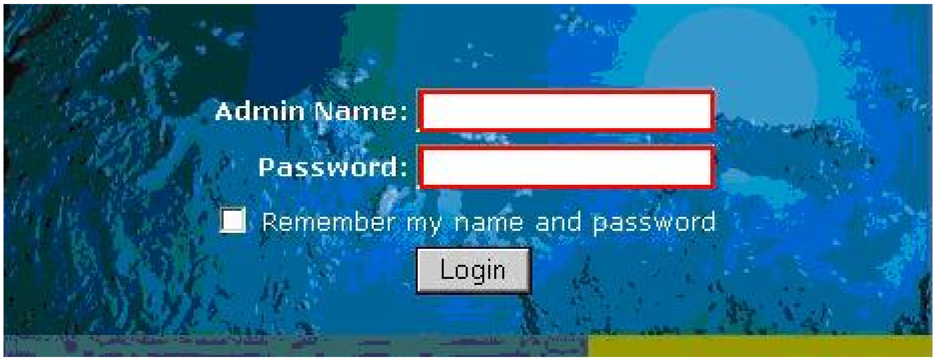
4.1. Access SSG 520

1. From a serial connection to the Console port of the Juniper SSG, log in and access the Command Line Interface using a Terminal Emulation application such as Windows HyperTerm. Execute the following commands to configure the Juniper SSG Ethernet interface 0/0. This enables access to the Juniper SSG WebUI.

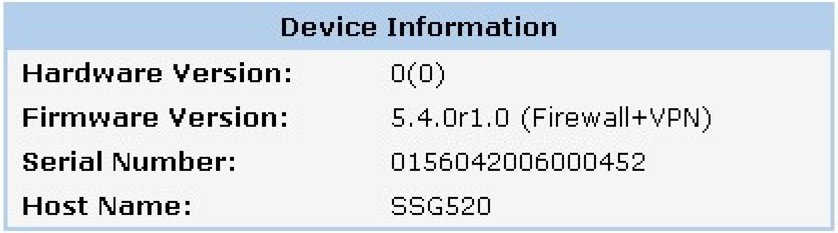
```
SSG520-> set interface ethernet0/0 ip 192.168.1.199/24

SSG520-> set interface ethernet0/0 ip manageable
```

2. From a web browser, enter the URL of the Juniper SSG WebUI management interface, https://<IP address of the SSG>, and the following login screen appears. Log in using a user name with administrative privileges.



3. The Juniper SSG WebUI administration home page appears upon successful login. Note the ScreenOS Firmware Version in the Device Information section.



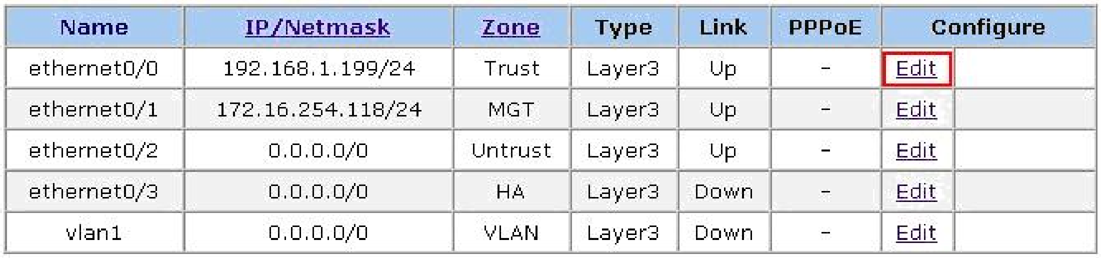
Device Information	
Hardware Version:	0(0)
Firmware Version:	5.4.0r1.0 (Firewall+VPN)
Serial Number:	0156042006000452
Host Name:	SSG520

4.2. Configure Juniper SSG Ethernet Interfaces

The Juniper SSG 520 has four build-in Ethernet interfaces, Ethernet 0/0 – Ethernet 0/3. The steps below configured Ethernet 0/0 to a Trust security zone facing the internal corporate network and Ethernet 0/2 to an Untrust security zone facing the public internet. The Avaya VPNremote Phone will interact with Ethernet 0/2 when establishing an IPSec Tunnel.

Configure Ethernet 0/0:

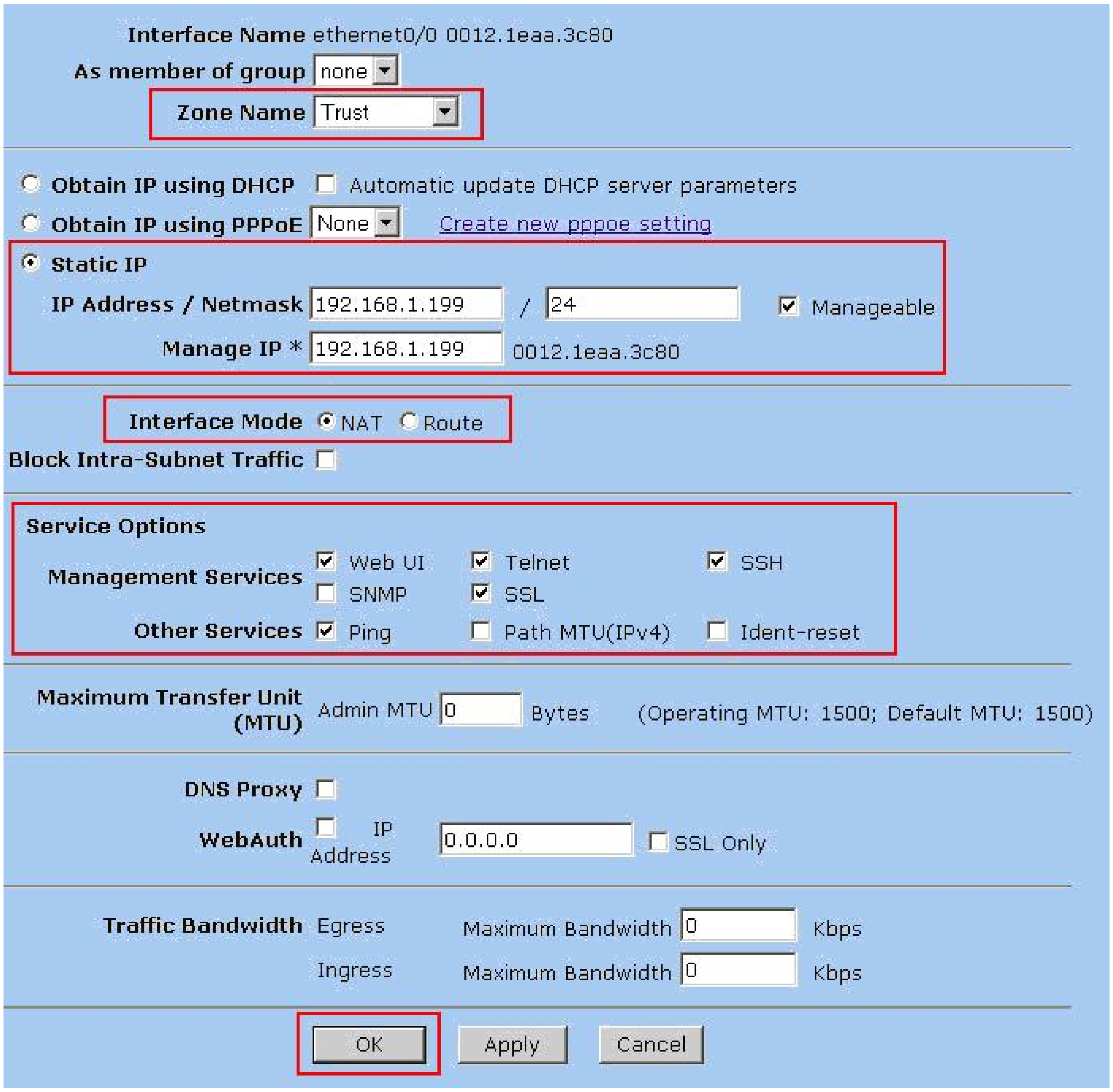
1. From the left navigation menu, select **Network > Interfaces**.
The **Network Interfaces List** screen appears. The IP address is already populated for Ethernet0/0 from the basic configuration of **Section 4.1.** Select **Edit** for Ethernet 0/0 to configure additional parameters.



Name	IP/Netmask	Zone	Type	Link	PPPoE	Configure
ethernet0/0	192.168.1.199/24	Trust	Layer3	Up	-	Edit
ethernet0/1	172.16.254.118/24	MGT	Layer3	Up	-	Edit
ethernet0/2	0.0.0.0/0	Untrust	Layer3	Up	-	Edit
ethernet0/3	0.0.0.0/0	HA	Layer3	Down	-	Edit
vlan1	0.0.0.0/0	VLAN	Layer3	Down	-	Edit

2. From the Ethernet 0/0 properties page, configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** to save.

Ethernet 0/0 connects to the private corporate network making it a trusted interface. It is placed in the **Trust** security zone of the Juniper SSG. The **Service Options** selected and enabling **Manageability** are related to the interface being in the Trust zone.



Interface Name ethernet0/0 0012.1eaa.3c80

As member of group none

Zone Name Trust

○ **Obtain IP using DHCP** □ Automatic update DHCP server parameters

○ **Obtain IP using PPPoE** None Create new pppoe setting

● **Static IP**

IP Address / Netmask 192.168.1.199 / 24 ☑ Manageable

Manage IP * 192.168.1.199 0012.1eaa.3c80

Interface Mode ● NAT ○ Route

Block Intra-Subnet Traffic □

Service Options

Management Services ☑ Web UI ☑ Telnet ☑ SSH □ SNMP ☑ SSL

Other Services ☑ Ping □ Path MTU(IPv4) □ Ident-reset

Maximum Transfer Unit (MTU) Admin MTU 0 Bytes (Operating MTU: 1500; Default MTU: 1500)

DNS Proxy □

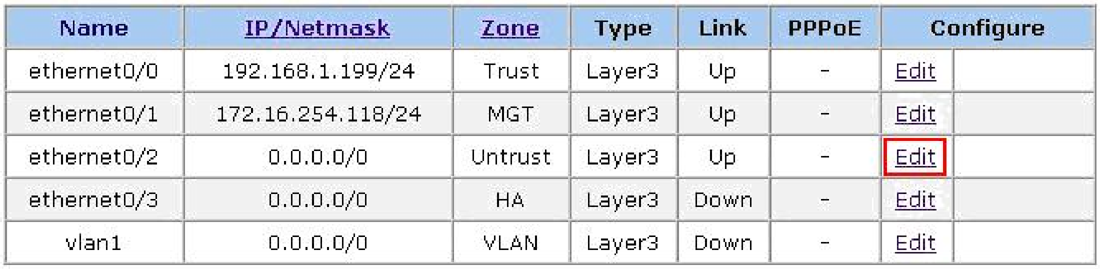
WebAuth □ IP Address 0.0.0.0 □ SSL Only

Traffic Bandwidth Egress Maximum Bandwidth 0 Kbps

Ingress Maximum Bandwidth 0 Kbps

Configure Ethernet 0/2 Interface:

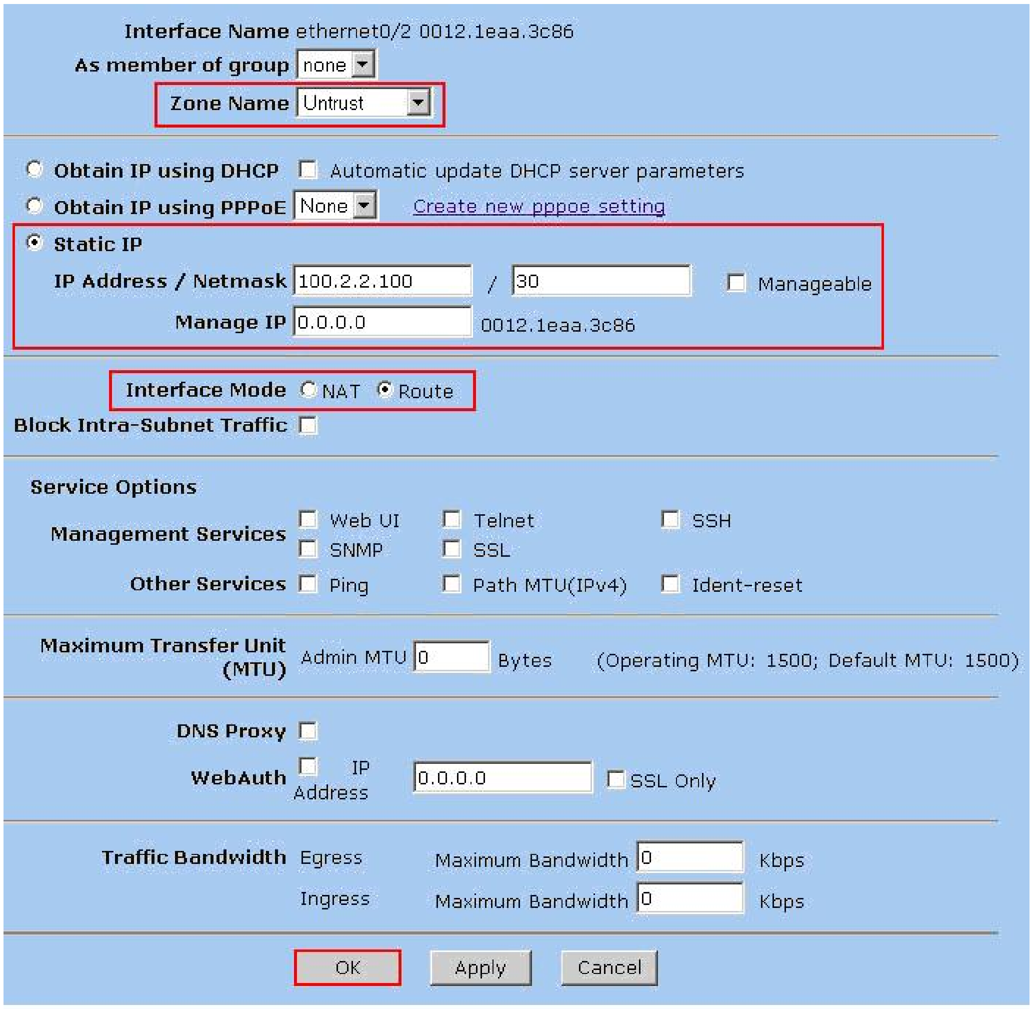
1. From the **Network Interfaces List** screen, select **Edit** for Ethernet 0/2



Name	IP/Netmask	Zone	Type	Link	PPPoE	Configure
ethernet0/0	192.168.1.199/24	Trust	Layer3	Up	-	Edit
ethernet0/1	172.16.254.118/24	MGT	Layer3	Up	-	Edit
ethernet0/2	0.0.0.0/0	Untrust	Layer3	Up	-	Edit
ethernet0/3	0.0.0.0/0	HA	Layer3	Down	-	Edit
vlan1	0.0.0.0/0	VLAN	Layer3	Down	-	Edit

2. From the Ethernet 0/2 properties page, configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** to save.

   Because Ethernet0/2 is in the Untrust zone and not configured as manageable, all service options are disabled.



Interface Name ethernet0/2 0012.1eaa.3c86

As member of group none

Zone Name Untrust

○ Obtain IP using DHCP □ Automatic update DHCP server parameters

○ Obtain IP using PPPoE None Create new pppoe setting

● Static IP

IP Address / Netmask 100.2.2.100 / 30 □ Manageable

Manage IP 0.0.0.0 0012.1eaa.3c86

Interface Mode ○ NAT ● Route

Block Intra-Subnet Traffic □

Service Options

Management Services □ Web UI □ Telnet □ SSH □ SNMP □ SSL

Other Services □ Ping □ Path MTU(IPv4) □ Ident-reset

Maximum Transfer Unit (MTU) Admin MTU 0 Bytes (Operating MTU: 1500; Default MTU: 1500)

DNS Proxy □

WebAuth □ IP Address 0.0.0.0 □ SSL Only

Traffic Bandwidth Egress Maximum Bandwidth 0 Kbps

Ingress Maximum Bandwidth 0 Kbps

4.3. IP Address Pool

The XAuth protocol enables the Juniper SSG to dynamically assign IP addresses from a configured IP Address pool range to IPSec clients such as the Avaya VPNremote Phone. Controlling the assignment of IP address ranges to Avaya VPNremote Phones enables Avaya Communication Manager to map the Avaya VPNremote Phones into IP Network Regions as described in **Section 7.4**.

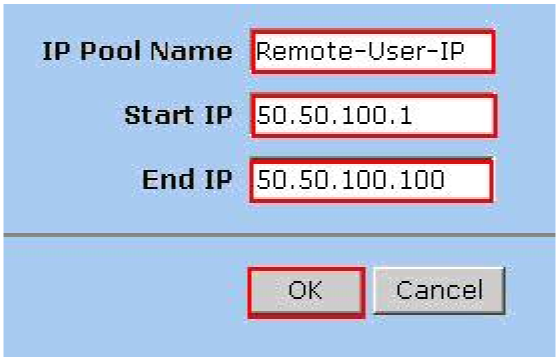
The following steps create the IP Address Pool:

1. From the left navigation menu, select **Objects > IP Pools**.
   On the IP Pools list page, select **New.**

2. From the IP Pools Edit page, populate the highlighted fields shown below then select **OK** to save.

   The **IP Pool Name** is a descriptive name for this IP Pool. Once configured, this name will appear in the **IP Pool Name** drop-down menu of **Section 4.8.**

   Ensure the IP address range does not conflict with addresses used throughout the corporate trusted network.

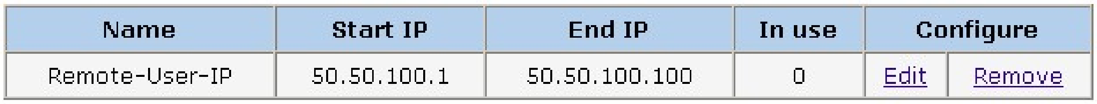


IP Pool Name: Remote-User-IP

Start IP: 50.50.100.1

End IP: 50.50.100.100

3. The IP Pools list page displays the new address pool entry.



Name	Start IP	End IP	In use	Configure	
Remote-User-IP	50.50.100.1	50.50.100.100	0	Edit	Remove

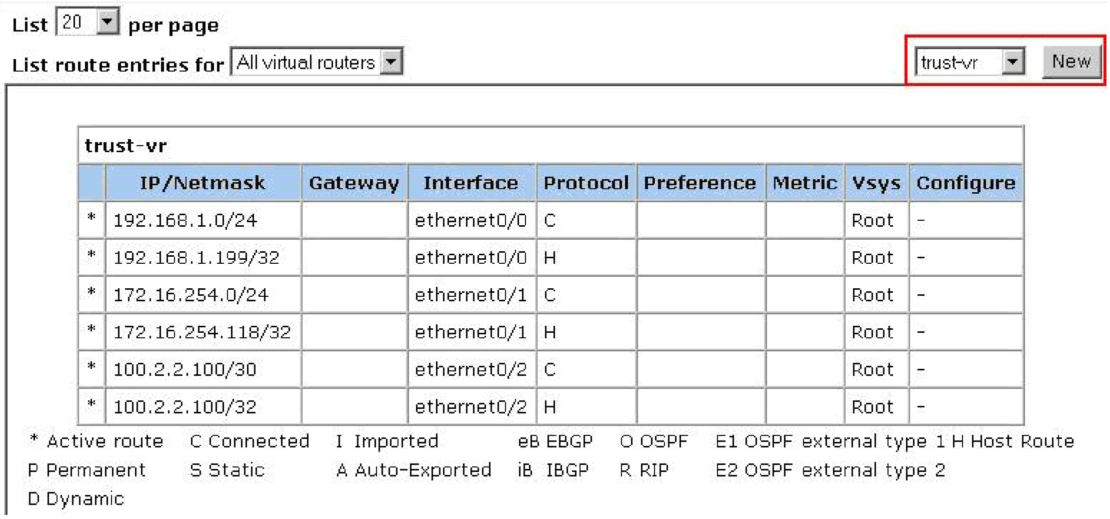
4.4. Routes

The sample configuration requires two new route entries be added to the Juniper SSG routing table, one specifying the default route and one specifying the network address range entered for the IP Address Pool in **Section 4.3.** Although several routing options exist in the Juniper SSG platform, static routes are used for this sample configuration.

4.4.1. Configure Default Route

1. From the left navigation menu, select **Network > Routing > Destination**
The Route Entries screen similar to the one below appears.

Select **trust-vr** from drop down menu then **New**



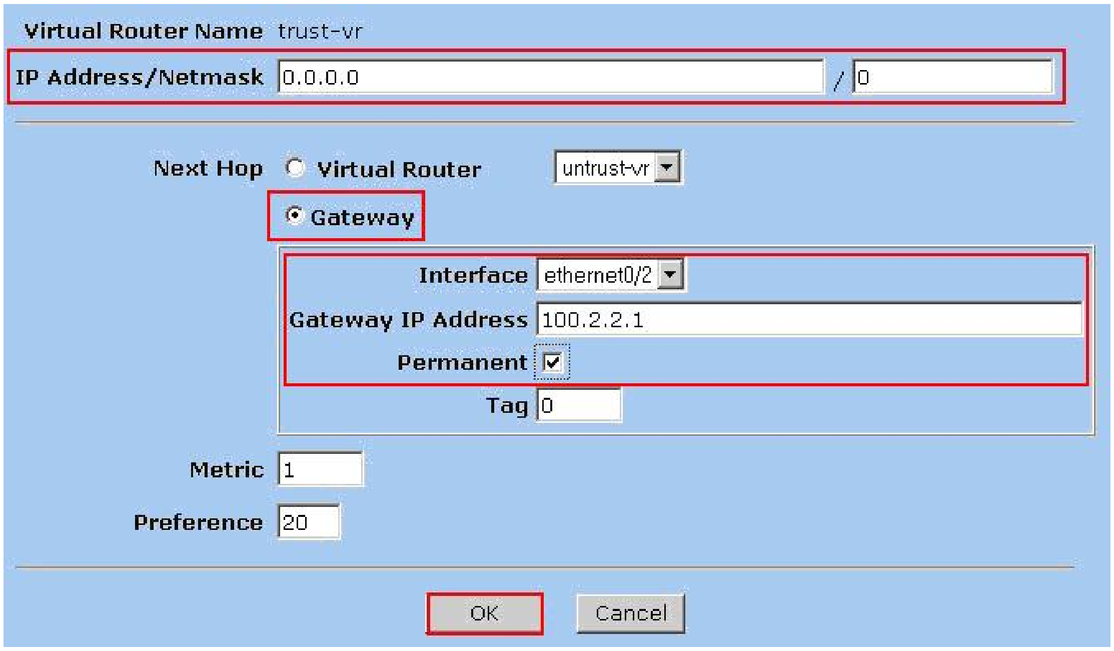
trust-vr

	IP/Netmask	Gateway	Interface	Protocol	Preference	Metric	Vsys	Configure
*	192.168.1.0/24		ethernet0/0	C			Root	-
*	192.168.1.199/32		ethernet0/0	H			Root	-
*	172.16.254.0/24		ethernet0/1	C			Root	-
*	172.16.254.118/32		ethernet0/1	H			Root	-
*	100.2.2.100/30		ethernet0/2	C			Root	-
*	100.2.2.100/32		ethernet0/2	H			Root	-

* Active route	C Connected	I Imported	eB EBGP	O OSPF	E1 OSPF external type 1 H Host Route
P Permanent	S Static	A Auto-Exported	iB IBGP	R RIP	E2 OSPF external type 2
D Dynamic					

2. Configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** to save.

   The 0.0.0.0/0 network indicates the default route when no other matches existing in the routing table. The route is going to the next hop out interface Ethernet 0/2 to the public internet.



Virtual Router Name trust-vr

IP Address/Netmask 0.0.0.0 / 0

Next Hop ○ Virtual Router untrust-vr

● Gateway

Interface ethernet0/2

Gateway IP Address 100.2.2.1

Permanent ☑

Tag 0

Metric 1

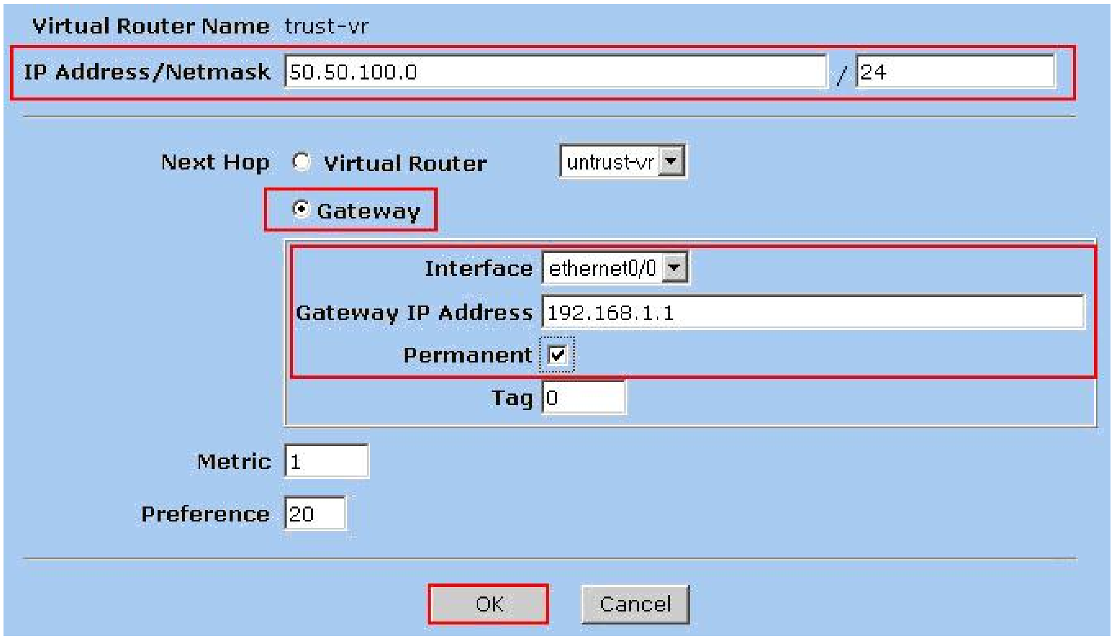
Preference 20

4.4.2. Configure Route to IP Pool Address range

1. From the Route Entries screen, select **trust-vr** from the drop down menu then select **New.**

2. Configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** to save.

   The **IP Address / Netmask** is the network used for the IP Address Pool in **Section 4.3.** The **Gateway IP Address** specifies the next hop route of the Trusted corporate network, the Extreme 3804 L2/L3 switch in the sample configuration. See **Section 6** for information on the Extreme 3804 switch.



Virtual Router Name trust-vr

IP Address/Netmask 50.50.100.0 / 24

Next Hop ○ Virtual Router untrust-vr

● Gateway

Interface ethernet0/0

Gateway IP Address 192.168.1.1

Permanent ☑

Tag 0

Metric 1

Preference 20

4.5. Local User Configuration

The sample configuration includes two different user types; IKE users and XAuth users.

IKE users are typically associated with a device such as the Avaya VPNremote Phone and are used to authenticate the actual device during the establishment of the IPSec tunnel.

XAuth users are remotely authenticated users who access a head-end security gateway via an AutoKey IKE VPN tunnel. Whereas the authentication of IKE users is actually the authentication of an individual's device, Avaya VPNremote Phone, the authentication of XAuth users is the authentication of the individual themselves.

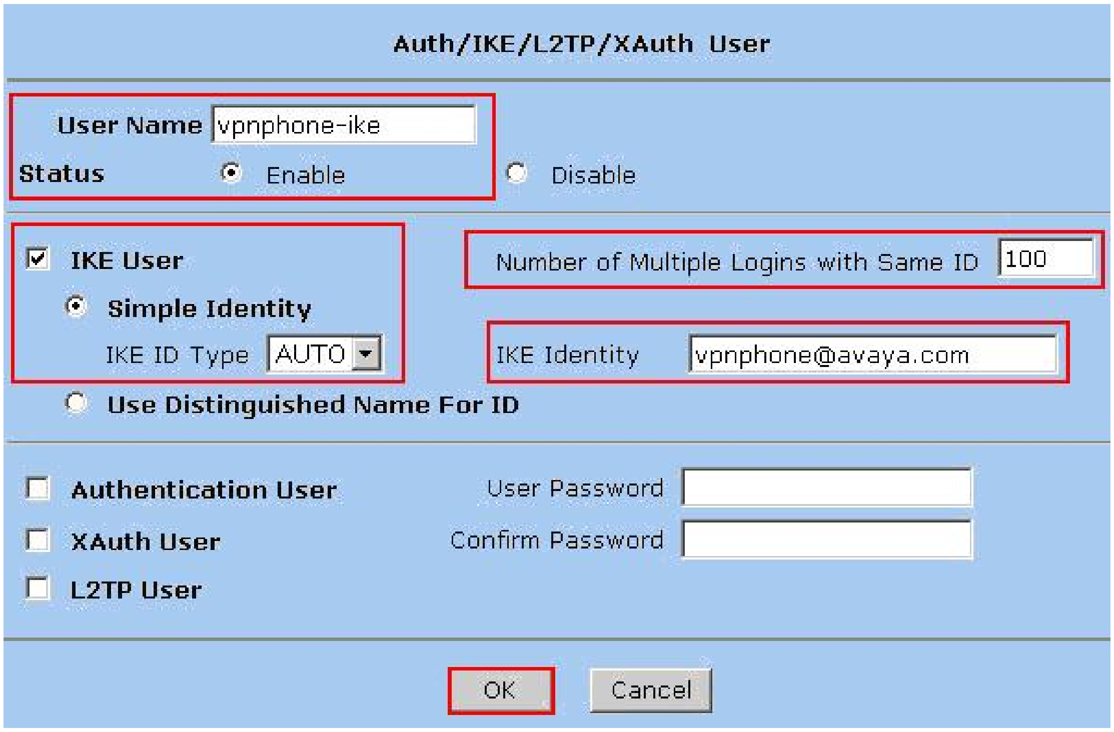
4.5.1. IKE User

The following steps create an IKE user to be used by Avaya VPNremote Phones for IKE authentication.

1. From the left navigation menu, select **Objects > User > Local > New**. Configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** to save.

The **Number of Multiple Logins with Same ID** parameter specifies the number of end-points that can concurrently establish IPSec tunnels using this identity. This number must equal or exceed the number of Avaya VPNremote Phones accessing this Juniper SSG.

IKE Identity, combined with a Pre-Shared Key**,** is used to identify the end-point when an initial IKE Phase one dialog begins. The format of the IKE Identity used is of an email address. As described in **Section 5.2**, the Group Name field of the Avaya VPNremote Phone must match this IKE Identity string. vpnphone@avaya.com is used in these Application Notes however any email address string can be used.



Auth/IKE/L2TP/XAuth User

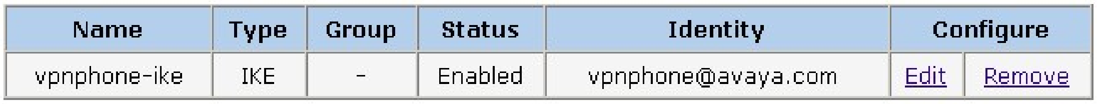
User Name: vpnphone-ike
Status: ● Enable ○ Disable

☑ IKE User
● Simple Identity
IKE ID Type: AUTO
○ Use Distinguished Name For ID

Number of Multiple Logins with Same ID: 100
IKE Identity: vpnphone@avaya.com

□ Authentication User
□ XAuth User
□ L2TP User
User Password:
Confirm Password:

2. The local Users list page displays the new IKE user:



Name	Type	Group	Status	Identity	Configure	
vpnphone-ike	IKE	-	Enabled	vpnphone@avaya.com	Edit	Remove

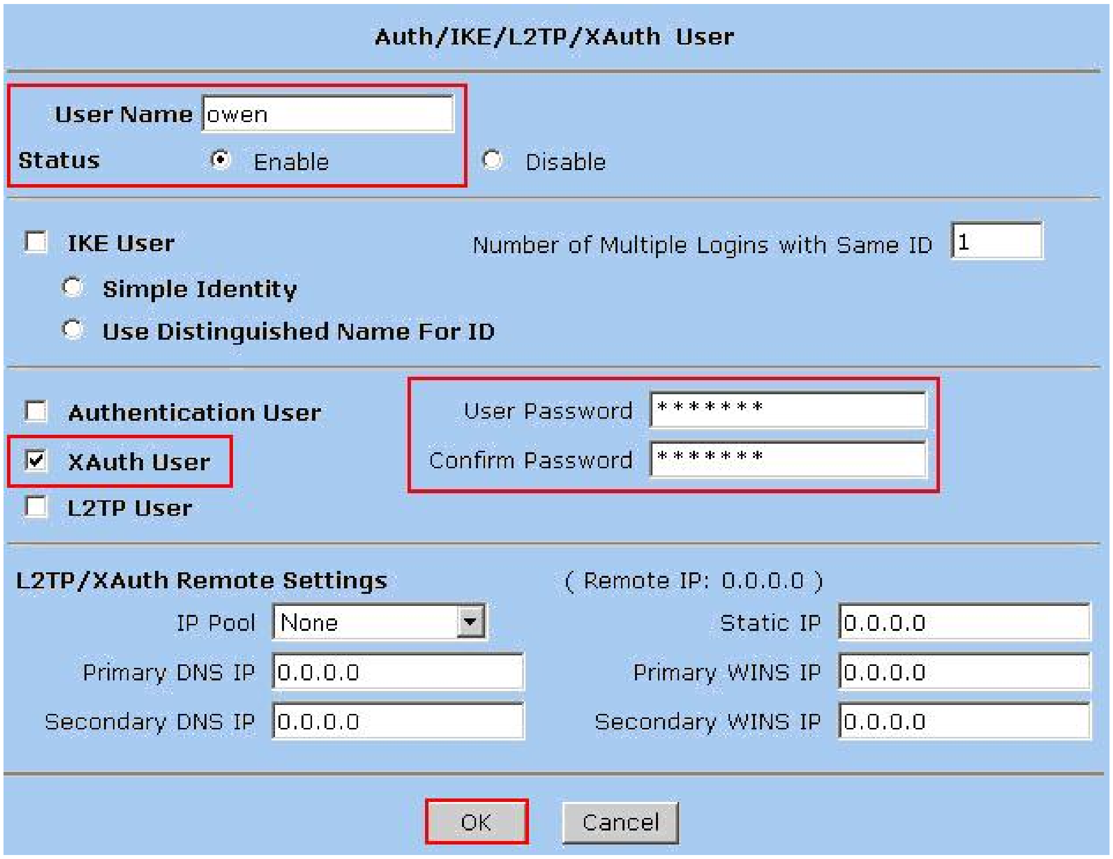
4.5.2. XAuth Users

Three XAuth user accounts, **owen**, **garrett**, and **evan** are created in the sample configuration for users of the Avaya VPNremote Phones. The following steps create a user account for **owen**. Follow the same steps to create accounts for **garrett** and **evan**.

The XAuth server of the Juniper SSG provides the authentication of these users. The users of the Avaya VPNremote Phone will need to be supplied with their user name and password. Users will be prompted on the phone display to enter this information as the Avaya VPNremote Phone establishes the IPSec tunnel or the password can be stored the VPNremote Phones flash memory, see **Section 5.2** for additional detail.

1. From the left navigation menu, select **Objects** > **User** > **Local** > **New**. Configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** to save.

Follow the same steps for each additional user.



Auth/IKE/L2TP/XAuth User

User Name owen

Status ● Enable ○ Disable

□ IKE User

Number of Multiple Logins with Same ID 1

○ Simple Identity

○ Use Distinguished Name For ID

□ Authentication User

☑ XAuth User

□ L2TP User

User Password *******

Confirm Password *******

L2TP/XAuth Remote Settings (Remote IP: 0.0.0.0)

IP Pool None

Static IP 0.0.0.0

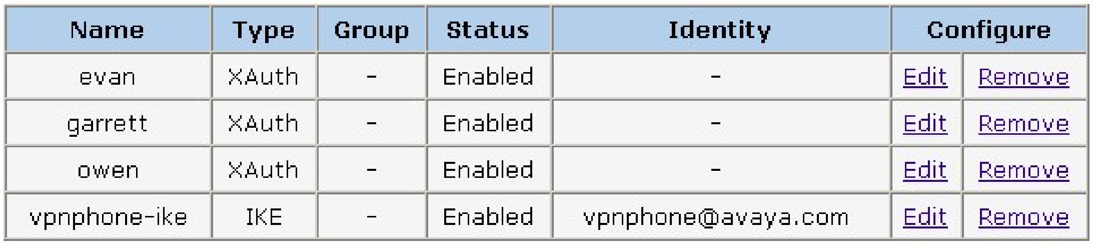
Primary DNS IP 0.0.0.0

Primary WINS IP 0.0.0.0

Secondary DNS IP 0.0.0.0

Secondary WINS IP 0.0.0.0

2. The local Users list page displays the new XAuth users:



Name	Type	Group	Status	Identity	Configure	
evan	XAuth	-	Enabled	-	Edit	Remove
garrett	XAuth	-	Enabled	-	Edit	Remove
owen	XAuth	-	Enabled	-	Edit	Remove
vpnphone-ike	IKE	-	Enabled	vpnphone@avaya.com	Edit	Remove

4.6. Local User Group Configuration

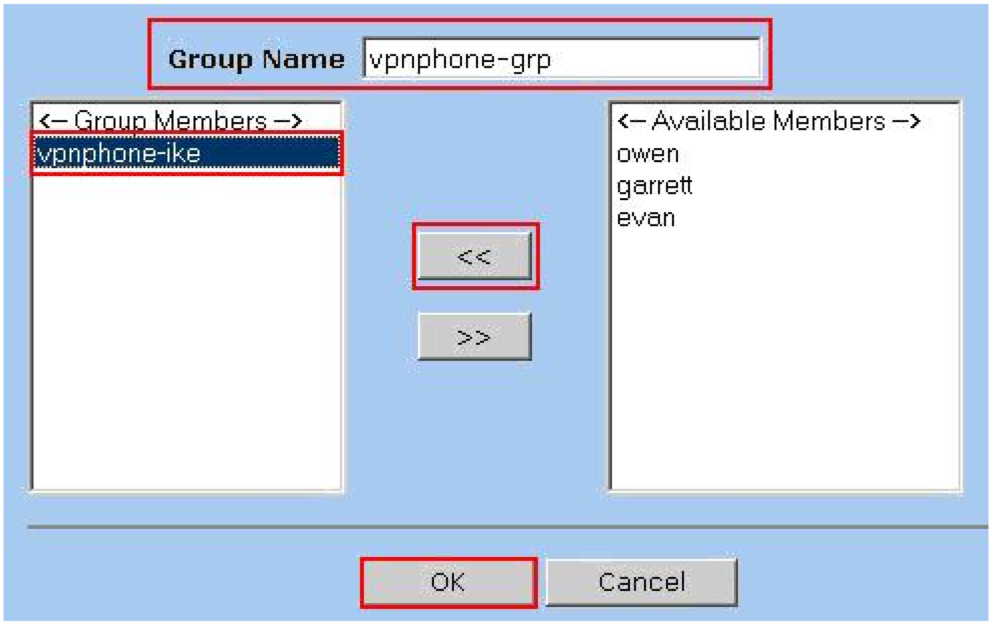
User groups have the benefit of being able to create one policy for the user group and that policy automatically applies to all members of a group. This eliminates the need to create polices for each individual user.

The sample configuration includes two different types of User Groups: IKE and XAuth. The IKE users and XAuth users created in **Section 4.5** must now be added to an IKE Group and an XAuth Group respectfully.

4.6.1. IKE User Group

1. From the left navigation menu, select **Objects > User > Local Groups > New**.

Enter a descriptive **Group Name**. Select the vpnphone-ike user name from the **Available Members** column on the right. Select the << icon to move the user name to the **Group Members** column on the left. Select **OK** to save.

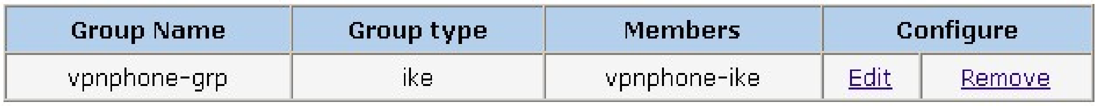


Group Name: vpnphone-grp

<- Group Members ->
vpnphone-ike

<- Available Members ->
owen
garrett
evan

2. The Local Groups list page displays the new IKE group:

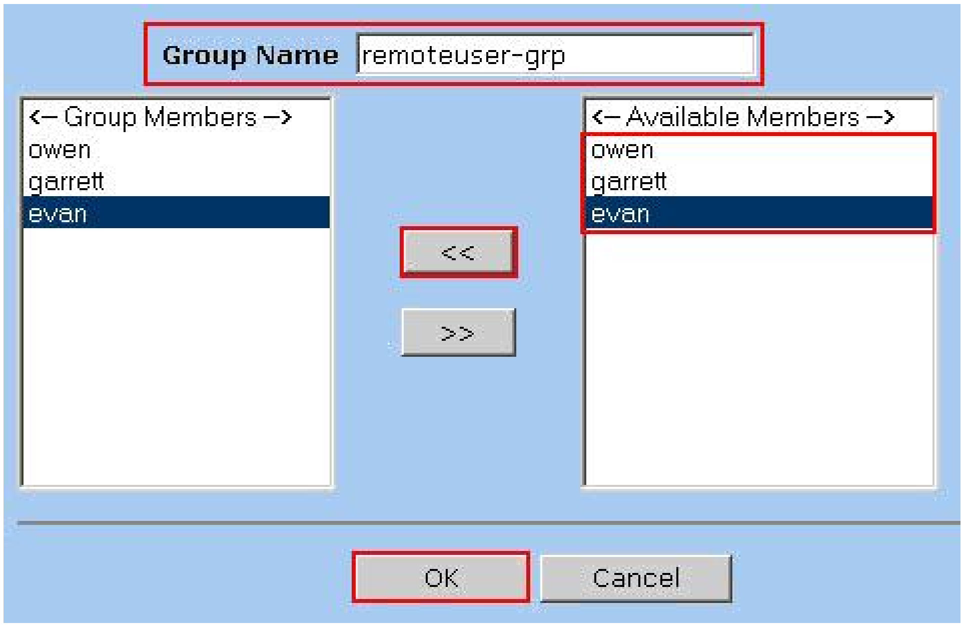


Group Name	Group type	Members	Configure	
vpnphone-grp	ike	vpnphone-ike	Edit	Remove

4.6.2. Xauth User Group

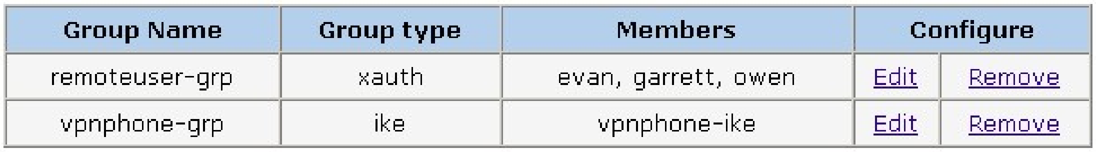
1. From the left navigation menu, select **Objects > User > Local Groups > New**.

Enter a descriptive **Group Name**. Select the owen, garrett and evan user names from the **Available Members** column on the right. Select the **<<** icon to move the user name to the **Group Members** column on the left. Select **OK** to save.



Group Name: remoteuser-grp

2. The Local Groups list page displays the new XAuth group:



Group Name	Group type	Members	Configure	
remoteuser-grp	xauth	evan, garrett, owen	Edit	Remove
vpnphone-grp	ike	vpnphone-ike	Edit	Remove

4.7. VPN

Setting up the VPN tunnel encryption and authentication is a two-phase process.

- Phase 1 covers how the Avaya VPNremote Phone and the Juniper SSG will securely negotiate and handle the building of the tunnel.
- Phase 2 sets up how the data passing through the tunnel will be encrypted at one end and decrypted at the other. This process is carried out on both sides of the tunnel.

Table 3 provides the IKE Proposals used in the sample configuration including the proposal name used by the Juniper SSG.

Phase	Encryption/ Authentication Method	Diffie-Hellman Group	Encryption Algorithm	Hash Algorithm	Life Time (sec)	SSG Proposal Name
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
P1	Pre-Shared Key	2	3DES	MD5	28800	pre-g2-3des-md5
P2	ESP	2	AES128	SHA-1	3600	g2-esp-aes128-sha

Table 3 – IKE P1 /P2 Proposals

4.7.1. AutoKey IKE Gateway Configuration - Phase 1

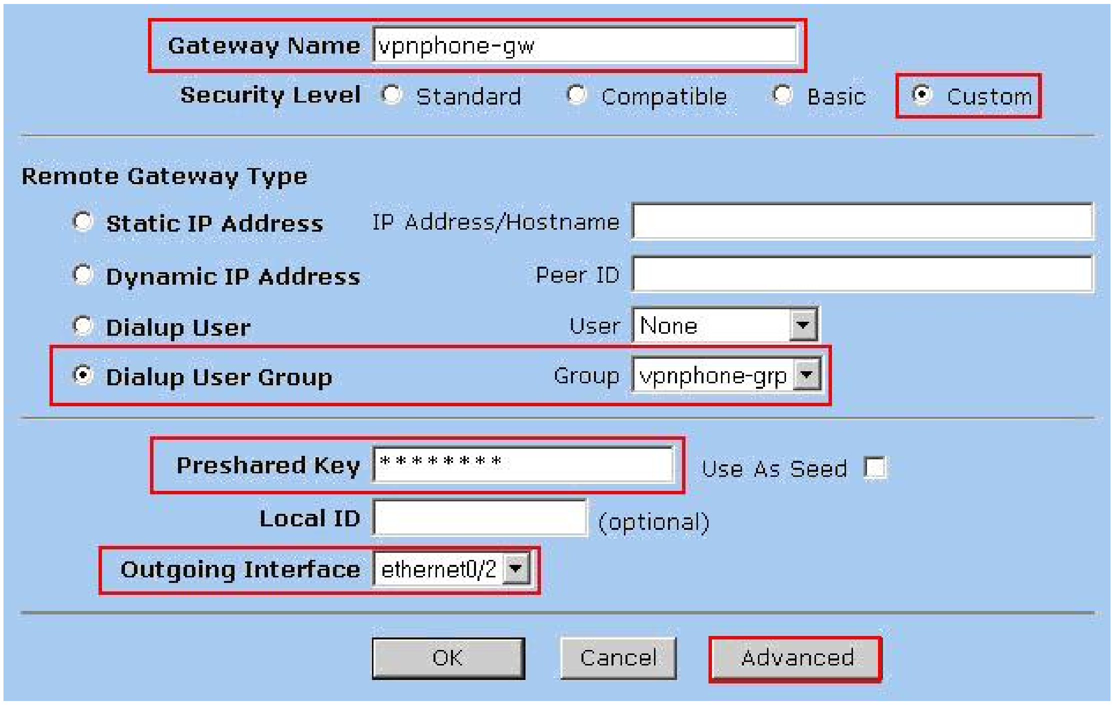
1. From the left navigation menu, select **VPNs > AutoKey Advanced > Gateway.** Select **New.** Configure the highlighted fields shown below. All remaining fields can be left as default.

   Provide a descriptive **Gateway Name**. Selecting **Custom Security Level** provides access to a more complete list of proposals available on this Juniper SSG. Selecting **Dialup User Group** associates the **Group vpnphone-grp** created in **Section 4.6** to this IKE gateway.

   Enter an ASCII text string for a **Preshared Key** that will match the text entered on the Avaya VPNremote Phone.

   Outgoing Interface is the interface which terminates the VPN tunnel.

   Select **Advanced** to access additional configuration options.



Gateway Name: vpnphone-gw

Security Level: ○ Standard ○ Compatible ○ Basic ● Custom

Remote Gateway Type

○ Static IP Address — IP Address/Hostname:

○ Dynamic IP Address — Peer ID:

○ Dialup User — User: None

● Dialup User Group — Group: vpnphone-grp

Preshared Key: ******** Use As Seed □

Local ID: (optional)

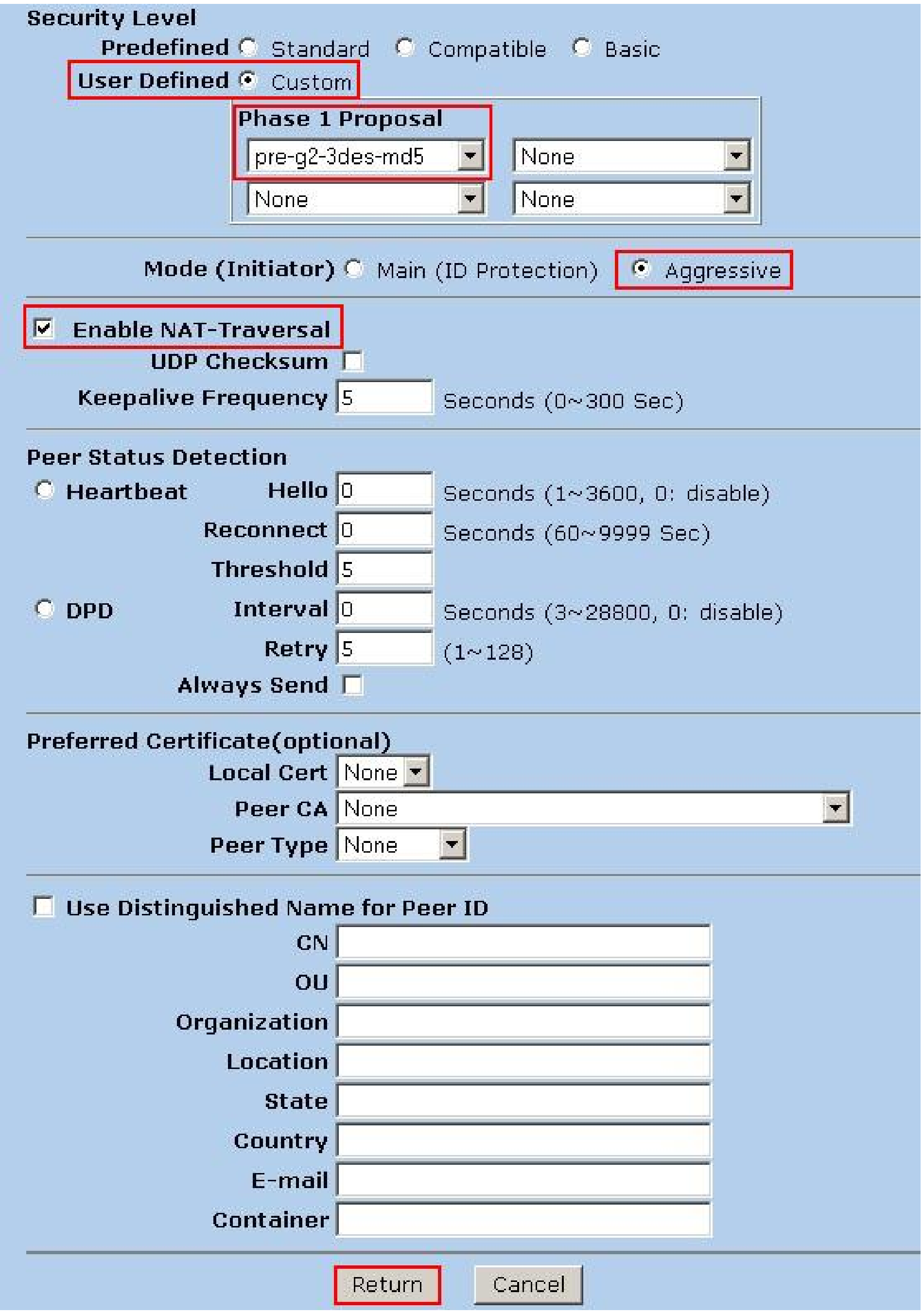
Outgoing Interface: ethernet0/2

2. Configure the highlighted fields shown on the next page. All remaining fields can be left as default. Select **Return** to complete the advanced configuration, and then **OK** to save.

   Select **Security Level** of Custom and the appropriate **Phase 1 Proposal** from the drop down menu. Refer to **Table 3 – IKE P1 / P2 Proposals**.

Aggressive Mode must be used for end-point negotiation such as the Avaya VPNremote Phone.

Enable NAT-Traversal allows IPSec traffic after Phase 2 negotiations are complete to traverse a Network Address Translation (NAT) device The Juniper SSG first checks if a NAT device is present in the path between itself and the Avaya VPNremote Phone. If a NAT device is detected, the Juniper SSG uses UDP to encapsulate each IPSec packet.



Security Level

Predefined ○ Standard ○ Compatible ○ Basic

User Defined ● Custom

Phase 1 Proposal

pre-g2-3des-md5	None
None	None

Mode (Initiator) ○ Main (ID Protection) ● Aggressive

☑ Enable NAT-Traversal

UDP Checksum □

Keepalive Frequency 5 Seconds (0~300 Sec)

Peer Status Detection

○ Heartbeat Hello 0 Seconds (1~3600, 0: disable)

Reconnect 0 Seconds (60~9999 Sec)

Threshold 5

○ DPD Interval 0 Seconds (3~28800, 0: disable)

Retry 5 (1~128)

Always Send □

Preferred Certificate(optional)

Local Cert None

Peer CA None

Peer Type None

□ Use Distinguished Name for Peer ID

CN

OU

Organization

Location

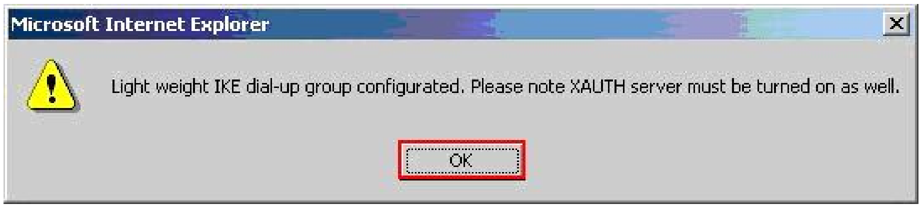
State

Country

E-mail

Container

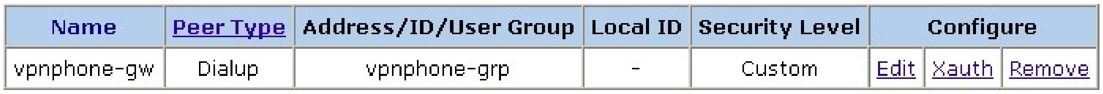
3. Because the IKE group was selected in Step 1 above, a pop-up window similar to the one below is displayed as a reminder to enable the XAuth server. **Section 4.8** provides the XAuth server configuration. Select **OK**.



Microsoft Internet Explorer

Light weight IKE dial-up group configurated. Please note XAUTH server must be turned on as well.

4. The **AutoKey Advanced > Gateway** list page displays the new gateway.



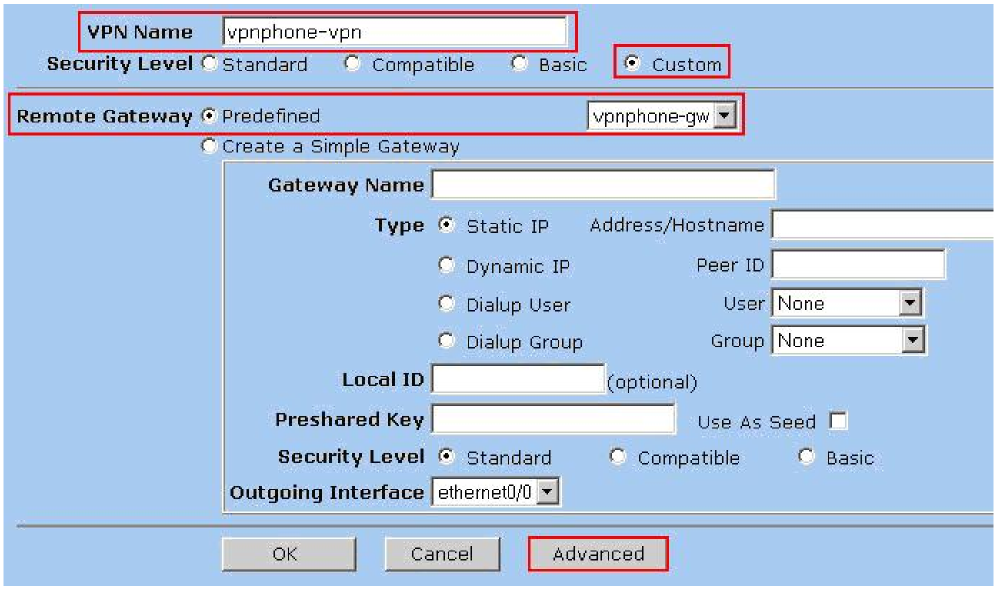
Name	Peer Type	Address/ID/User Group	Local ID	Security Level	Configure		
vpnphone-gw	Dialup	vpnphone-grp	-	Custom	Edit	Xauth	Remove

4.7.2. AutoKey IKE VPN Tunnel Configuration - Phase 2

1. From the left navigation menu, select **VPNs > AutoKey IKE**.
Select **New**. Configure the highlighted fields shown below. All remaining fields can be left as default.

Provide a descriptive **VPN Name**. Selecting **Custom Security Level** provides access to a more complete list of proposals available on the Juniper SSG. Select **Predefined** for **Remote Gateway** and the select the Remote Gateway name entered in **Section 4.7.1**, **vpnphone-gw**, from the drop-down menu,.

Select **Advanced** to access additional configuration options.



VPN Name: vpnphone-vpn

Security Level: ○ Standard ○ Compatible ○ Basic ● Custom

Remote Gateway: ● Predefined vpnphone-gw
○ Create a Simple Gateway

Gateway Name:

Type: ● Static IP Address/Hostname:
○ Dynamic IP Peer ID:
○ Dialup User User: None
○ Dialup Group Group: None

Local ID: (optional)

Preshared Key: Use As Seed □

Security Level: ● Standard ○ Compatible ○ Basic

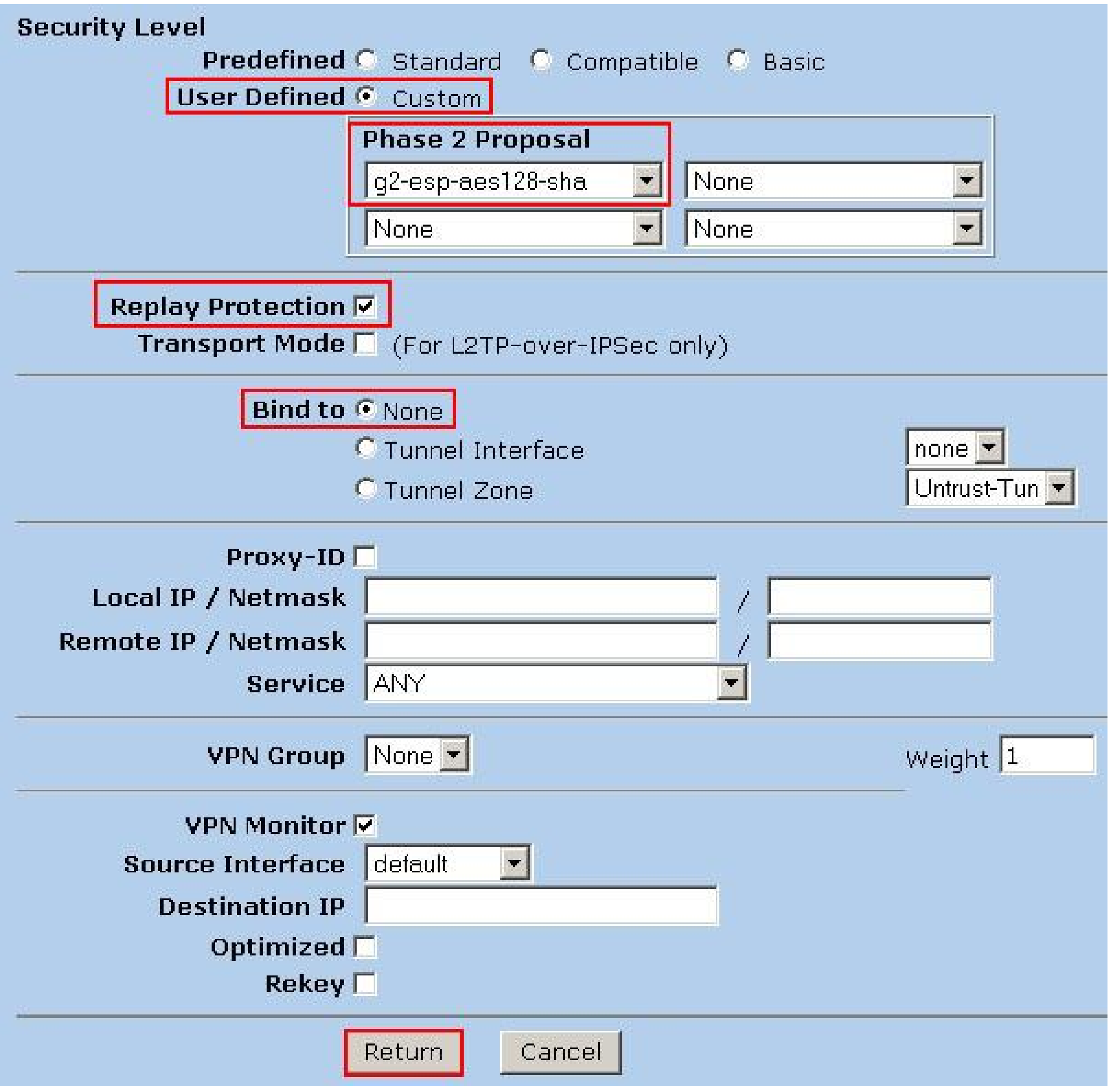
Outgoing Interface: ethernet0/0

2. Configure the highlighted fields shown below. All remaining fields can be left as default. Select **Return** to complete the advanced configuration, and then **OK** to save.

Select **Security Level** of Custom and the appropriate **Phase 2 Proposal** from the drop down menu. Refer to **Table 3 – IKE P1 / P2 Proposals**.

Replay Protection protects the encrypted IPSec traffic from man-in-the-middle replay attacks by including a sequence number with each IKE negotiation between the IKE endpoints.

Bind to None uses the outgoing interface, Ethernet 0/2, for all VPN tunnel traffic.



Security Level
Predefined ○ Standard ○ Compatible ○ Basic
User Defined ● Custom

Phase 2 Proposal
g2-esp-aes128-sha None
None None

Replay Protection ☑
Transport Mode □ (For L2TP-over-IPSec only)

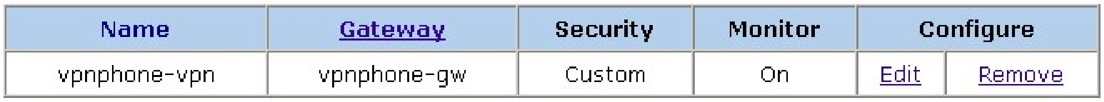
Bind to ● None
○ Tunnel Interface none
○ Tunnel Zone Untrust-Tun

Proxy-ID □
Local IP / Netmask /
Remote IP / Netmask /
Service ANY

VPN Group None Weight 1

VPN Monitor ☑
Source Interface default
Destination IP
Optimized □
Rekey □

3. The **AutoKey IKE** list page displays the new IKE VPN:



Name	Gateway	Security	Monitor	Configure	
vpnphone-vpn	vpnphone-gw	Custom	On	Edit	Remove

4.8. XAuth Configuration

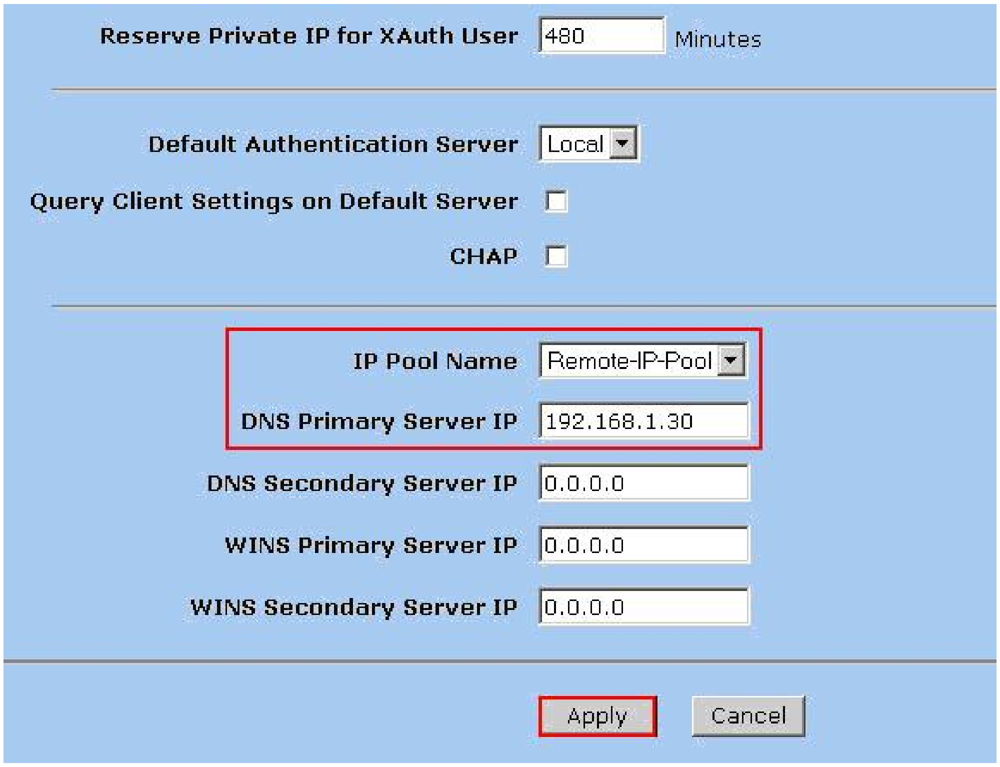
The Juniper SSG has a "local" XAuth server integrated within the ScreenOS operating system. Alternatively, an external Radius server can be used.

These Application Notes implement the "local" ScreenOS XAuth server. The following steps configure the default and IKE gateway specific settings of the local XAuth server.

4.8.1. XAuth Server Defaults

1. From the left navigation menu, select **VPNs > AutoKey Advanced > XAuth Settings.** Configure the highlighted fields shown below. All remaining fields can be left as default. Select **Apply** when complete.

   Select the **IP Pool Name** created in **Section 4.3** from the drop down menu. This defines the IP Address range used when IP addresses are dynamically assigned to the Avaya VPNremote Phone by the XAuth server during IKE setup. DNS and WINS IP addresses are also dynamically assigned by the XAuth server.

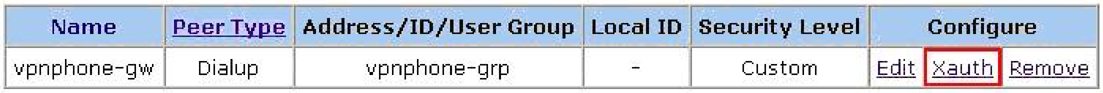


Reserve Private IP for XAuth User	480 Minutes
Default Authentication Server	Local
Query Client Settings on Default Server	□
CHAP	□
IP Pool Name	Remote-IP-Pool
DNS Primary Server IP	192.168.1.30
DNS Secondary Server IP	0.0.0.0
WINS Primary Server IP	0.0.0.0
WINS Secondary Server IP	0.0.0.0

4.8.2. Enable XAuth Authentication for AutoKey IKE gateway

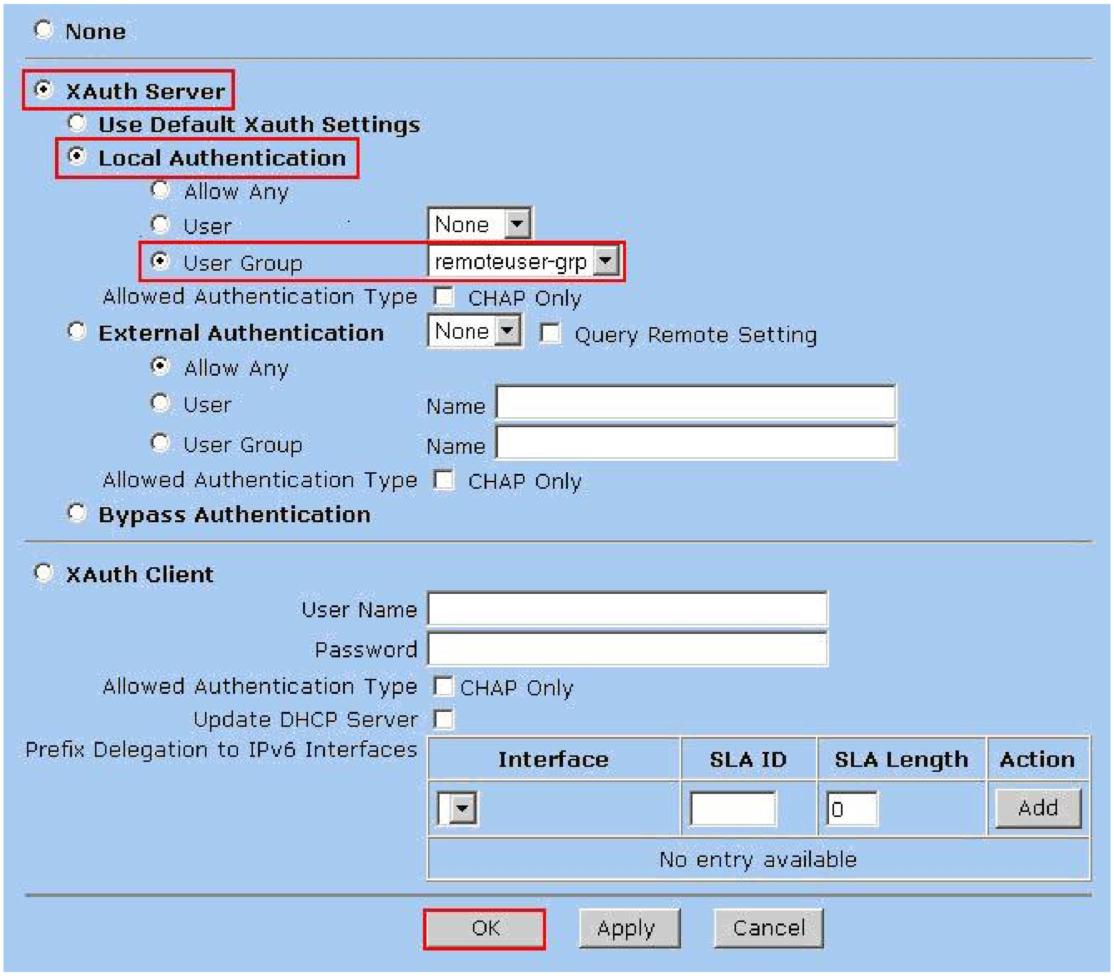
1. From the left navigation menu, select **VPNs > AutoKey Advanced > Gateway.** The list page displays the IKE gateway created in **Section 4.7.1** as shown below.

   Select **Xauth** under the **Configure** column for the vpnphone-gw IKE gateway.



Name	Peer Type	Address/ID/User Group	Local ID	Security Level	Configure
vpnphone-gw	Dialup	vpnphone-grp	-	Custom	Edit Xauth Remove

2. Configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** when complete to save settings.



○ None

● XAuth Server

○ Use Default Xauth Settings

● Local Authentication

○ Allow Any

○ User None

● User Group remoteuser-grp

Allowed Authentication Type □ CHAP Only

○ External Authentication None □ Query Remote Setting

● Allow Any

○ User Name

○ User Group Name

Allowed Authentication Type □ CHAP Only

○ Bypass Authentication

○ XAuth Client

User Name

Password

Allowed Authentication Type □ CHAP Only

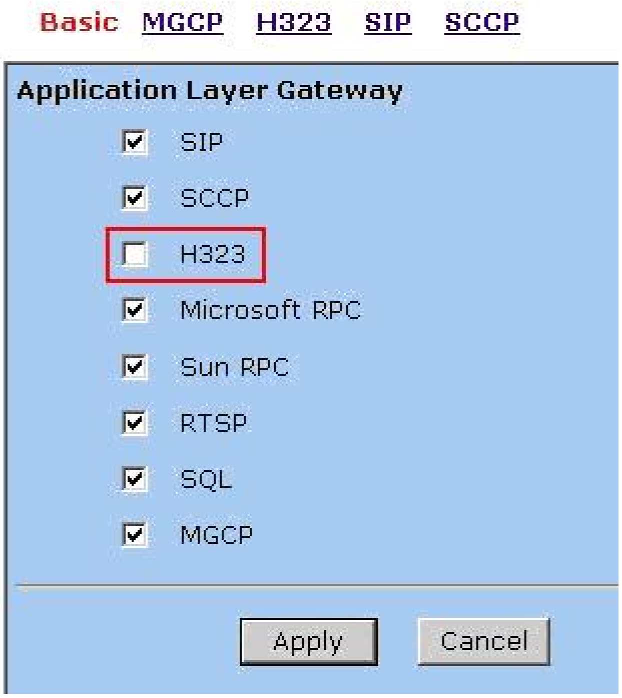
Update DHCP Server □

Prefix Delegation to IPv6 Interfaces

Interface	SLA ID	SLA Length	Action
		0	Add
No entry available			

4.9. H.323 ALG

1. From the left navigation menu, select **Configuration > Advanced > ALG > Configure.** Un-check the **H323** check box to globally disable the H.323 Application Layer Gateway.



Application Layer Gateway

☑ SIP

☑ SCCP

□ H323

☑ Microsoft RPC

☑ Sun RPC

☑ RTSP

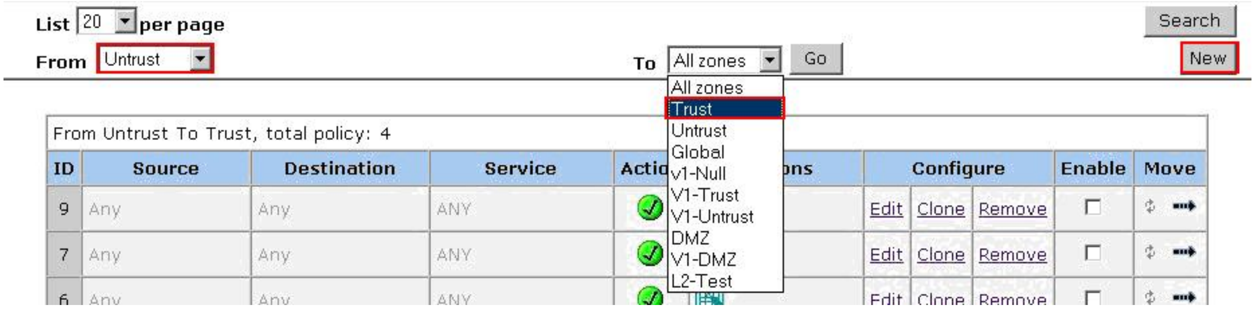
☑ SQL

☑ MGCP

4.10. Security Policies

1. From the left navigation menu select **Policies.** Any currently configured security policies are displayed.

   Create a security policy for traffic flowing from the Untrust zone to the Trust zone. On the top of the **Policies** page select **Untrust** on the **From** drop-down menu and **Trust** on the **To** drop-down menu. Select the **New** button on top right corner of page to create the new security policy.



List 20 per page

From Untrust

To All zones

From Untrust To Trust, total policy: 4

ID	Source	Destination	Service	Actio	ons	Configure			Enable	Move
9	Any	Any	ANY	✓		Edit	Clone	Remove	□	⇕ ➡
7	Any	Any	ANY	✓		Edit	Clone	Remove	□	⇕ ➡
6	Any	Any	ANY	✓		Edit	Clone	Remove	□	⇕ ➡

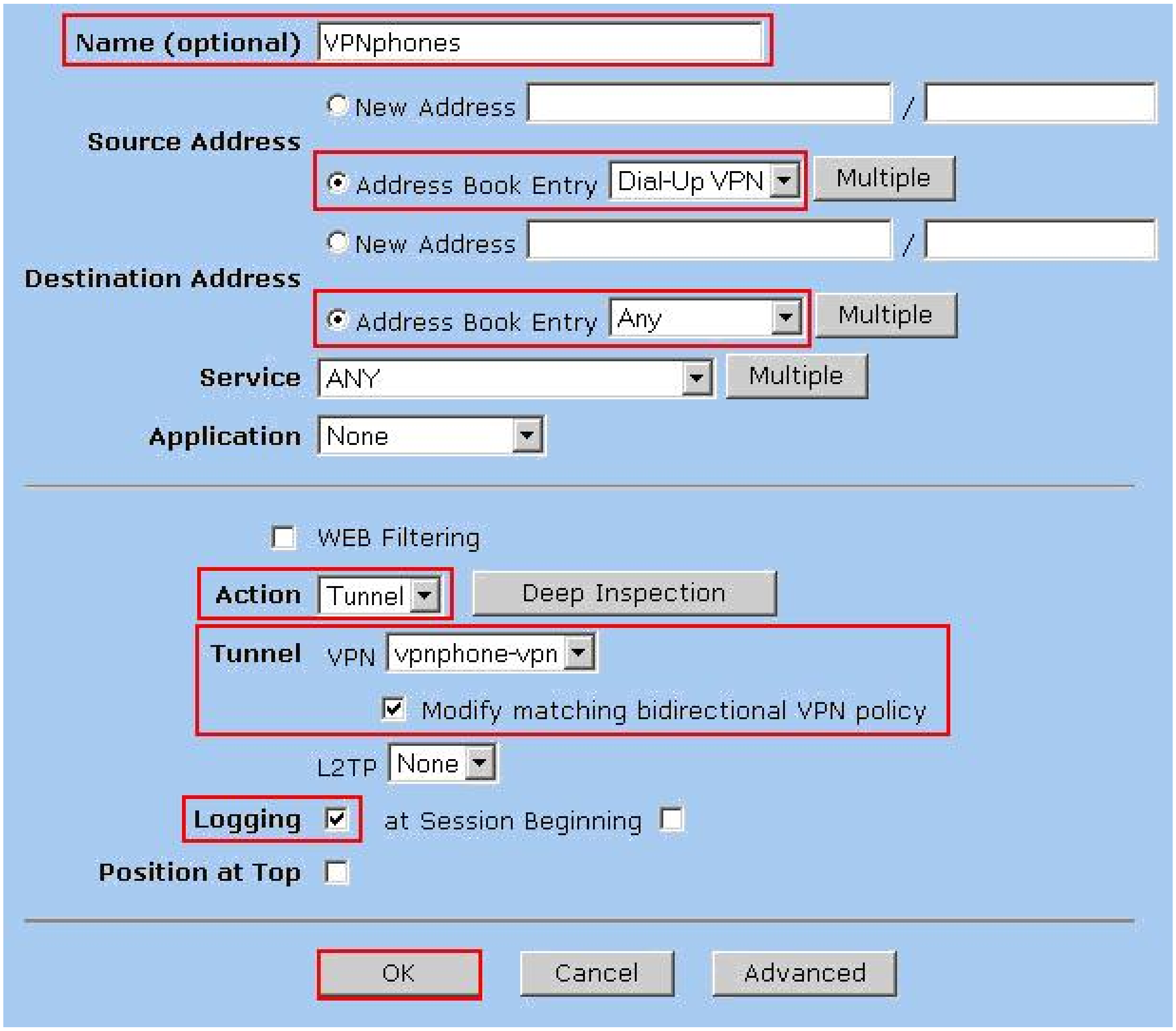
2. Configure the highlighted fields shown below. All remaining fields can be left as default. Select **OK** when complete to save settings. Enter a descriptive policy **Name** to easily identify this policy in the policy list and logs.

Selecting Dial-Up VPN from the **Source Address** drop down menu and Any from the **Destination Address** defines the VPN tunnel as the traffic originator.

Selecting Tunnel from the **Action** field drop down menu indicates the action the SSG will take against traffic that matches the first three criteria of the policy: Source Address, Destination Address, and Service. All matching traffic will be associated with a particular VPN Tunnel specified in the Tunnel field.

Selecting vpnphone-vpn from the **Tunnel VPN** drop down menu associates the VPNremote Phone VPN tunnel to the Action.

Check the **Modify matching bidirectional VPN policy** to have the SSG create a matching VPN policy for traffic flowing in the opposite direction.



Name (optional) VPNphones

Source Address
○ New Address /
● Address Book Entry Dial-Up VPN

Destination Address
○ New Address /
● Address Book Entry Any

Service ANY

Application None

□ WEB Filtering

Action Tunnel

Tunnel VPN vpnphone-vpn

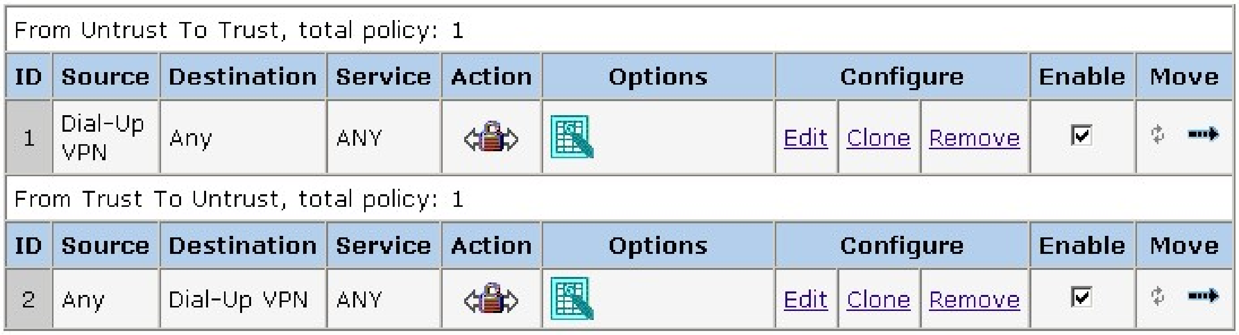
☑ Modify matching bidirectional VPN policy

L2TP None

Logging ☑ at Session Beginning □

Position at Top □

4. The Policies list page displays the new Dial-Up VPN policy:



From Untrust To Trust, total policy: 1

ID	Source	Destination	Service	Action	Options	Configure			Enable	Move
1	Dial-Up VPN	Any	ANY	🔒	▦	Edit	Clone	Remove	☑	↕ ➡

From Trust To Untrust, total policy: 1

ID	Source	Destination	Service	Action	Options	Configure			Enable	Move
2	Any	Dial-Up VPN	ANY	🔒	▦	Edit	Clone	Remove	☑	↕ ➡

5. Avaya VPNremote Phone Configuration

5.1. VPNremote Phone Firmware

The Avaya VPNremote Phone firmware must be installed on the phone prior to the phone being deployed in the remote location. See *VPNremote for the 4600 Series IP Telephones Release 2.0 Administrator Guide* for details on installing VPNremote Phone firmware. The firmware version of Avaya IP telephones can be identified by viewing the version displayed on the phone upon boot up or when the phone is operational by selecting the **Options** hard button → **View IP Settings** soft button → **Miscellaneous** soft button → **Right arrow** hard button. The Application file name displayed denotes the installed firmware version.

As displayed in **Table 2 – Equipment and Software Validated**, VPNremote Phone firmware includes the letters **VPN** in the name. This allows for easy identification of firmware versions incorporating VPN capabilities.

5.2. Configuring Avaya VPNremote Phone

The Avaya VPNremote Phone configuration can be administered centrally from an HTTP/TFTP server or locally on the phone. These Application Notes utilize the local phone configuration method. See **Section 11** *VPNremote for the 4600 Series IP Telephones Release 2.0 Administrator Guide* for details on centralized configuration.

1. There are two methods available to access the **VPN Configuration Options** menu from the VPNremote Phone.

   a. **During Telephone Boot:**

   During the VPNremote Phone boot up, the option to press the * key to enter the local configuration mode is displayed on the telephones screen as shown below.

```
DHCP
* to program
```

   When the * key is pressed, several configuration parameters are presented such as the phones IP Address, the Call Servers IP Address, etc. Press # to accept the current settings or set to an appropriate value. The final configuration option displayed is the VPN Start Mode option shown below. Press the * key to enter the VPN Options menu.

```
VPN Start Mode: Boot
*=Modify  #=OK
```

b. During Telephone Operation:

While the VPNremote Phone is in an operational state, i.e. registered with Avaya Communication Manager, press the following key sequence on the telephone to enter VPN configuration mode:

Mute-V-P-N-M-O-D-# (Mute-8-7-6-6-6-3-#)

The follow is displayed:

```
VPN Start Mode: Boot
*=Modify  #=OK
```

Press the * key and the VPN Options menu to enter the VPN Options menu.

2. The following VPN configuration options are displayed. The settings highlighted below are from the VPNremote Phone of user owen. For detailed description of each VPN configuration option, see **Section 11** *VPNremote for the 4600 Series IP Telephones Release 2.0 Administrator Guide.*

Server:	**100.2.2.100** (Public Eth2 address of SSG A)
User Name:	**owen**
Password:	**xxxxx** (Must match XAuth user password entered in Section 4.5.2)
Group Name:	**vpnphone@avaya.com**
Group PSK:	**xxxxx** (Must match PreShared Key entered in Section 4.7.1)
VPN Start Mode:	**BOOT**
Profile: Modify:	**Juniper Xauth with PSK** (Press **Profile** softbutton to access)

Press the ► hard button to access next screen with the following VPN configuration options.

Password Type:	**Save in Flash** (User not prompted at phone boot)
Encapsulation	**4500-4500**
Syslog Server:	
IKE Parameters:	**DH2-ANY-ANY**
IKE ID Type:	**USER-FQDN**
Diffie-Hellman Group:	**2**
Encryption Alg:	**Any**
Authentication Alg:	**Any**
IKE Xchg Mode:	**Aggressive**
IKE Config Mode:	**Enable**
IPSec Parameters:	**DH2-ANY-ANY**
Encryption Alg:	**Any**

Authentication Alg:	**Any**
Diffie-Hellman Group:	**2**
Protected Net:	
Remote Net #1:	**0.0.0.0/0**

From the telephone keypad, press the telephone ► hard button to access the next screen with the following VPN configuration options.

Copy TOS:	**No**
File Srvr:	**192.168.1.30**
Connectivity Check:	**First Time**

When the VPN configuration options have been set, press the **Done** softbutton. The following is displayed. Select # to save the configuration and the reboot phone.

```
Save new values ?
*=no  #=yes
```

6. Extreme 3804 Configuration

The focus of these Application Notes is on the configuration of the Juniper SSG and Avaya VPNremote Phone. Therefore, the network infrastructure configuration is not described. However, the addition of route entries for the IP Pool Addresses defined in **Section 4** in the private corporate network is required.

6.1. Add IP Route to VPN IP Address Pool network

Although the Extreme 3804 supports several dynamic routing protocols, static routes have been utilized these Application Notes. The **`config iproute add`** CLI command is used to add the static route entries for the IP Pool Address ranges defined in the Juniper SSG A and Juniper SSG B. The **sh iproute** command confirms the two new entries are in the route table.

```
* Alpine3804:4 # config iproute add 50.50.100.0 / 24 192.168.1.199
* Alpine3804:4 # config iproute add 50.50.130.0 / 24 192.168.1.196

* Alpine3804:11 # sh iproute

Ori Destination      Gateway       Mtr   Flags        VLAN     Duration
*s  50.50.100.0/24  192.168.1.198  1     UG---S-um--  voice    0d:0h:00m:18s
*s  50.50.130.0/24  192.168.1.196  1     UG---S-um--  voice    0d:0h:00m:18s
```

7. Avaya Communication Manager Configuration

All the commands discussed in this section are executed on Avaya Communication Manager using the System Access Terminal (SAT). This section assumes that basic configuration on Avaya Communication Manager has been already completed.

7.1. VPNremote Phone Configuration

An Avaya VPNremote Phone is configured the same as other IP telephones within Avaya Communication Manager. Even though the Avaya VPNremote Phone is physically located outside of the corporate network, the AvayaVPNremote Phone will behave the same as other Avaya IP telephones located locally on the corporate LAN once the VPN tunnel has been established.

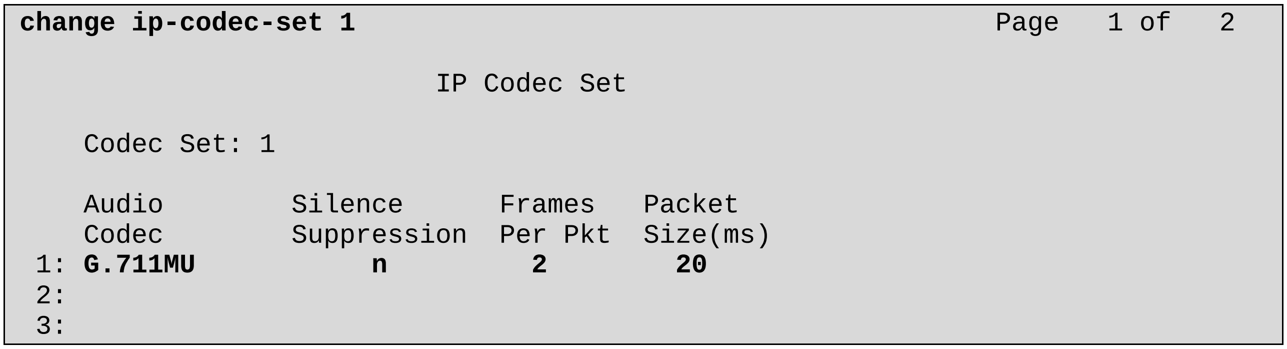
For additional information regarding Avaya Communication Manager configuration, see the *Administrator Guide for Avaya Communication Manager*.

7.2. IP Codec Sets Configuration

These Application Notes utilize the G.711 codec for the Main Campus location (Network Region 1) and the G.729 codec (3 Frames Per Pkt 30ms) for the Remote Office locations with Avaya VPNremote Phones deployed. The high compression of the G.729 codec accommodates the limited bandwidth of the remote office WAN connection (i.e. DSL or Cable).

For more information on configuring codecs, please see *Setting WAN Bandwidth Limits between Network Regions* section of the *Administrators Guide for Avaya Communication Manager*.

Use the **`change ip-codec-set 1`** command to define the G.711 codec as shown below.



```
change ip-codec-set 1                                        Page   1 of   2

                          IP Codec Set

    Codec Set: 1

    Audio        Silence      Frames   Packet
    Codec        Suppression  Per Pkt  Size(ms)
 1: G.711MU           n         2        20
 2:
 3:
```

Use the **`change ip-codec-set 2`** command to define the G.729 codec as shown below.

```
change ip-codec-set 2                                         Page   1 of   2

                          IP Codec Set

    Codec Set: 2

    Audio        Silence      Frames   Packet
    Codec        Suppression  Per Pkt  Size(ms)
 1: G.729             n         3        30
 2:
 3:
```

Use the **`list ip-codec-set`** command to verify the codec assignments.

```
list ip-codec-set

                                IP CODEC SETS

Codec  Codec 1     Codec 2     Codec 3     Codec 4     Codec 5
Set

  1    G.711MU
  2    G.729
  3    G.711MU
  4    G.711MU
```

7.3. IP Network Map Configuration

Use the **`change ip-network-map`** command to define the IP addresses mapped to Network Region 2 and 3 as shown below. Refer to **Table 1 – Network Region Mappings** and **Figure 1: Physical Network** in **Section 2**.

```
change ip-network-map                                         Page   1 of  32
                         IP ADDRESS MAPPING

                                                              Emergency
                                     Subnet                   Location
 From IP Address  (To IP Address   or Mask)  Region    VLAN   Extension
 50 .50 .100.1        .   .   .       24      2        n
 50 .50 .130.1        .   .   .       24      3        n
    .   .   .         .   .   .                        n
    .   .   .         .   .   .                        n
```

7.4. IP Network Regions Configuration

Use the **`change ip-network-region 1`** command to configure Network Region 1 parameters. Configure the highlighted fields shown below. All remaining fields can be left as default.

Select a descriptive name for **Name**. **Intra-region** and **Inter-region IP-IP Direct Audio** determines the flow of RTP audio packets. Setting to yes enables the most efficient audio path be taken. **Codec Set 1** is used for Network Region 1 as described in **Section 7.2**.

```
change ip-network-region 1                                      Page   1 of  19


                               IP NETWORK REGION
  Region: 1
Location: 1      Authoritative Domain: avaya.com
    Name: Main Campus
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: yes
      Codec Set: 1              Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 2048                      IP Audio Hairpinning? y
   UDP Port Max: 3327
DIFFSERV/TOS PARAMETERS                  RTCP Reporting Enabled? y
 Call Control PHB Value: 46      RTCP MONITOR SERVER PARAMETERS
        Audio PHB Value: 46       Use Default Server Parameters? y
        Video PHB Value: 26
802.1P/Q PARAMETERS
 Call Control 802.1p Priority: 6
        Audio 802.1p Priority: 6
        Video 802.1p Priority: 5      AUDIO RESOURCE RESERVATION PARAMETERS
H.323 IP ENDPOINTS                                       RSVP Enabled? n
  H.323 Link Bounce Recovery? y
 Idle Traffic Interval (sec): 20
   Keep-Alive Interval (sec): 5
            Keep-Alive Count: 5
```

Page 3 of the IP-Network-Region form defines the codec set to use for intra-region and inter-region calls. Avaya VPNremote Phones are mapped to Region 2 or 3. Calls within IP Network Region 1 use Codec Set 1 (G.711MU) while calls from IP Network Region 1 to IP Network Region 2 or 3 use Codec Set 2 (G.729).

```
change ip-network-region 1                                      Page   3 of  19

                   Inter Network Region Connection Management

 src dst  codec  direct                                    Dynamic CAC
 rgn rgn   set    WAN    WAN-BW-limits  Intervening-regions   Gateway   IGAR
 1   1     1
 1   2     2       y          :NoLimit                                    n
 1   3     2       y          :NoLimit                                    n
 1   4
```

Use the **`change ip-network-region 2`** command to configure Network Region 2 parameters. Configure the highlighted fields shown below. All remaining fields can be left as default.

```
change ip-network-region 2                                    Page   1 of  19
                               IP NETWORK REGION
  Region: 2
Location:         Authoritative Domain:
    Name: VPN Users – SSG A
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: yes
      Codec Set: 2              Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 2048                      IP Audio Hairpinning? y
   UDP Port Max: 3028
```

Page 3 defines the codec set to use for intra-region and inter-region calls. All calls from IP Network Region 2 will use the G.729 codec as defined by the IP Codec Set in **Section 7.2**

```
change ip-network-region 2                                    Page   3 of  19

                   Inter Network Region Connection Management

 src dst  codec  direct                                       Dynamic CAC
 rgn rgn   set    WAN    WAN-BW-limits  Intervening-regions    Gateway   IGAR
 2   1     2       y           :NoLimit                                    n
 2   2     2
 2   3     2       y           :NoLimit                                    n
 2   4
```

Follow these same steps for configuring IP Network Region 3.

8. Verification Steps

8.1. VPNremote Phone Qtest

Using a feature of the Avaya VPNremote Phone called **Quality test** or **Qtest,** the VPNremote Phone can test the network connection to the VPN head-end gateway to characterize the voice quality an end user is likely to experience.

Once the Avaya VPNremote Phone establishes an IPSec tunnel, registers with Avaya Communication Manager and becomes functional, enter the Avaya VPNremote Phone VPN configuration mode as described in **Section 5.2.** Select the **Qtest** softbutton to enter the Qtest menu. Select the S**tart** softbutton to start Qtest. Note the reported statistics to determine the network connection quality.

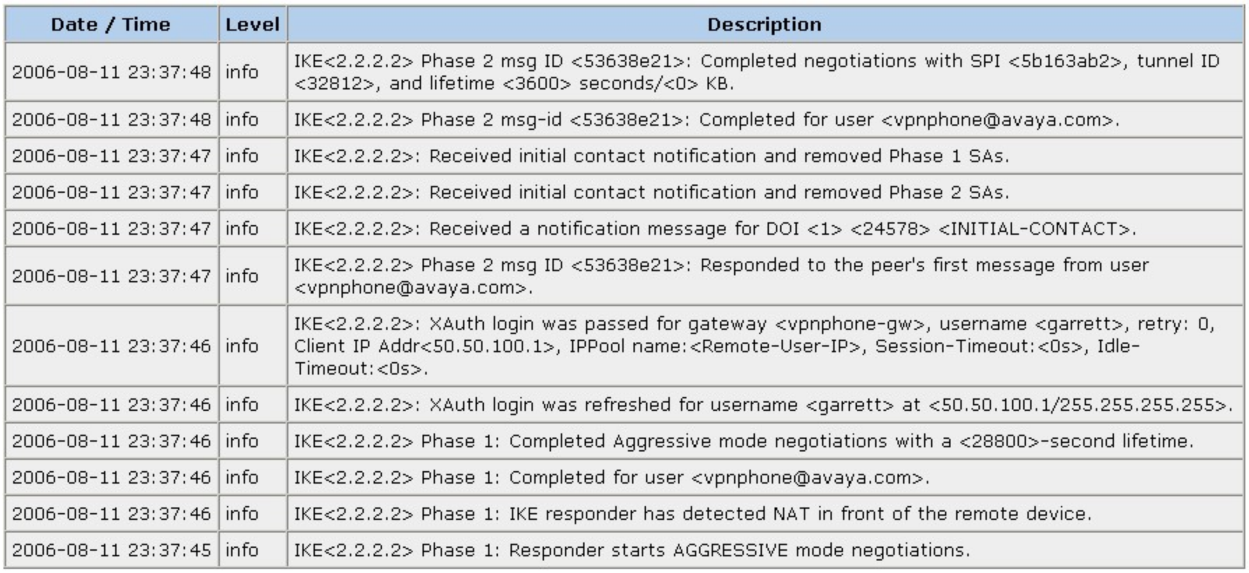
8.2. VPNremote Phone IPSec stats

Once the Avaya VPNremote Phone establishes an IPSec tunnel, registers with Avaya Communication Manager and becomes functional, from the telephone keypad, press the **OPTIONS** hard button (√ icon). From the telephone keypad, press the telephone ► hard button to access the next screen. Select the **VPN Status…** option. There are two screens of IPSec tunnel statistics displayed. Use the ► hard button to access the next screen. Press the **Refresh** softbutton to update the displayed statistics.

8.3. Juniper SSG Debug and Logging

From the Juniper SSG WebUI, select **Reports > System Log > Event Log Level: - information** from the left navigation menu.

The Juniper SSG System Log shown below contains the IKE Phase1, IKE Phase2 and XAuth events logged as an Avaya VPNremote Phone establishes an IPSec tunnel. The screen below shows the events of a single Avaya VPNremote Phone successfully establishing a tunnel.



Date / Time	Level	Description
2006-08-11 23:37:48	info	IKE<2.2.2.2> Phase 2 msg ID <53638e21>: Completed negotiations with SPI <5b163ab2>, tunnel ID <32812>, and lifetime <3600> seconds/<0> KB.
2006-08-11 23:37:48	info	IKE<2.2.2.2> Phase 2 msg-id <53638e21>: Completed for user <vpnphone@avaya.com>.
2006-08-11 23:37:47	info	IKE<2.2.2.2>: Received initial contact notification and removed Phase 1 SAs.
2006-08-11 23:37:47	info	IKE<2.2.2.2>: Received initial contact notification and removed Phase 2 SAs.
2006-08-11 23:37:47	info	IKE<2.2.2.2>: Received a notification message for DOI <1> <24578> <INITIAL-CONTACT>.
2006-08-11 23:37:47	info	IKE<2.2.2.2> Phase 2 msg ID <53638e21>: Responded to the peer's first message from user <vpnphone@avaya.com>.
2006-08-11 23:37:46	info	IKE<2.2.2.2>: XAuth login was passed for gateway <vpnphone-gw>, username <garrett>, retry: 0, Client IP Addr<50.50.100.1>, IPPool name:<Remote-User-IP>, Session-Timeout:<0s>, Idle-Timeout:<0s>.
2006-08-11 23:37:46	info	IKE<2.2.2.2>: XAuth login was refreshed for username <garrett> at <50.50.100.1/255.255.255.255>.
2006-08-11 23:37:46	info	IKE<2.2.2.2> Phase 1: Completed Aggressive mode negotiations with a <28800>-second lifetime.
2006-08-11 23:37:46	info	IKE<2.2.2.2> Phase 1: Completed for user <vpnphone@avaya.com>.
2006-08-11 23:37:46	info	IKE<2.2.2.2> Phase 1: IKE responder has detected NAT in front of the remote device.
2006-08-11 23:37:45	info	IKE<2.2.2.2> Phase 1: Responder starts AGGRESSIVE mode negotiations.

From the Juniper SSG CLI, the ScreenOS **debug ike basic** and **debug ike detail** commands are useful for troubleshooting ISAKMP (IKE) tunnel setup (e.g., detect mis-matched proposals, can't find gateway, etc.).

The **get ike cookies** command is also useful in getting status on existing IKE negotiations by displaying the completed IKE Phase 1 negotiations as shown below.

No active Phase 1 Security Associations:

```
SSG520-> get ike cookies

Active: 0, Dead: 0, Total 0
```

One active Phase 1 Security Association:

```
SSG520-> get ike cookies

Active: 1, Dead: 0, Total 1

1017182f/0006, 2.2.2.2:32831->100.2.2.100:4500, PRESHR/grp2/AES192/SHA,
xchg(4) (vpnphone-gw/
grp6/usr13)
resent-tmr -65536 lifetime 300 lt-recv 86400 nxt_rekey 44 cert-expire 0
responder, err cnt 0, send dir 1, cond 0x0
nat-traversal map:
  keepalive frequency 5 sec
  nat-t udp checksum disabled
  local pri ip 100.2.2.100
  local pri ike port 4500
  local pub ip 0.0.0.0
  local pub ike port 0
  remote pri ip 0.0.0.0
  remote pri ike port 4500
  remote pub ip 2.2.2.2
  remote pub ike port 32831
  internal ip 0.0.0.0
  internal port 0
  natt proto 17
ike heartbeat              : disabled
ike heartbeat last rcv time: 0
ike heartbeat last snd time: 0
XAUTH status: 100
DPD seq local 0, peer 0

SSG520->
```

8.4. Overlapping Network Addresses

During the writing of these Application Notes problems were observed if the private IP address range of the residential router is the same as the private IP address range within the corporate network. In the sample network configuration of these Application Notes, 192.168.1.0 /24 is the private corporate network. The following characteristics occur if the residential router uses the same 192.168.1.0 /24 IP network on the private side of the NAT:

The IPSec tunnel is successfully established from the Avaya VPNremote Phone to the Juniper SSG and the VPNremote phone is assigned a dynamic IP address from the Juniper SSG IP Address pool. However, the VPNremote phone is not able to access the corporate TFTP/HTTP server or Avaya Communication Manager H.323 GateKeeper and goes into “discover mode”.

Changing the private network IP range at the residential router to a range not matching the private corporate network corrects the problem.

9. Conclusion

The Avaya VPNremote Phone combined with Juniper ScreenOS security appliances; SSG, NetScreen and ISG, provide a secure solution for remote worker telephony over any broadband internet connection.

10. Definitions and Abbreviations

The following terminology is used through out this document.

CLAN	Control LAN
IKE	Internet Key Exchange (An IPSec control protocol)
ISAKMP	Internet Security Association and Key Management Protocol
IPSec	Internet Protocol Security
IPSI	IP Services Interface
MD5	Message Digest 5
MEDPRO	Media Processor
NAT	Network Address Translation
PFS	Perfect Forward Secret
Phase 1	IKE negotiations used to create an ISAKMP security association.
Phase 2	IKE negotiations used to create IPSec security associations.
RTP	Real-Time Transport Protocol
SA	Security Association
SHA-1	Secure Hash Algorithm 1.
VPN	Virtual Private Network

11. References

1. **Juniper Networks: Concepts & Examples ScreenOS Reference Guide; Volume 5: Virtual Private Networks** *Release 5.4.0, Rev. A*

   http://www.juniper.net/techpubs/software/screenos/screenos5.4.0/CE_v5.pdf

2. **Secure Services Gateway (SSG) 500 Series Hardware Installation and Configuration Guide** *ScreenOS Version 5.4.0*

   http://www.juniper.net/techpubs/hardware/netscreen-systems/netscreen-systems54/SSG_HW_revA.pdf

3. Cameron R., Cantrell C., Killion D., Russell K., Tam K. (2005) **Configuring NetScreen Firewalls**. Rockland: Syngress Publishing, Inc.

   http://juniper.net/training/jnbooks/configuring_nscn_firewalls.html

4. Avaya VPNremote Phone documentation and software download.

   http://support.avaya.com/japple/css/japple?PAGE=Product&temp.productID=280576&temp.releaseID=280577

5. **Avaya *Administrators Guide for Communication Manager***

   http://support.avaya.com/elmodocs2/comm_mgr/r3/pdfs/03_300509_1.pdf

6. Additional Avaya Application Notes and Resources are available,

   http://www.avaya.com/gcm/master-usa/en-us/resource/

Appendix A: SSG 520 A CLI Configuration

```
set clock timezone 0
set vrouter trust-vr sharable
set vrouter "untrust-vr"
exit
set vrouter "trust-vr"
unset auto-route-export
exit
unset alg h323 enable
set auth-server "Local" id 0
set auth-server "Local" server-name "Local"
set auth default auth server "Local"
set auth radius accounting port 27911
set admin name "netscreen"
set admin password "nKVUM2rwMUzPcrkG5sWIHdCtqkAibn"
set admin user "interop" password "nANqEgr5A3pAcWOEfs6NpNBteXJxQn" privilege
"all"
set admin http redirect
set admin auth timeout 30
set admin auth server "Local"
set admin format dos
set zone "Trust" vrouter "trust-vr"
set zone "Untrust" vrouter "trust-vr"
set zone "DMZ" vrouter "trust-vr"
set zone "VLAN" vrouter "trust-vr"
set zone "Untrust-Tun" vrouter "trust-vr"
set zone "Trust" block
set zone "Trust" tcp-rst
set zone "Trust" asymmetric-vpn
set zone "Untrust" block
set zone "Untrust" tcp-rst
set zone "Untrust" asymmetric-vpn
set zone "MGT" block
set zone "DMZ" tcp-rst
set zone "VLAN" block
set zone "VLAN" tcp-rst
set zone "Untrust" screen tear-drop
set zone "Untrust" screen syn-flood
set zone "Untrust" screen ping-death
set zone "Untrust" screen ip-filter-src
set zone "Untrust" screen land
set zone "V1-Untrust" screen tear-drop
set zone "V1-Untrust" screen syn-flood
set zone "V1-Untrust" screen ping-death
set zone "V1-Untrust" screen ip-filter-src
set zone "V1-Untrust" screen land
set interface "ethernet0/0" zone "Trust"
set interface "ethernet0/1" zone "MGT"
set interface "ethernet0/2" zone "Untrust"
unset interface vlan1 ip
set interface ethernet0/0 ip 192.168.1.199/24
set interface ethernet0/0 nat
set interface ethernet0/1 ip 172.16.254.118/24
set interface ethernet0/1 route
set interface ethernet0/2 ip 100.2.2.100/30
set interface ethernet0/2 route
unset interface vlan1 bypass-others-ipsec
unset interface vlan1 bypass-non-ip
set interface ethernet0/0 ip manageable
unset interface ethernet0/2 ip manageable
unset interface ethernet0/0 manage snmp
set interface ethernet0/0 manage mtrace
unset interface ethernet0/1 manage snmp
set interface vlan1 manage mtrace
unset flow no-tcp-seq-check
set flow tcp-syn-check
set console timeout 15
set pki authority default scep mode "auto"
set pki x509 default cert-path partial
set address "Trust" "0.0.0.0/0" 0.0.0.0 0.0.0.0
set address "Trust" "0.0.0.0/0.0.0.0" 0.0.0.0 0.0.0.0
set user "evan" uid 4
set user "evan" type  xauth
set user "evan" password "IZ7/4vQeNmFM9MsszyCnjHNzgpnDvp01Lg=="
unset user "evan" type auth
set user "evan" "enable"
set user "garrett" uid 3
set user "garrett" type  xauth
set user "garrett" password "Gx7kdgYVNa70FRs0CoCF8CtolDnz3cum1g=="
unset user "garrett" type auth
set user "garrett" "enable"
set user "owen" uid 2
set user "owen" type  xauth
set user "owen" password "xOfx89OCNyMQJ/sPQlCWU1rvHGngirErgg=="
unset user "owen" type auth
set user "owen" "enable"
set user "vpnphone-ike" uid 1
set user "vpnphone-ike" ike-id u-fqdn "vpnphone@avaya.com" share-limit 100
set user "vpnphone-ike" type  ike
set user "vpnphone-ike" "enable"
set user-group "remoteuser-grp" id 3
set user-group "remoteuser-grp" user "evan"
set user-group "remoteuser-grp" user "garrett"
set user-group "remoteuser-grp" user "owen"
set user-group "vpnphone-grp" id 1
set user-group "vpnphone-grp" user "vpnphone-ike"
set ike respond-bad-spi 1
unset ike ikeid-enumeration
unset ipsec access-session enable
set ipsec access-session maximum 5000
set ipsec access-session upper-threshold 0
set ipsec access-session lower-threshold 0
set ipsec access-session dead-p2-sa-timeout 0
unset ipsec access-session log-error
unset ipsec access-session info-exch-connected
unset ipsec access-session use-error-log
set xauth default ippool "Remote-User-IP"
set xauth default dns1 192.168.1.30
set url protocol websense
exit
```

```
set monitor cpu 100
set nsmgmt bulkcli reboot-timeout 60
set ssh version v2
set ssh enable
set config lock timeout 5
set snmp port listen 161
set snmp port trap 162
set vrouter "untrust-vr"
exit
set vrouter "trust-vr"
unset add-default-route
set route 0.0.0.0/0 interface ethernet0/2 gateway 100.2.2.1 preference 20
permanent
set route 50.50.100.0/24 vrouter "untrust-vr" preference 20 metric 1
exit
set vrouter "untrust-vr"
exit
set vrouter "trust-vr"
exit
```

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya Solution & Interoperability Test Lab at interoplabnotes@list.avaya.com