Contents

Introduction

This document describes how to configure a LAN-to-LAN VPN tunnel with the use of two Cisco Adaptive Security Appliance (ASA) Firewalls. The Cisco Adaptive Security Device Manager (ASDM) runs on the remote ASA through the outside interface on the public side, and it encrypts both regular network and ASDM traffic. The ASDM is a browser-based configuration tool that is designed in order to help you set up, configure, and monitor your ASA Firewall with a GUI. You do not need extensive knowledge of the ASA Firewall CLI.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- IPsec encryption
- Cisco ASDM

> **Note**: Ensure that all of the devices that are used in your topology meet the requirements that are described in the Cisco ASA 5500 Series Hardware Installation Guide.

> **Tip**: Refer to the An Introduction to IP Security (IPSec) Encryption Cisco article in order to gain familiarity with basic IPsec encryption.

Components Used

The information in this document is based on these software and hardware versions:

- Cisco ASA Firewall software Release 9.x.

- ASA-1 and ASA-2 are Cisco ASA Firewall 5520
- ASA 2 uses ASDM Version 7.2(1)

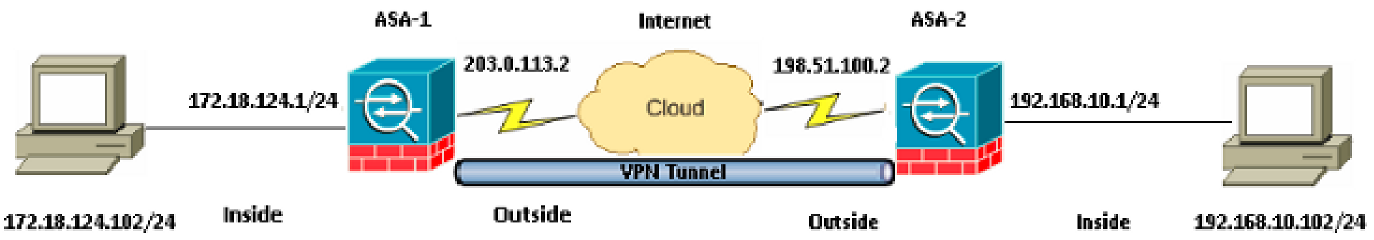
  Note: When you are prompted for a username and password for the ASDM, the default settings do not require a username. If an enable password was previously configured, enter that password as the ASDM password. If there is no enable password, leave both the username and password entries blank and click **OK** in order to continue.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Configure

Use the information that is described in this section in order to configure the features that are described in this document.

Network Diagram



Configurations

This is the configuration that is used on ASA-1:

ASA-1

```
ASA Version 9.1(5)
!
hostname ASA-1
!
interface GigabitEthernet0/0
nameif outside
security-level 0
ip address 203.0.113.2 255.255.255.0
!
interface GigabitEthernet0/1
nameif inside
security-level 100
ip address 172.18.124.1 255.255.255.0
!

!--- Traffic matching ACL 101 is punted to VPN
!--- Encrypt/Decrypt traffic matching ACL 101
```

```
access-list 101 extended permit ip 172.18.124.0 255.255.255.0 192.168.10.0
255.255.255.0

!--- Do not use NAT
!--- on traffic matching below Identity NAT

object network obj_192.168.10.0
subnet 192.168.10.0 255.255.255.0

object network obj_172.18.124.0
subnet 172.18.124.0 255.255.255.0

nat (inside,outside) source static obj_172.18.124.0 obj_172.18.124.0 destination
static obj_192.168.10.0 obj_192.168.10.0 no-proxy-arp route-lookup

!--- Configures a default route towards the gateway router.

route outside 0.0.0.0 0.0.0.0 203.0.113.252 1

!--- Point the configuration to the appropriate version of ASDM in flash

asdm image asdm-722.bin

!--- Enable the HTTP server required to run ASDM.

http server enable

!--- This is the interface name and IP address of the host or
!--- network that initiates the HTTP connection.

http 172.18.124.102 255.255.255.255 inside

!--- Implicitly permit any packet that came from an IPsec
!--- tunnel and bypass the checking of an associated access-group
!--- command statement for IPsec connections.

sysopt connection permit-vpn

!--- Specify IPsec (phase 2) transform set.
!--- Specify IPsec (phase 2) attributes.

crypto ipsec ikev1 transform-set vpn esp-3des esp-md5-hmac
crypto ipsec security-association pmtu-aging infinite
crypto map vpn 10 match address 101
crypto map vpn 10 set peer 198.51.100.2
crypto map vpn 10 set ikev1 transform-set vpn
crypto map vpn interface outside

!--- Specify ISAKMP (phase 1) attributes.

crypto ikev1 enable outside
crypto ikev1 policy 10
authentication pre-share
encryption 3des
hash sha
group 2
lifetime 86400

!--- Specify tunnel-group ipsec attributes.

tunnel-group 198.51.100.2 type ipsec-l2l
tunnel-group 198.51.100.2 ipsec-attributes
ikev1 pre-shared-key cisco
```

This is the configuration that is used on ASA-2:

ASA-2

```
ASA Version 9.1(5)
!
hostname ASA-2
!
interface GigabitEthernet0/0
nameif outside
security-level 0
ip address 198.51.100.2 255.255.255.0
!
interface GigabitEthernet0/1
nameif inside
security-level 100
ip address 192.168.10.1 255.255.255.0
!

!--- Traffic matching ACL 101 is punted to VPN
!--- Encrypt/Decrypt traffic matching ACL 101

access-list 101 extended permit ip 192.168.10.0 255.255.255.0 172.18.124.0
255.255.255.0

!--- Do not use NAT
!--- on traffic matching below Identity NAT

object network obj_192.168.10.0
subnet 192.168.10.0 255.255.255.0

object network obj_172.18.124.0
subnet 172.18.124.0 255.255.255.0

nat (inside,outside) source static obj_192.168.10.0 obj_192.168.10.0 destination
static obj_172.18.124.0 obj_172.18.124.0 no-proxy-arp route-lookup

!--- Configures a default route towards the gateway router.

route outside 0.0.0.0 0.0.0.0 198.51.100.252 1

!--- Point the configuration to the appropriate version of ASDM in flash

asdm image asdm-722.bin

!--- Enable the HTTP server required to run ASDM.

http server enable

!--- This is the interface name and IP address of the host or
!--- network that initiates the HTTP connection.

http 192.168.10.102 255.255.255.255 inside

!--- Add an aditional 'http' configuration to allow the remote subnet
!--- to access ASDM over the VPN tunnel

http 172.18.124.0 255.255.255.0 outside

!--- Implicitly permit any packet that came from an IPsec
!--- tunnel and bypass the checking of an associated access-group
!--- command statement for IPsec connections.
```

```
sysopt connection permit-vpn

!--- Specify IPsec (phase 2) transform set.
!--- Specify IPsec (phase 2) attributes.

crypto ipsec ikev1 transform-set vpn esp-3des esp-md5-hmac
crypto ipsec security-association pmtu-aging infinite
crypto map vpn 10 match address 101
crypto map vpn 10 set peer 203.0.113.2
crypto map vpn 10 set ikev1 transform-set vpn
crypto map vpn interface outside

!--- Specify ISAKMP (phase 1) attributes.

crypto ikev1 enable outside
crypto ikev1 policy 10
authentication pre-share
encryption 3des
hash sha
group 2
lifetime 86400

!--- Specify tunnel-group ipsec attributes.

tunnel-group 203.0.113.2 type ipsec-l2l
tunnel-group 203.0.113.2 ipsec-attributes
ikev1 pre-shared-key cisco
```

Access ASDM/SSH Across a VPN Tunnel

In order to access ASDM via the inside interface of ASA-2 from the ASA-1 inside network, you must use the command that is described here. This command can only be used for one interface. On ASA-2, configure *management-access* with the **management-access inside** command:

```
management-access <interface-name>
```

Verify

This section provides information that you can use in order to verify that your configuration works properly.

> **Note**: The Cisco CLI Analyzer (registered customers only) supports certain **show** commands. Use the Cisco CLI Analyzer in order to view an analysis of **show** command output.

Use these commands in order to verify your configuration:

- Enter the **show crypto isakmp sa/show isakmp sa** command in order to verify that Phase 1 establishes correctly.
- Enter the **show crypto ipsec sa** in order to verify that Phase 2 establishes correctly.

Command Summary

Once the VPN commands are entered into the ASAs, a VPN tunnel is established when traffic passes between the ASDM PC (172.18.124.102) and the inside interface of ASA-2 (192.168.10.1). At this point, the ASDM PC is able to reach https://192.168.10.1 and communicate with the ASDM interface of ASA-2 over the VPN tunnel.

Troubleshoot

This section provides information that you can use in order to troubleshoot your configuration.

> **Note**: Refer to the ASA Connection Problems to the Cisco Adaptive Security Device Manager Cisco article in order to troubleshoot ASDM-related issues.

Sample Debug Output

Enter the **show crypto isakmp sa** command in order to view the tunnel that is formed between 198.51.100.2 and 203.0.113.2:

```
ASA-2(config)# show crypto isakmp sa

IKEv1 SAs:

  Active SA: 1
   Rekey SA: 0 (A tunnel will report 1 Active and 1 Rekey SA during rekey)
Total IKE SA: 1

1   IKE Peer: 203.0.113.2
   Type    : L2L             Role    : initiator
   Rekey   : no              State   : MM_ACTIVE
```

Enter the **show crypto ipsec sa** command in order to view the tunnel that passes traffic between 192.168.10.0 255.255.255.0 and 172. 18.124.0 255.255.255.0:

```
ASA-2(config)# show crypto ipsec sa
interface: outside
Crypto map tag: vpn, seq num: 10, local addr: 198.51.100.2

access-list 101 extended permit ip 192.168.10.0 255.255.255.0
172.18.124.0 255.255.255.0
local ident (addr/mask/prot/port): (192.168.10.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (172.18.124.0/255.255.255.0/0/0)
current_peer: 203.0.113.2

#pkts encaps: 5, #pkts encrypt: 5, #pkts digest: 5
#pkts decaps: 5, #pkts decrypt: 5, #pkts verify: 5
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 5, #pkts comp failed: 0, #pkts decomp failed: 0
#pre-frag successes: 0, #pre-frag failures: 0, #fragments created: 0
#PMTUs sent: 0, #PMTUs rcvd: 0, #decapsulated frgs needing reassembly: 0
#TFC rcvd: 0, #TFC sent: 0
#Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
#send errors: 0, #recv errors: 0

local crypto endpt.: 198.51.100.2/0, remote crypto endpt.: 203.0.113.2/0
path mtu 1500, ipsec overhead 58(36), media mtu 1500
PMTU time remaining (sec): 0, DF policy: copy-df
ICMP error validation: disabled, TFC packets: disabled
current outbound spi: DDE6AD22
current inbound spi : 92425FE5

inbound esp sas:
spi: 0x92425FE5 (2453823461)
```

```
transform: esp-3des esp-md5-hmac no compression
in use settings ={L2L, Tunnel, IKEv1, }
slot: 0, conn_id: 28672, crypto-map: vpn
sa timing: remaining key lifetime (kB/sec): (4373999/28658)
IV size: 8 bytes
replay detection support: Y
Anti replay bitmap:
0x00000000 0x0000003F
outbound esp sas:
spi: 0xDDE6AD22 (3722882338)
transform: esp-3des esp-md5-hmac no compression
in use settings ={L2L, Tunnel, IKEv1, }
slot: 0, conn_id: 28672, crypto-map: vpn
sa timing: remaining key lifetime (kB/sec): (4373999/28658)
IV size: 8 bytes
replay detection support: Y
Anti replay bitmap:
0x00000000 0x00000001
```

Related Information

- **Cisco ASA Command Reference**
- **Technical Support & Documentation - Cisco Systems**