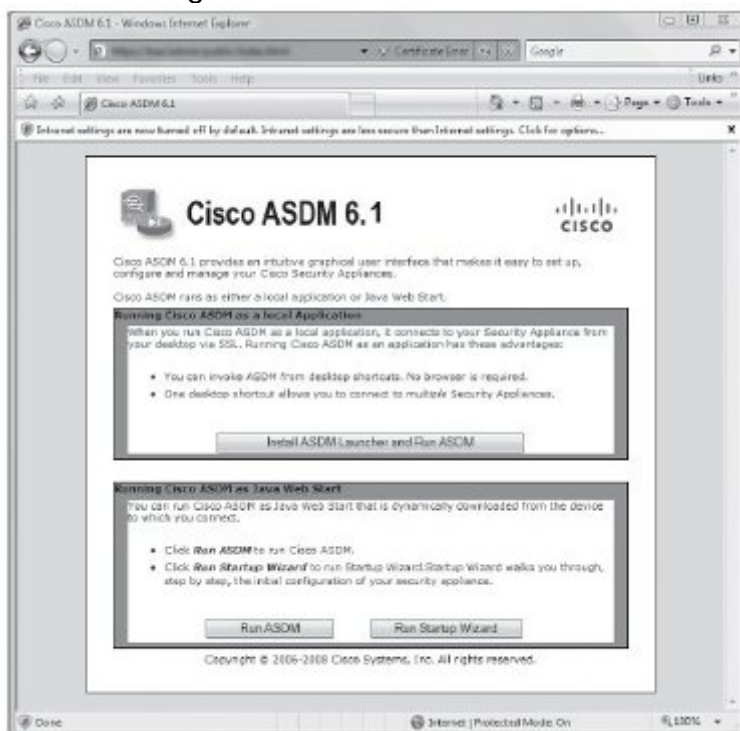


SSL VPN Configuration of a Cisco ASA 8.0

SSL VPN Configuration of a Cisco ASA 8.0

The Cisco® ASA family of devices are based on the Cisco® PIX platform (Figure 19); however they have been re-engineered and improved with feature rich functions. Included in the ASA Platform is IPsec VPN, SSL VPN, Web Portal and Secure Desktop facilities. The IPsec VPN functions are included for no extra charge; the remainder are chargeable options after version 7.0 of the ASA.

Configuration of the Cisco ASA can be either through the CLI (command line interface) using SSH or through the ASDM GUI interface. The ASDM client software for Windows and Mac OS may be downloaded and installed by all features of the ASA are supported



[1]

Figure 20. Cisco ASDM download and installation.

The CLI interface can be reached through the SSH protocol, typically using PuTTY under Windows (Figure 21) or SSH/Slogin on Unix/Linux Operating Systems.

```

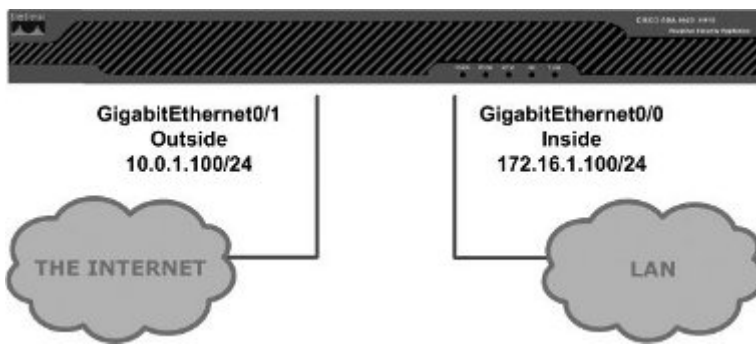
login as:
Type help or '?' for a list of available commands.
asa> enable
Password: *****
asa# sh run
: Saved
:
ASA Version 8.0(4)
!
hostname asa
domain-name lab01.ac.uk
enable password encrypted
password encrypted encrypted
name
name
name
name
name
name
name
name
dos-guard
!
interface GigabitEthernet0/0
 description inside
 nameif inside

```

[2]

Figure 21. Cisco ASA access through the CLI using PuTTY.

Configuration Example



ages and functions.

[3]

The following configuration example configures the Cisco ASA for IPSec and SSL VPN connectivity, and provides pointers to areas mentioned in the SSL VPN chapter.

1. Configure the interfaces on the ASA for connectivity on the organisational LAN. Security levels should be configured so the inside interface is a higher value than the outside. Add default routes:

```

interface GigabitEthernet0/0

description inside

nameif inside

security-level 100

ip address 172.16.1.100 255.255.255.0

!

route inside 172.16.0.0 255.255.0.0 172.16.1.1.1

```

```
route inside 192.168.1.0 255.255.255.0 172.16.1.1.1
```

2. Clear the ASA flash and upload new firmware images:

```
show flash:
```

```
erase flash:
```

```
copy tftp://<tftp Server>/asa803-6-k8.bin flash:
```

```
copy tftp://<tftp Server>/asdm-611.bin flash:
```

3. Configure the new images as the default boot images:

```
boot system disk0:/asa803-6-k8.bin
```

```
asdm image disk0:/asdm-611.bin
```

```
wr mem
```

```
reload
```

4. Configure the ASA with appropriate passwords:

```
enable password -password-
```

```
passwd -password-
```

5. Enable SSH on the inside interface:

```
crypto key generate rsa modulus 1024
```

```
ssh 172.16.0.0 255.255.0.0 inside
```

```
ssh 172.16.1.0 255.255.255.0 management
```

```
ssh timeout 5
```

```
ssh version 2
```

```
Check with ssh <IP Address> -l pix
```

6. Configure other Interfaces and Routing:

```
interface GigabitEthernet0/1
```

```
description outside
```

```
no shutdown
```

```
nameif outsidesecurity-level 0
```

```
ip address 10.0.1.100 255.255.255.0
```

```
!
```

```
interface GigabitEthernet0/2
```

```
shutdown
```

```
no nameif
```

```
no security-level
```

```
no ip address
```

```
!
```

```
interface GigabitEthernet0/3
```

```
shutdown
```

```
no nameif
```

```
no security-level
```

```
no ip address
```

```
!
```

```
interface Management0/0
```

```
description management
```

```
no shutdown
```

```
nameif management
```

```
security-level 100
```

```
ip address 172.16.1.0 255.255.255.0
```

```
management-only
```

```
!
```

```
route outside 0.0.0.0 0.0.0.0 10.0.1.1.1
```

7. Configure DNS:

```
dns domain-lookup inside
```

```
dns server-group DefaultDNS
```

```
name-server <Primary DNS IP Address>
name-server <Secondary DNS IP Address>
name-server <Tertiary DNS IP Address>
domain-name camford.ac.uk
names
name <IP Address> <Static FQDN>
etc...
dns-guard
```

8. The ASA can categorise entities into object groups. Adding hostnames for entries within the configuration can make administration easier; in this example entries for Microsoft SMS Server are added:

```
object-group service MSRDP tcp
port-object eq 3389
object-group network SMS_Servers
network-object host sms-server1
network-object host sms-server2
network-object host sms-database
```

9. Create the Access Lists to support the security of the VPN/Firewall within the ACL:

```
access-list CAMFORD-NETBLOCKS-v1 standard permit 172.16.0.0 255.255.0.0
access-list CAMFORD-NETBLOCKS-v1 standard permit 192.168.1.0 255.255.255.0
access-list CAMFORD-NETBLOCKS-v1 standard deny any
access-list ANY-TO-ANY extended permit ip any any log critical
access-list CAMFORD-CENTRAL-SERVICES-v1 extended permit ip any 172.16.1.0
255.255.255.0
access-list CAMFORD-CENTRAL-SERVICES-v1 extended permit ip any 172.16.16.0
255.255.255.0
access-list CAMFORD-CENTRAL-SERVICES-v1 extended permit tcp any any eq ssh log
alerts
access-list CAMFORD-CENTRAL-SERVICES-v1 extended permit tcp any any object-
```

group MSRDP log alerts

access-list inside_nat0_outbound extended permit ip any 172.16.154.0 255.255.254.0 log critical

access-list Split_Tunnel_List remark allow only our traffic

access-list Split_Tunnel_List standard permit 172.16.0.0 255.255.0.0

access-list Split_Tunnel_List standard permit 192.168.1.0 255.255.255.0

access-list CAMFORD_splitTunnelAcl standard permit 172.16.0.0 255.255.0.0

access-list CAMFORD_splitTunnelAcl standard permit 192.168.1.0 255.255.255.0

access-list CAMFORD-NOSMS extended deny tcp any object-group SMS_Servers eq www log alerts

access-list CAMFORD-NOSMS extended deny tcp any object-group SMS_Servers eq https log alerts

10. Configure the logging options:

logging enable

logging timestamp

logging console critical

logging buffered warnings

logging trap informational

logging asdm informational

logging facility 16

logging device-id hostname

logging host inside <IP Address of SYSLOG Server>

11. Configure MTU size and ICMP:

mtu inside 1500

mtu outside 1500

mtu management 1500

icmp unreachable rate-limit 1 burst-size 1

icmp permit 172.16.0.0 255.255.0.0 inside

```
icmp permit 192.168.1.0 255.255.255.0 inside
```

```
icmp permit 10.0.1.0 255.255.255.0 outside
```

12. Configure IP Address Local Pool and NAT:

```
ip local pool CAMFORD-LOCAL-POOL-v1 172.16.150.20-172.16.151.253 mask  
255.255.254.0
```

```
nat (inside) 0 access-list inside_nat0_outbound
```

```
nat (inside) 0 0.0.0.0 0.0.0.0
```

```
static (inside,outside) 0.0.0.0 0.0.0.0 netmask 0.0.0.0
```

13. Configure the ASA Timeout values:

```
timeout xlate 3:00:00
```

```
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00 icmp 0:00:02
```

```
timeout sunrpc 0:10:00 h323 0:05:00 h225 1:00:00 mgcp 0:05:00 mgcp-pat 0:05:00
```

```
timeout sip 0:30:00 sip_media 0:02:00 sip-invite 0:03:00 sip-disconnect 0:02:00
```

```
timeout uauth 0:05:00 absolute
```

14. Configure LDAP Attribute Map, to map LDAP attributes to meaningful names:

```
ldap attribute-map AD-Group-Mapping
```

```
map-name memberOf IETF-Radius-Class
```

```
map-value memberOf CN=maths,OU=groups,OU=SCIENCE,DC=camford,DC=ac,DC=uk  
mathsstaff
```

15. Configure Dynamic Access Policies to be applied depending on LDAP attributes:

```
dynamic-access-policy-record DfltAccessPolicy
```

```
network-acl CAMFORD-CENTRAL-SERVICES-v1
```

```
network-acl CAMFORD-NOSMS
```

```
dynamic-access-policy-record CAMFORD-DAP-MATHSSTAFF-v1
```

```
network-acl CAMFORD-MATHSSTAFF-v1
```

```
network-acl CAMFORD-CENTRAL-SERVICES-v1
```

```
network-acl CAMFORD-NOSMS
```

16. Enable WebServer:

http server enable

http 0.0.0.0 0.0.0.0 outside

http 172.16.0.0 255.255.0.0 inside

http 172.16.1.0 255.255.255.0 management

http redirect outside 80

http redirect inside 80

17. Configure SNMP:

snmp-server host inside <SNMP Monitoring IP> community public version 2c

snmp-server host inside <SNMP Monitoring IP> community public version 2c
snmp-server location <LOCATION>

snmp-server contact <EMAIL>

snmp-server community <COMMUNITY>

snmp-server enable traps snmp authentication linkup linkdown coldstart

18. Crypto Map configuration is entirely dependent on the cryptography features required. The cryptomap command in the Cisco ASA allows the configuration of the cryptography features outlined in section 5.5.4 with specific reference to FIPS 140-2 Compliance.

19. IDS: Configure the basic, built-in IDS code:

threat-detection basic-threat

threat-detection statistics

20. NTP:

ntp server <IP of Server1> source inside prefer

ntp server <IP of Server2> source inside

21. WebVPN Configuration can be implemented in as little as eight stages. Section 8.2 explores web-based portals in more detail:

webvpn

enable outside

http-proxy <Web Proxy IP> 3128

https-proxy <Web Proxy IP> 3128

svc enable

smart-tunnel list "RDP_SSH" "PuTTY" "putty.exe"

smart-tunnel list "RDP_SSH" "MSRDP" "mstsc.exe"

22. Configure the default VPN Group Policy:

group-policy DfltGrpPolicy attributes

downtime messages etc. NOT the AUP!

wins-server value <WINS IP – If Required>

dns-server value <DNS Server1> <DNS Server2>

vpn-tunnel-protocol IPSec l2tp-ipsec svc webvpn

password-storage enable

ip-comp enable

re-xauth enable

pfs enable

ipsec-udp enable

split-tunnel-policy tunnelspecified

split-tunnel-network-list value Split_Tunnel_List

default-domain value camford.ac.uk

secure-unit-authentication enable

user-authentication enable

user-authentication-idle-timeout none

backup-servers clear-client-config

address-pools value CAMFORD-LOCAL-POOL-v1

webvpn

url-list value Camford

smart-tunnel enable RDP_SSH

file-entry disable

file-browsing disable

23. Configure the VPN Tunnel Groups:

tunnel-group DefaultRAGroup general-attributes

address-pool CAMFORD-LOCAL-POOL-v1

authentication-server-group CAMFORD-AD-v1

strip-realm

tunnel-group DefaultRAGroup webvpn-attributes

nbns-server <WINS Server> timeout 2 retry 2

nbns-server <WINS Server2> timeout 2 retry 2

tunnel-group DefaultRAGroup ipsec-attributes

pre-shared-key <SHARED SECRET>

tunnel-group DefaultWEBVPNGroup general-attributes

address-pool CAMFORD-LOCAL-POOL-v1

authentication-server-group CAMFORD-AD-v1

strip-realm

tunnel-group DefaultWEBVPNGroup webvpn-attributescustomization CAMFORD-HOMEPAGEv1

nbns-server <WINS Server> timeout 2 retry 2

nbns-server <WINS Server2> timeout 2 retry 2

group-alias Default enable

tunnel-group DefaultWEBVPNGroup ipsec-attributes

pre-shared-key <SHARED SECRET>

address-pool CAMFORD-POOL-v1

authentication-server-group CAMFORD-AD-v1

strip-realm

tunnel-group CAMFORD type remote-access

```
tunnel-group CAMFORD general-attributes
address-pool CAMFORD-LOCAL-POOL-v1
authentication-server-group CAMFORD-AD-v1
default-group-policy CAMFORD
tunnel-group CAMFORD ipsec-attributes
pre-shared-key <SHARED SECRET>
```

24. Configure a default Class Map for inspection:

```
class-map inspection_default
match default-inspection-traffic
```

25. Configure an inspection Policy Map:

```
policy-map type inspect dns preset_dns_map
parameters
message-length maximum 512
policy-map global_policy
class inspection_default
inspect dns preset_dns_map
inspect ftp
inspect h323 h225
inspect h323 ras
inspect netbios
inspect rsh
inspect rtsp
inspect skinny
inspect esmtp
inspect sqlnet
inspect sunrpc
```

inspect tftp

inspect sip

inspect xdmcp

policy-map type inspect dns migrated_dns_map_1

parameters

message-length maximum 512

26. Configure TACAS+ and default usernames if required:

aaa-server CAMFORD-TACACS-v1 protocol tacacs+

reactivation-mode timed

max-failed-attempts 5

aaa-server CAMFORD-TACACS-v1 host <TACACS SERVER1>

key <SHARED SECRET>

aaa-server CAMFORD-TACACS-v1 host <TACACS SERVER2>

key <SHARED SECRET>

aaa authentication enable console CAMFORD-TACACS-v1 LOCAL

aaa authentication http console CAMFORD-TACACS-v1 LOCAL

aaa authentication ssh console CAMFORD-TACACS-v1 LOCAL

aaa authentication serial console CAMFORD-TACACS-v1 LOCAL

aaa accounting enable console CAMFORD-TACACS-v1

aaa accounting serial console CAMFORD-TACACS-v1

aaa accounting ssh console CAMFORD-TACACS-v1

aaa accounting command CAMFORD-TACACS-v1

aaa authorization exec authentication-server

aaa authorization command CAMFORD-TACACS-v1 LOCAL

To verify that the device is in communication with the AAA server use the following command:

show aaa-server

27. Configure Active Directory LDAP authentication:aaa-server CAMFORD-AD-v1 protocol ldap

aaa-server CAMFORD-AD-v1 host <Domain Controller 1>

ldap-base-dn DC=camford,DC=ac,DC=uk

ldap-scope subtree

ldap-naming-attribute sAMAccountName

ldap-login-password <PASSWORD>

ldap-login-dn <Role Based AD Account>

server-type microsoft

ldap-attribute-map AD-Group-Mapping

aaa-server CAMFORD-AD-v1 host <Domain Controller 2>

ldap-base-dn DC=camford,DC=ac,DC=uk

ldap-scope subtree

ldap-naming-attribute sAMAccountName

ldap-login-password <PASSWORD>

ldap-login-dn <Role Based AD Account>

server-type microsoft

ldap-attribute-map AD-Group-Mapping

aaa-server CAMFORD-AD-v1 host <Domain Controller 3>

ldap-base-dn DC=camford,DC=ac,DC=uk

ldap-scope subtree

ldap-naming-attribute sAMAccountName

ldap-login-password <PASSWORD>

ldap-login-dn <Role Based AD Account>

server-type microsoft

ldap-attribute-map AD-Group-Mapping

28. The Cisco ASA requires an SSL VPN license to allow more than two SSL VPN sessions:

1. Go to: <http://www.cisco.com/go/license> [4]
2. Enter the SSL VPN Product Authorisation Key (PAK) found on the License Claim Certificate.
3. Select [All Done]
4. Enter Serial Number from a 'sh ver | include Number' [Submit]
5. [Submit]
6. Once Registration is complete, await email confirmation.
7. `ciscoasa(config)# activation-key [key from email]`

29. Once the VPN has been configured the Network Connect AnyConnect Images need to be uploaded:

1. Start the ASDM and connect to the ASA
2. Configuration -> Remote Access VPN -> Network (Client) Access -> AnyConnect Connection Profiles
3. Select Access Interfaces: Enable Cisco AnyConnect VPN Client
4. Upload an AnyConnect Image
5. Configuration -> Remote Access VPN -> Network (Client) Access -> Advanced -> SSL VPN -> Client Settings
6. Click +Add
7. `anyconnect-win-2.3.0185-k9.pkg`
8. `anyconnect-macosx-i386-2.3.0185-k9.pkg`
9. `anyconnect-macosx-powerpc-2.3.185-k9.pkg`
10. `anyconnect-linux-2.3.185-k9.pkg`

30. The ASA can have a number of Client-Server Plugins for the Web-based VPN portal:

1. Start the ASDM and connect to the ASA
2. Configuration -> Remote Access VPN -> Clientless SSL VPN Access -> Portal -> Client-Server Plug-ins
3. Click +Import
4. Plug-in Name: RDP

5. Remote Server tftp://<SERVER>/ASA/ASAPlugin/rdp-plugin.080130.jar
 6. Click +Import
 7. Plug-in Name: SSH,Telnet
 8. Remote Server tftp://<SERVER>/ASA/ASAPlugin/ssh-plugin.jar
 9. Click +Import
 10. Plug-in Name: SSH,Telnet
 11. Remote Server tftp://<SERVER>/ASA/ASAPlugin/vnc-plugin.080130.jar
28. Finally Miscellaneous configuration: pager lines 24
- ```
ftp mode passive
arp timeout 14400
no failover
no vpn-addr-assign aaa
no vpn-addr-assign dhcp
telnet timeout 5
console timeout 0
l2tp tunnel hello 30
service-policy global_policy global
prompt hostname context
no asdm history enable
```

## Further Documentation

Cisco provides more detailed documentation at the following locations:

- Command Line Configuration Guide (v8.0):  
<http://www.cisco.com/en/US/docs/security/asa/asa80/configuration/guide/asa80cfg.pdf> [5]
- ASDM User Guide (v6.0):  
<http://www.cisco.com/en/US/docs/security/asa/asa80/asdm60/user/guide/asdmug.pdf> [6]
- SSL VPN Certificates:  
[http://www.cisco.com/warp/public/471/asa\\_8.x\\_3rdpartyvendorcert.pdf](http://www.cisco.com/warp/public/471/asa_8.x_3rdpartyvendorcert.pdf) [7]

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**Source URL:** <https://community.jisc.ac.uk/library/advisory-services/ssl-vpn-configuration-cisco-asa-80>

## Links

[1] <http://community.ja.net/system/files/images/tg-vpn-20.jpg>

- [2] <http://community.ja.net/system/files/images/tg-vpn-21.jpg>
- [3] <http://community.ja.net/system/files/images/tg-vpn-22.jpg>
- [4] <http://www.cisco.com/go/license>
- [5] <http://www.cisco.com/en/US/docs/security/asa/asa80/configuration/guide/asa80cfg.pdf>
- [6] <http://www.cisco.com/en/US/docs/security/asa/asa80/asdm60/user/guide/asdmug.pdf>
- [7] [http://www.cisco.com/warp/public/471/asa\\_8.x\\_3rdpartyvendorcert.pdf](http://www.cisco.com/warp/public/471/asa_8.x_3rdpartyvendorcert.pdf)