Installation Guide

NCP Client with Juniper ScreenOS

SECURE COMMUNICATIONS

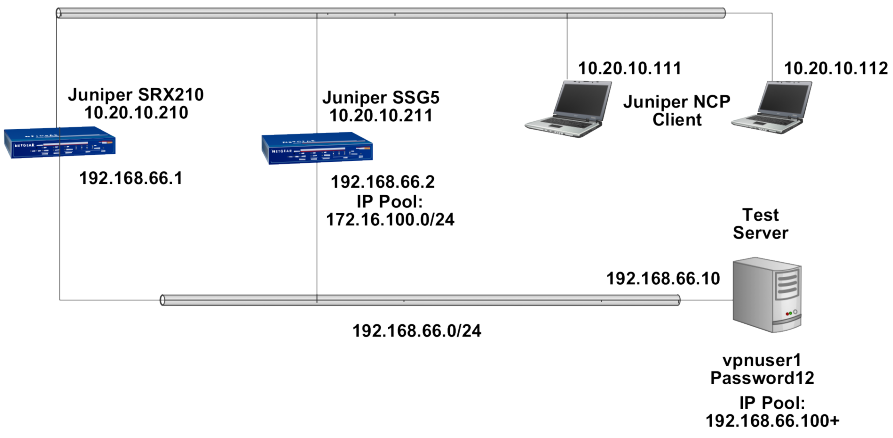
Revision History

Junos Version	NCP Client Version	Date
10.0R3.10	9.22 Build 63	2010-06-23
10.1R1.8		2010-08-18
		2010-09-08
		2010-10-20
10.4R1.9	9.23 Build 64	2011-01-14
11.1R2.3	9.24 Build 65	2011-05-13

This document outlines the configuration of a Junos based Juniper VPN gateway and the NCP VPN client.

Network Diagram

The following simple network is used for testing. The Test Server runs on Windows Server 2008 R2 Enterprise. It runs a Web Server (IIS 7) as well as Network Policy and Access Service, which provides for RADIUS authentication.

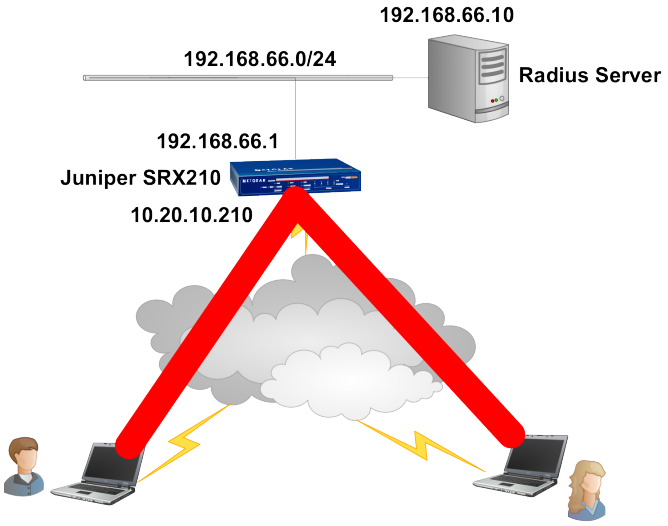


The following document outlines the configuration of a JUNOS based Juniper gateway and the NCP VPN client.

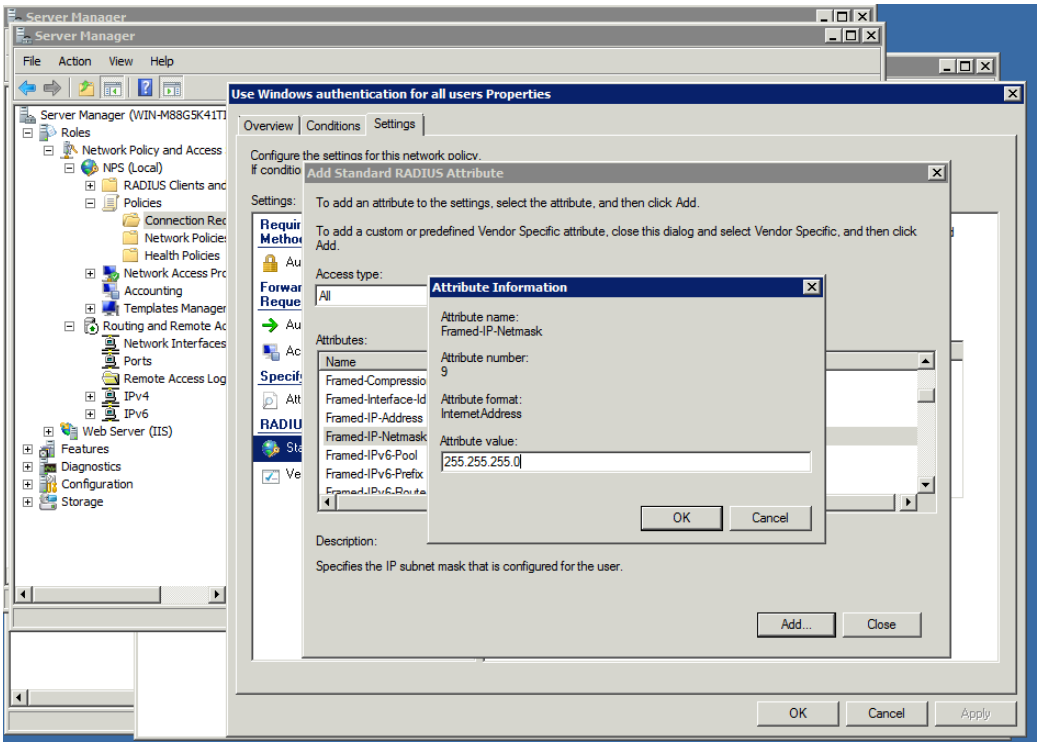
A. Remote Access VPN with Xauth and Radius

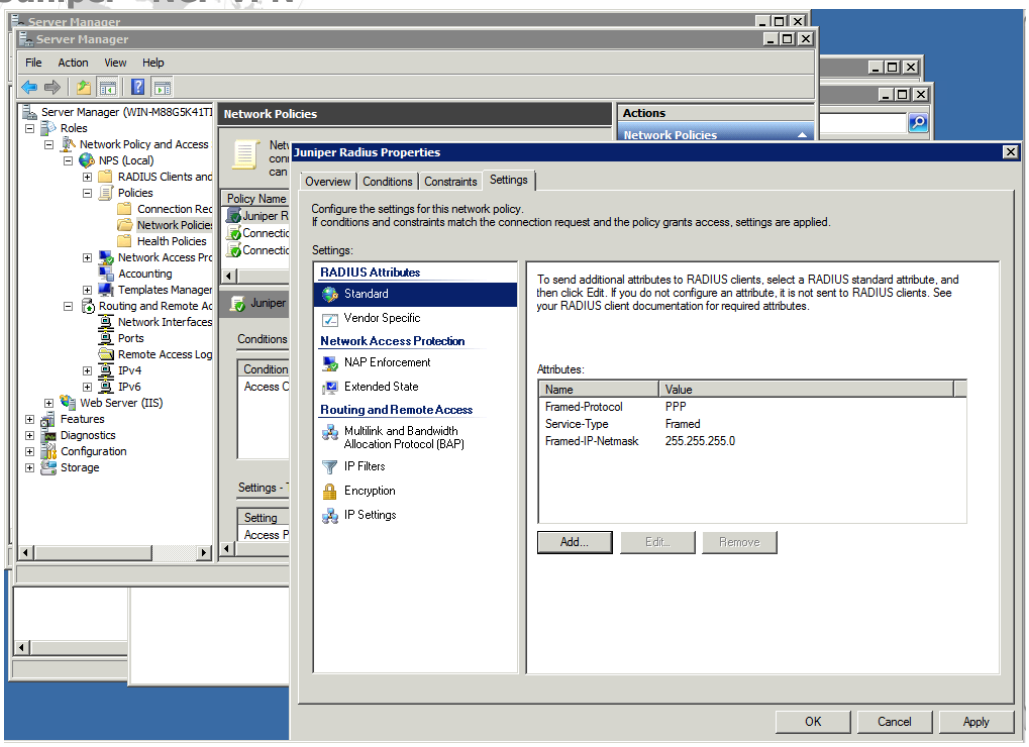
In this example, the following configuration applies:

- Internal LAN interface fe-0/0/7
- Internal LAN interface ge-0/0/0 in zone you create a new group IKE ID user named"*NCP Users"*. You configure it to accept up to 10 Phase 1 negotiations concurrently from VPN clients with preshared keys containing an IKE ID ending with the string *juniper.net*. The seed value for the preshared key is *Tunneling123*. You name the dialup IKE user group *Office.*



RADIUS configuration





In order for the IP address to be passed to the client it is important to define the Framed-IP-Netmask RADIUS attribute as shown here.

Juniper Gateway CLI

1. Interfaces

set interfaces ge-0/0/0 unit 0 family inet address 10.20.10.210/16
set interfaces fe-0/0/7 unit 0 family inet address 192.168.66.1/24

2. Security Zones

set security zones security-zone trust interfaces fe-0/0/7.0
set security zones security-zone untrust interfaces ge-0/0/0.0

3. Host-inbound Services

set security zones security-zone trust host-inbound-traffic system-services all
set security zones security-zone untrust host-inbound-traffic system-services ike
set security zones security-zone untrust host-inbound-traffic system-services ssh
set security zones security-zone untrust host-inbound-traffic system-services ping

4. Address book

set security zones security-zone trust address-book address local-net 192.168.66.0/24

5. Access Profiles

set access profile xauth-users authentication-order radius
set access profile xauth-users session-options client-idle-timeout 180
set access profile xauth-users radius-server 192.168.66.10 port 1812
set access profile xauth-users radius-server 192.168.66.10 secret “secret”

6. IKE Proposals

set security ike proposal PSK-AES128-SHA1-DH2 authentication-method pre-shared-keys
set security ike proposal PSK-AES128-SHA1-DH2 dh-group group2

```
set security ike proposal PSK-AES128-SHA1-DH2 authentication-algorithm sha1
set security ike proposal PSK-AES128-SHA1-DH2 encryption-algorithm aes-128-cbc
set security ike proposal PSK-AES128-SHA1-DH2 lifetime-seconds 28800
set security ike proposal PSK-AES256-SHA1-DH2 authentication-method pre-shared-keys
set security ike proposal PSK-AES256-SHA1-DH2 dh-group group2
set security ike proposal PSK-AES256-SHA1-DH2 authentication-algorithm sha1
set security ike proposal PSK-AES256-SHA1-DH2 encryption-algorithm aes-256-cbc
set security ike proposal PSK-AES256-SHA1-DH2 lifetime-seconds 28800
```

7. IKE Policies

```
set security ike policy dialup-ike-policy mode aggressive
set security ike policy dialup-ike-policy proposals PSK-AES128-SHA1-DH2
set security ike policy dialup-ike-policy pre-shared-key ascii-text “Tunneling123”
```

8. IKE Gateway (Phase 1) with dynamic peer as U-FQDN

```
set security ike gateway dialup-ike ike-policy dialup-ike-policy
set security ike gateway dialup-ike dynamic user-at-hostname user@juniper.net
set security ike gateway dialup-ike external-interface ge-0/0/0
```

9. Shared IKE User Limit and Xauth

```
set security ike gateway dialup-ike dynamic connections-limit 10
set security ike gateway dialup-ike dynamic ike-user-type shared-ike-id
set security ike gateway dialup-ike xauth access-profile xauth-users
```

10. IPsec Proposals

```
set security ipsec proposal ESP-AES128-SHA protocol esp
set security ipsec proposal ESP-AES128-SHA authentication-algorithm hmac-sha1-96
set security ipsec proposal ESP-AES128-SHA encryption-algorithm aes-128-cbc
set security ipsec proposal ESP-AES128-SHA lifetime-seconds 28800
set security ipsec proposal ESP-AES256-SHA protocol esp
set security ipsec proposal ESP-AES256-SHA authentication-algorithm hmac-sha1-96
set security ipsec proposal ESP-AES256-SHA encryption-algorithm aes-256-cbc
set security ipsec proposal ESP-AES256-SHA lifetime-seconds 28800
```

11. IPsec Policies

```
set security ipsec policy dialup-ipsec-policy perfect-forward-secrecy keys group2
set security ipsec policy dialup-ipsec-policy proposals ESP-AES128-SHA
```

12. IPsec VPN with IKE Gateway and IPsec Policy

```
set security ipsec vpn dialup-vpn ike gateway dialup-ike
set security ipsec vpn dialup-vpn ike ipsec-policy dialup-ipsec-policy
set security ipsec vpn dialup-vpn establish-tunnels on-traffic
```

13. IPsec VPN Security Policy for incoming Tunnel Traffic

```
edit security policies from-zone untrust to-zone trust
        ## [edit security policies from-zone untrust to-zone trust]
set policy dialup-unt-tr match source-address any
set policy dialup-unt-tr match destination-address local-net
set policy dialup-unt-tr match application any
set policy dialup-unt-tr then permit tunnel ipsec-vpn dialup-vpn
exit
```

14. Security Policy for Internet Traffic

```
edit security policies from-zone trust to-zone untrust
        ## [edit security policies from-zone trust to-zone untrust]
set policy any-permit match source-address any
```

set policy any-permit match destination-address any
set policy any-permit match application any
set policy any-permit then permit source-nat interface
exit

15. tcp-mss to eliminate fragmentation of TCP traffic across Tunnel

set security flow tcp-mss ipsec-vpn mss 1350

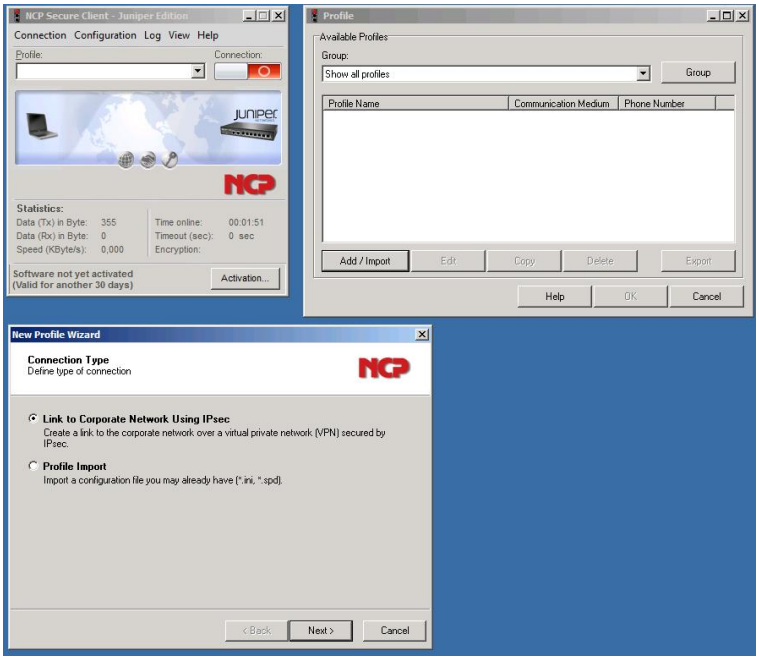
16. Save and commit configuration

commit

NCP Client Wizard:

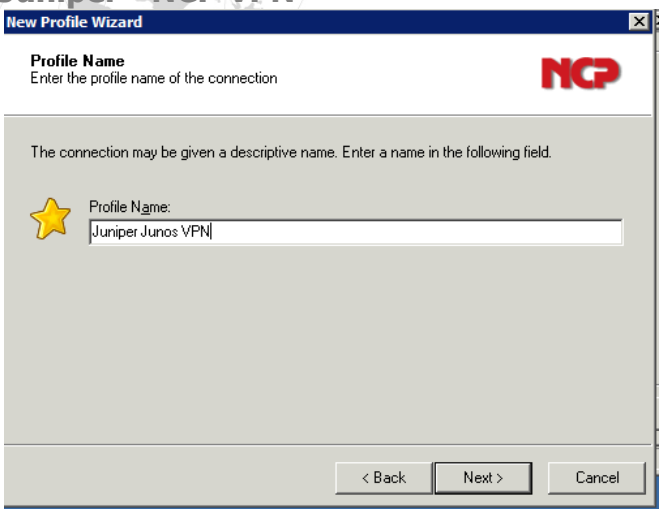
1. Connection Type

Configuration > Profiles > Add/Import
Link to Corporate Network Using IPsec: (select)
> Next



2. Profile Name

Configuration
Profile Name: Juniper Junos VPN

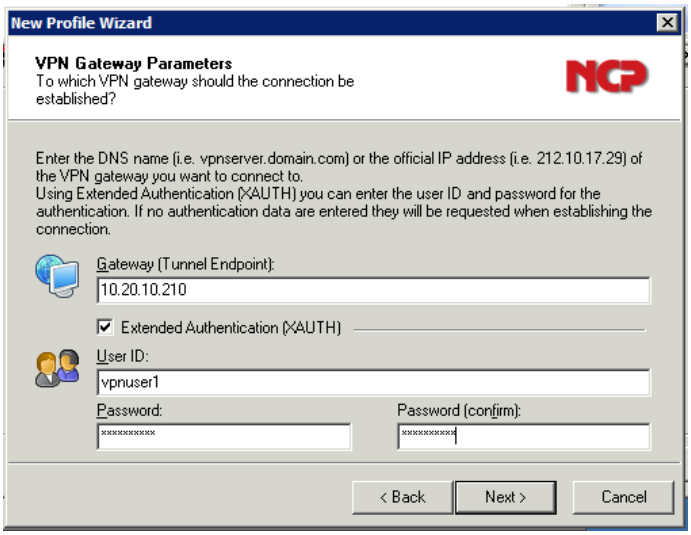


> Next

3. VPN Gateway Parameters

Gateway (Tunnel Endpoint): 10.20.10.210
Extended Authentication (XAUTH): (select)

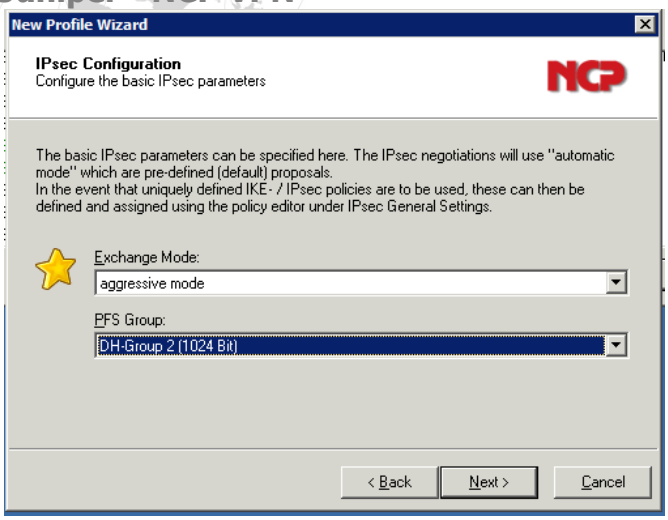
UserID:	vpnuser1
Password:	Password12
Password (confirm):	Password12



> Next

4. Exchange Mode

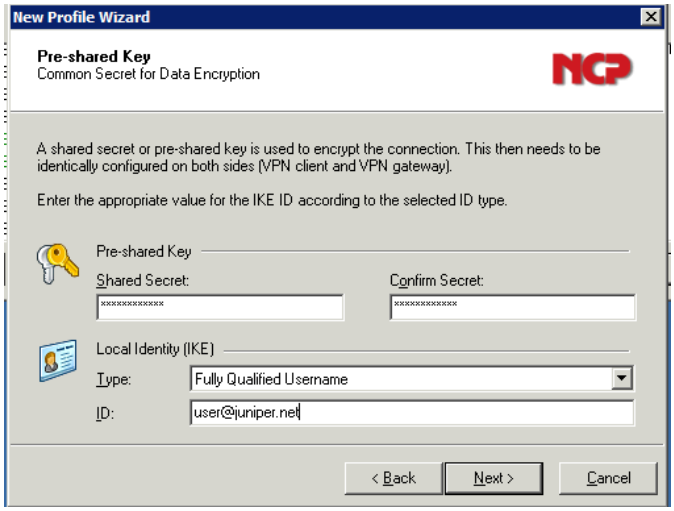
Exchange Mode: aggressive mode
PFS Group: DH-Group 2



> Next

5. Pre-shared Key

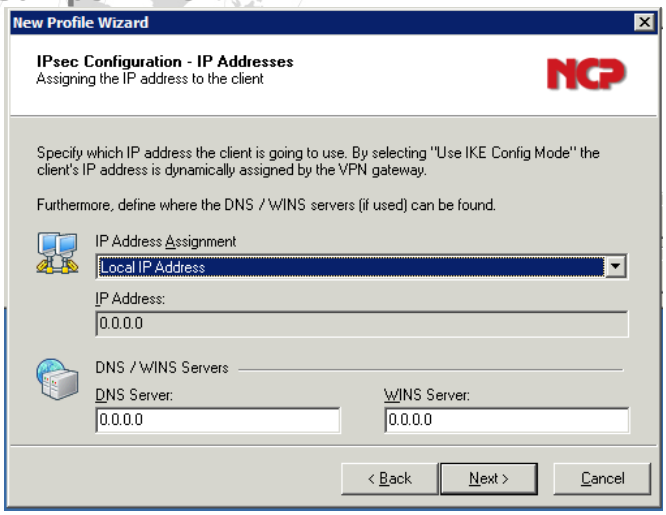
Shared Secret: Tunneling123
Confirm Secret: Tunneling123
Local Identity (IKE): Fully Qualified Username
ID: user@juniper.net



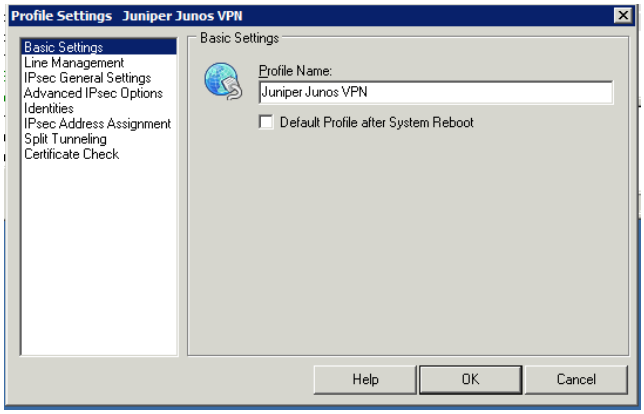
> Next

6. IPsec Configuration: IP Addresses

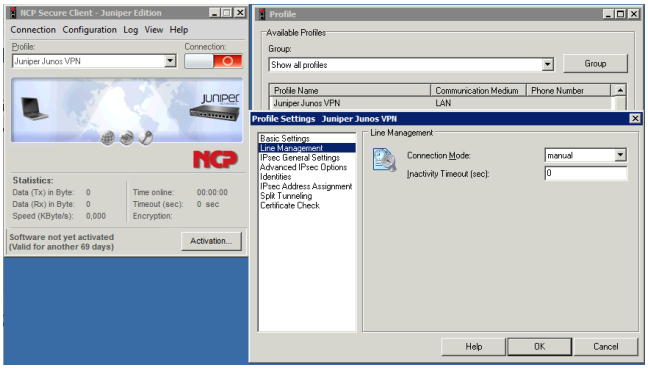
IP Address Assignment: Local IP Address



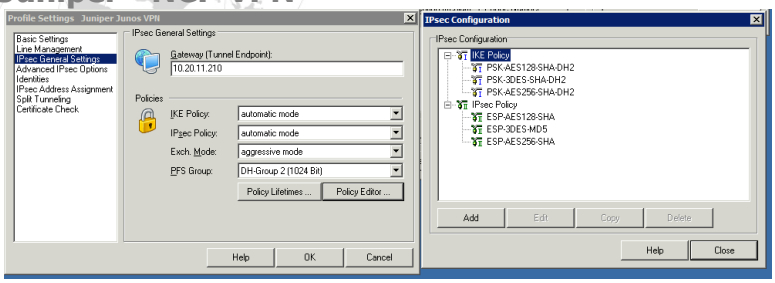
> Next > OK
Edit the Profile to specify specific
Profile > Juniper Junos VPN > Edit

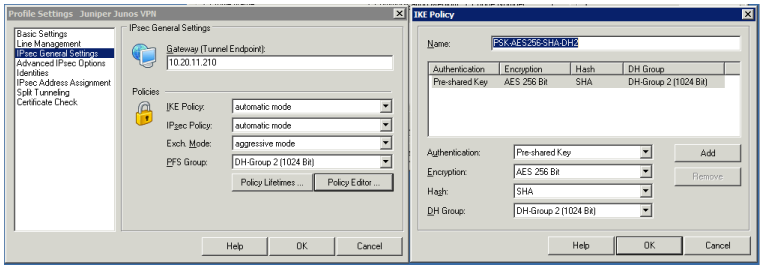


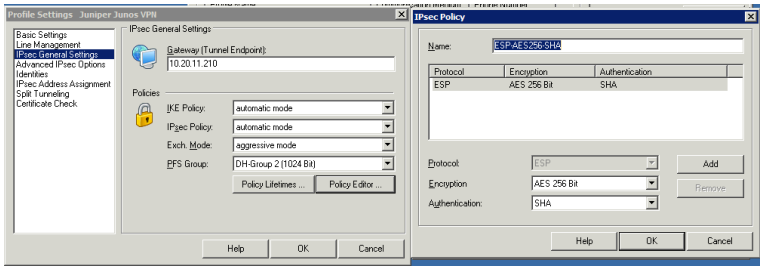
Line Management:
Inactivity Timeout: set to 0



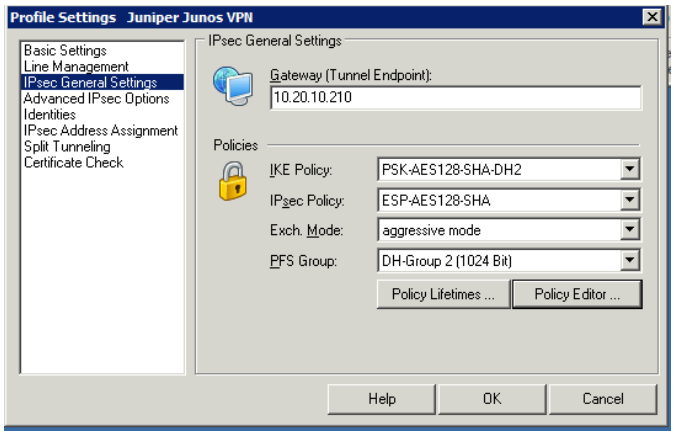
IPsec General Settings:
Policy Editor
Edit and/or Add the appropriate policies as needed



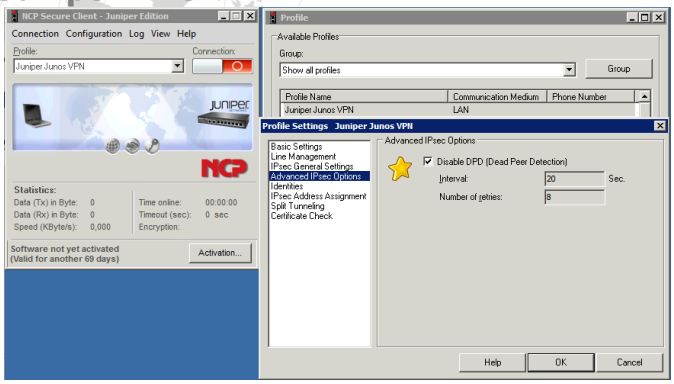




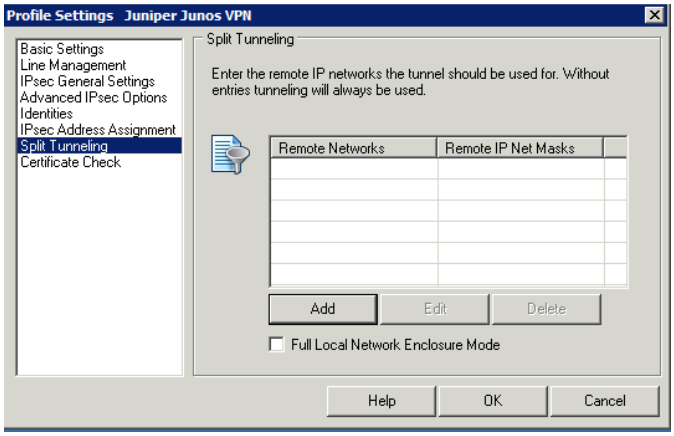
Select the configured policies from the IKE Policy and IPsec Policy drop-down menu

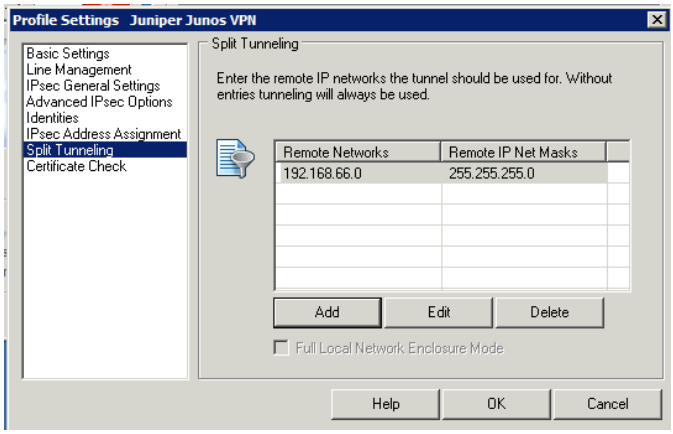


Advanced IPsec Options:
Disable DPD (Dead Peer Detection)
Enable this option by marking the checkbox

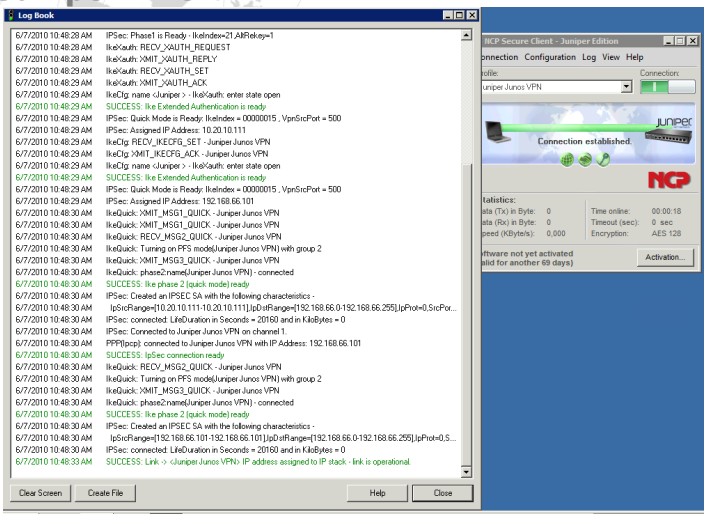


Split Tunneling:
In Remote Networks
enter the VPN network address: 192.168.66.0 / 255.255.255.0





Select OK and close all the windows.
Click the connection button to establish the VPN gateway connection.



B. Remote Access VPN with Xauth and Active Directory

The following configuration is used for Active Directory configuration.

On the Juniper SRX gateway you need to configure the LDAP Server and options:

```
access {
    profile xauth-users {
        authentication-order ldap;
}
    ldap-options {
        base-distinguished-name cn=users,dc=vpnaccess,dc=local;
        search {
            search-filter sAMAccountName=;
            admin-search {
                distinguished-name cn=Administrator,cn=Users,dc=vpnaccess,dc=local;
                password "$9$VebgaZGi.fzDiORSeXxDikqmTz369tu"; ## SECRET-DATA
            }
        }
    }
    ldap-server {
        192.168.66.11;
```

C. Multiple Subnets

If multiple subnets are referenced in the same policy, the proxy-ids 0.0.0.0/0 are used for both local and remote!

```
Apr 20 11:13:47 matched configured proxy ids:
remote=ipv4_subnet(any:0,[0..7]=0.0.0.0/0)
local=ipv4_subnet(any:0,[0..7]=0.0.0.0/0) in vpn: INSTANCE-vpn
ncp_0002_0005_0000.
```

You will need to create multiple policies for this situation. Also you will need to configure as many VPN entries under ipsec and refer to the same gateway, as the same VPN cannot be used in multiple security policies.

Wrong:

```
policy tr-utr-ncp { match { source-address [ LAN-ONE LAN-TWO LAN-THREE ];
                                                    ## Cannot have multiple subnets
destination-address any; application any; } then { permit { tunnel { ipsec-vpn vpn-ncp; }
}            }          }
```

Troubleshooting

The following section provides a few troubleshooting tips.

1. Verifying Firewall User Authentication

   The following section provides information on how to display the firewall authentication user history.

   To provide higher level of debug information, traceoptions can be used in the firewall authentication:

   ```
   firewall-authentication {
   traceoptions {
   flag {
   all <detail | extensive | terse>;
   authentication <detail | extensive | terse>;
   proxy <detail | extensive | terse>;
   ```

   Use the show security firewall-authentication CLI command to display information on authenticated firewall users. For more information, see the *JUNOS Software CLI Reference*.

   ```
   user@host# show security firewall-authentication history
   History of firewall authentication data: Authentications: 2 Id Source Ip
   Date Time Duration Status User 1 99.99.99.1 2007-10-12 21:24:02 0:00:24
   Failed troy  2 99.99.99.1 2007-10-12 21:24:48 0:00:22 Success voyager
   user@host>  show security firewall-authentication history identifier 1
   Username: troy Source IP: 99.99.99.1 Authentication state: Failed
   Authentication method: Pass-through using Telnet Access start date:
   2007-10-12 Access start time: 21:24:02 Duration of user access: 0:00:24
   Policy name: lnx2-telnet-lnx1 Source zone: dl2 Destination zone: dl1
   Access profile: wonder Bytes sent by this user: 0 Bytes received by this
   user: 2660 Client-groups: Sunnyvale Bangalore user@host>  show security
   firewall-authentication users Firewall authentication data: Total users
   in table: 1 Id Source Ip Src zone Dst zone Profile Age Status User  3
   99.99.99.1     dl2   dl1   wonder   1 Failed TechPubs  user@host>  show
   security firewall-authentication users identifier 3 Username: TechPubs
   Source IP: 99.99.99.1 Authentication state: Failed  Authentication
   method: Pass-through using Telnet Age: 1 Access time remaining: 9 Source
   zone: dl2 Destination zone: dl1 Policy name: lnx2-telnet-lnx1 Access
   profile: wonder Interface Name: ge-0/0/1.0 Bytes sent by this user: 0
   Bytes received by this user: 1521
   ```

   What it Means

   The output displays information about firewall users authenticating to the network. Verify the following information:

- Number of firewall users who successfully authenticated and firewall users who failed to log in.
- Details on each firewall user trying to authenticate.

2. Traceoptions (Flow)

Syntax

traceoptions {

file *filename* <files *number* > <match *regular-expression* > <size *maximum-file-size* >

<world-readable | no-world-readable>;

flag *flag* ;

}

Hierarchy Level

[edit security flow]

Release Information

Statement introduced in Release 8.5 of JUNOS software.

Description

Configure flow tracing options.

This statement is supported on J-series and SRX-series devices.

3. Traceoptions (IKE)

Syntax

traceoptions {

file *filename* {

<files *number* >;

<match *regular-expression* >;

<size *maximum-file-size* >;

<world-readable | no-world-readable>;

}

flag *flag* ;

}

Hierarchy Level

[edit security ike]

4. Traceoptions (IPsec)

Syntax

traceoptions {

flag {

all;

next-hop-tunnel-binding;

packet-drops;

packet-processing;

security-associations;

}

}

Hierarchy Level

[edit security ipsec]

5. Traceoptions General

set system processes general-authentication-service traceoptions flag all i.e. for authd /var/log/authd
set security firewall-authentication traceoptions flag all i.e. for fwauthd /var/log/fwauthd

Table 1: IPsec Services Operational Mode Commands

Task	Command
Adaptive Services Interface	
Delete certificate authority (CA) digital certificates from the router.	clear security pki ca-certificate
Delete manually generated local digital certificate requests from the router.	clear security pki certificate-request
Delete all CRLs from the router.	clear security pki crl
Delete local digital certificates, certificate requests, and the corresponding public/private key pairs from the router.	clear security pki local-certificate
Delete local and remote certificates from the IPsec configuration memory cache.	clear services ipsec-vpn certificates
Clear IPsec statistics.	clear services ipsec-vpn ipsec statistics
Clear either Internet Key Exchange (IKE) or IPsec VPN security associations.	clear services ipsec-vpn ike security-associations clear services ipsec-vpn ipsec security-associations
Request a digital certificate from a CA online by using the Simple Certificate Enrollment Protocol (SCEP).	request security pki ca-certificate enroll
Manually load a CA digital certificate from a specified location.	request security pki ca-certificate load
Manually install a CRL on the router.	request security pki crl load
Manually generate a local digital certificate request in the Public-Key Cryptography Standards #10 (PKCS-10) format.	request security pki generate-certificate-request
Generate a Public Key Infrastructure (PKI) public and private key pair for a local digital certificate.	request security pki generate-key-pair
Request a CA to enroll and install a local digital certificate online by using the SCEP.	request security pki local-certificate enroll
Manually load a local digital certificate from a specified location.	request security pki local-certificate load
Switch between the primary and backup IPsec VPN tunnels.	request services ipsec-vpn ipsec switch tunnel
Display information about certificate authority (CA) digital certificates installed in the router.	show security pki ca-certificate
Display information about manually generated local digital certificate requests that are stored in the router.	show security pki certificate-request
Display information about the local digital certificates and the corresponding public keys installed in the router.	show security pki local-certificate
Display local and remote certificates installed in the IPsec configuration memory cache that are used for the IKE negotiation.	show services ipsec-vpn certificates
Display IKE VPN security associations for service sets.	show services ipsec-vpn ike security-associations

Task	Command
Display IPsec VPN security associations for service sets.	show services ipsec-vpn ipsec security-associations
Display IPsec VPN statistics for service sets.	show services ipsec-vpn ipsec statistics
Encryption Interface	
Clear Internet Key Exchange (IKE) security associations.	clear ike security-associations
Clear IPsec security associations.	clear ipsec security-associations
Switch between primary and backup interfaces and tunnels.	request ipsec switch
Obtain a public key certificate from a certification authority.	request security certificate (signed) request security certificate (unsigned)
Generate a public and private key pair.	request security key-pair
Add a certificate provided by the Juniper Networks certificate authority.	request system certificate add
Display IKE security association information.	show ike security-associations
Display the IPsec certificate database.	show ipsec certificates
Display primary and backup interface and tunnel information.	show ipsec redundancy
Display IPsec security association information.	show ipsec security-associations
Display installed certificates signed by the Juniper Networks certificate authority.	show system certificate

References

1. JUNOS Enhanced Services, Remote Access VPN with XAuth, Configuration and Troubleshooting Version 1.4, Richard Kim, Technical Support Engineer, Advanced JTAC
2. Configuring Dynamic VPN, Version 1.2, November 2009
3. *JUNOS® Software CLI Reference*
4. IP Security Operational Mode Commands, http://www.juniper.net/techpubs/en_US/junos10.4/topics/reference/general/ip-security-op-cmd-table.html
   Published: 2010-11-08