Пример настройки средства Easy VPN в PIX/ASA 7.x с помощью модуля ASA 5500 в качестве сервера и PIX 506E в качестве клиента (NEM)

Содержание

Введение

В этом документе приводится пример настройки протокола IPsec между устройством адаптивной защиты Cisco (Adaptive Security Appliance) ASA 5520 и Cisco PIX 506E с помощью EasyVPN. ASA 5520 служит в качестве сервера EasyVPN, а PIX 506E – удаленного клиента EasyVPN. Хотя в этой конфигурации используется устройство ASA 5520 с программным обеспечением ASA версии 7.0(4), эту конфигурацию также можно применять для межсетевых экранов PIX с операционной системой PIX версии 7.0 и более поздними.

Описание аналогичного сценария, в котором маршрутизатор Cisco 871 играет роль удаленной стороны Easy VPN, см. в документе Пример настройки Easy VPN с PIX/ASA 7.x с ASA 5500 в качестве сервера и Cisco 871 в качестве удаленной стороны Easy VPN.

Описание аналогичного сценария, в котором концентратор Cisco VPN 3000 служит в качестве сервера Easy VPN, см. в документе Пример настройки аппаратного клиента VPN на модуле защиты PIX серии 501/506 с концентратором VPN 3000.

Дополнительные сведения об аналогичном сценарии, где маршрутизатор Cisco IOS служит в качестве сервера Easy VPN, см. в документе Пример настройки Easy VPN Remote PIX 501/506 с маршрутизатором IOS® в режиме расширения сети (NEM) с расширенной аутентификацией.

Описание аналогичного сценария, в котором PIX 506 6.x служит в качестве сервера Easy VPN, см. в документе PIX – PIX 6.x: Пример настройки Easy VPN (NEM).

Предварительные условия

Требования

Убедитесь, что вы обеспечили выполнение следующих требований, прежде чем попробовать эту конфигурацию:

- Необходимо иметь общее представление о протоколе IPsec и операционных системах ASA/PIX 6.x и 7.x.

Используемые компоненты

Сведения, содержащиеся в данном документе, касаются следующих версий программного обеспечения и оборудования:

- Вынесенный аппаратный клиент EasyVPN - это PIX 506E с версией 6.3(5).
- Сервер EasyVPN - это ASA 5520 с версией 7.0(4).

Примечание: Версия 7.x серии 5500 ASA выполняет то же программное обеспечение, замеченное в Версии PIX 7. x. Настройки, приведенные в этом документе, применимы к обеим линиям продуктов.

Сведения, представленные в этом документе, были получены от устройств, работающих в специальной лабораторной среде. Все устройства, описанные в этом документе, были запущены с чистой (стандартной) конфигурацией. В рабочей сети необходимо изучить потенциальное воздействие всех команд до их использования.

Условные обозначения

Более подробную информацию о применяемых в документе обозначениях см. в описании условных обозначений, используемых в технической документации Cisco.

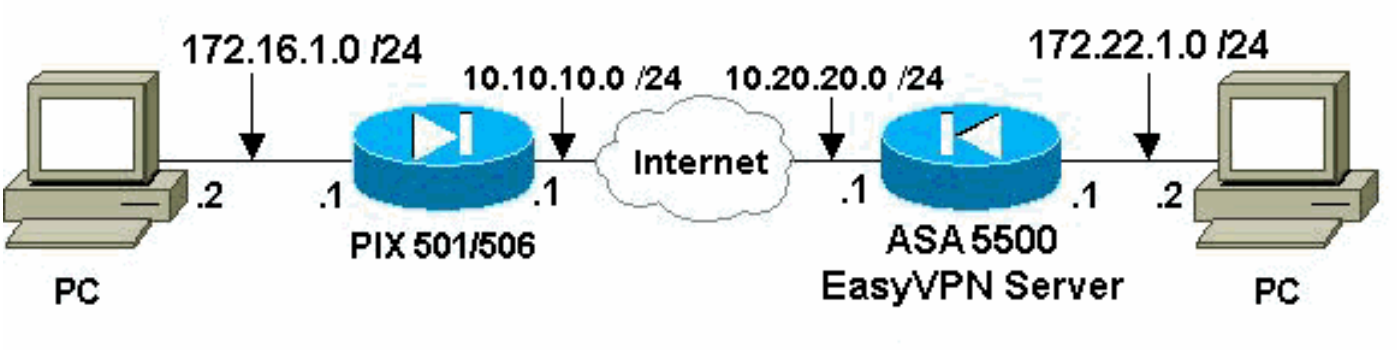
Настройка

В этом разделе содержатся сведения о настройке функций, описанных в этом документе.

Примечание: Используйте инструмент Command Lookup (только для зарегистрированных пользователей) для того, чтобы получить более подробную информацию о командах, использованных в этом разделе.

Схема сети

В настоящем документе используется следующая схема сети:



Конфигурации

Эти конфигурации используются в данном документе:

- Сервер Easy VPN (ASA 5520)
- Вынесенный аппаратный клиент Easy VPN

Сервер Easy VPN (ASA 5520)

```
ASA5520-704#write terminal : Saved : ASA Version 7.0(4)
! hostname ASA5520-704 enable password 8Ry2YjIyt7RRXU24
encrypted names ! !--- Configure the outside and inside
interfaces. interface GigabitEthernet0/0 nameif outside
security-level 0 ip address 10.20.20.1 255.255.255.0 !
interface GigabitEthernet0/1 nameif inside security-
level 100 ip address 172.22.1.1 255.255.255.0 !
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 shutdown no
nameif no security-level no ip address ! passwd
2KFQnbNIdI.2KYOU encrypted ftp mode passive !--- This
access list is used for a nat zero command that prevents
!--- traffic which matches the access list from
undergoing !--- network address translation (NAT).
access-list no-nat extended permit ip 172.22.1.0
255.255.255.0 172.16.1.0 255.255.255.0 !--- This access
list is used to define the traffic !--- that should pass
through the tunnel. !--- It is bound to the group policy
which defines !--- a dynamic crypto map. access-list
ezvpn1 extended permit ip 172.22.1.0 255.255.255.0
172.16.1.0 255.255.255.0 pager lines 24 mtu outside 1500
mtu inside 1500 no failover icmp permit any echo-reply
outside icmp permit any inside no asdm history enable
arp timeout 14400 !--- Specify the NAT configuration. !-
-- NAT 0 prevents NAT for the ACL defined in this
configuration. !--- The nat 1 command specifies NAT for
all other traffic. global (outside) 1 interface nat
(inside) 0 access-list no-nat nat (inside) 1 0.0.0.0
0.0.0.0 route outside 0.0.0.0 0.0.0.0 10.20.20.2 1
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 timeout mgcp-pat
0:05:00 sip 0:30:00 sip_media 0:02:00 timeout uauth
0:05:00 absolute !--- This defines the group policy you
use with EasyVPN. !--- Specify the networks !--- that
should pass through the tunnel and that you want to !---
```

```
use network extension mode. group-policy myGROUP
internal group-policy myGROUP attributes split-tunnel-
policy tunnelspecified split-tunnel-network-list value
ezvpn1 nem enable webvpn !--- Here the username and
password associated with !--- this VPN connection are
defined. You !--- can also use AAA for this function.
username cisco password 3USUcOPFUiMCO4Jk encrypted no
snmp-server location no snmp-server contact snmp-server
enable traps snmp authentication linkup linkdown
coldstart !--- PHASE 2 CONFIGURATION ---! !--- The
encryption types for Phase 2 are defined here. !--- A
single DES encryption with !--- the md5 hash algorithm
is used. crypto ipsec transform-set mySET esp-des esp-
md5-hmac !--- Defines a dynamic crypto map with !--- the
specified encryption settings. crypto dynamic-map myDYN-
MAP 5 set transform-set mySET !--- Binds the dynamic map
to the IPsec/ISAKMP process. crypto map myMAP 60 ipsec-
isakmp dynamic myDYN-MAP !--- Specifies the interface to
be used with !--- the settings defined in this
configuration. crypto map myMAP interface outside !---
PHASE 1 CONFIGURATION ---! !--- This configuration uses
isakmp policy 1. !--- Policy 65535 is included in the
default !--- configuration. The configuration commands
here define the Phase !--- 1 policies that are used.
isakmp enable outside isakmp policy 1 authentication
pre-share isakmp policy 1 encryption des isakmp policy 1
hash md5 isakmp policy 1 group 2 isakmp policy 1
lifetime 86400 isakmp policy 65535 authentication pre-
share isakmp policy 65535 encryption 3des isakmp policy
65535 hash sha isakmp policy 65535 group 2 isakmp policy
65535 lifetime 86400 !--- The tunnel-group commands bind
the configurations !--- defined in this configuration to
the tunnel that is !--- used for EasyVPN. This tunnel
name is the one specified on the remote side. tunnel-
group mytunnel type ipsec-ra tunnel-group mytunnel
general-attributes default-group-policy myGROUP tunnel-
group mytunnel ipsec-attributes !--- The pre-shared-key
used here is "cisco". pre-shared-key * telnet timeout 5
ssh timeout 5 console timeout 0 ! class-map
inspection_default match default-inspection-traffic ! !
policy-map global_policy class inspection_default
inspect dns maximum-length 512 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 !
service-policy global_policy global
Cryptochecksum:42123a94a33d8d10ae6a1505fb4ba653 : end
[OK] ASA5520-704#
```

Вынесенный аппаратный клиент Easy VPN

```
pix506-635#write terminal Building configuration... :
Saved : PIX Version 6.3(5) !--- Brings the interfaces
out of a shutdown state. interface ethernet0 auto
interface ethernet1 auto !--- Assign the interface
names. nameif ethernet0 outside security0 nameif
ethernet1 inside security100 enable password
8Ry2YjIyt7RRXU24 encrypted passwd 2KFQnbNIdI.2KYOU
encrypted hostname pix506-635 domain-name cisco.com
fixup protocol dns maximum-length 512 fixup protocol ftp
21 fixup protocol h323 h225 1720 fixup protocol h323 ras
1718-1719 fixup protocol http 80 fixup protocol rsh 514
fixup protocol rtsp 554 fixup protocol sip 5060 fixup
protocol sip udp 5060 fixup protocol skinny 2000 fixup
protocol smtp 25 fixup protocol sqlnet 1521 fixup
```

```
protocol tftp 69 names pager lines 24 icmp permit any
outside mtu outside 1500 mtu inside 1500 !--- Assign the
interface IP addresses. ip address outside 10.10.10.1
255.255.255.0 ip address inside 172.16.1.1 255.255.255.0
ip audit info action alarm ip audit attack action alarm
pdm history enable arp timeout 14400 !--- Set the
standard NAT configuration. !--- EasyVPN provides the
NAT exceptions needed. global (outside) 1 interface nat
(inside) 1 0.0.0.0 0.0.0.0 0 0 !--- Specify the default
route. route outside 0.0.0.0 0.0.0.0 10.10.10.2 1
timeout xlate 3:00:00 timeout conn 1:00:00 half-closed
0:10:00 udp 0:02:00 rpc 0:10:00 h225 1:00:00 timeout
h323 0:05:00 mgcp 0:05:00 sip 0:30:00 sip_media 0:02:00
timeout sip-disconnect 0:02:00 sip-invite 0:03:00
timeout uauth 0:05:00 absolute aaa-server TACACS+
protocol tacacs+ aaa-server TACACS+ max-failed-attempts
3 aaa-server TACACS+ deadtime 10 aaa-server RADIUS
protocol radius aaa-server RADIUS max-failed-attempts 3
aaa-server RADIUS deadtime 10 aaa-server LOCAL protocol
local no snmp-server location no snmp-server contact
snmp-server community public no snmp-server enable traps
floodguard enable telnet timeout 5 ssh timeout 5 console
timeout 0 !--- EasyVPN Client Configuration ---! !---
Specify the IP address of the VPN server. vpnclient
server 10.20.20.1 !--- This example uses network
extension mode. vpnclient mode network-extension-mode !-
-- Specify the group name and the pre-shared key.
vpnclient vpngroup mytunnel password ******** !---
Specify the authentication username and password.
vpnclient username cisco password ******** !---- After
you issue this command, the tunnel is established.
vpnclient enable terminal width 80
Cryptochecksum:1564fd62a9e4312020f51846bd1b3534 : end
[OK] pix506-635#
```

Проверка

Этот раздел позволяет убедиться, что конфигурация работает правильно.

Средство Output Interpreter (OIT) (только для зарегистрированных клиентов) поддерживает определенные команды show. **Посредством OIT можно анализировать выходные данные команд show.**

- Команды show для сервера PIX EasyVPN и пример выходных данных
- Команды show для вынесенного аппаратного клиента PIX EasyVPN и пример выходных данных

Команды show для сервера PIX EasyVPN и пример выходных данных

- **команда show crypto isakmp sa выводит все текущие сопоставления безопасности (security associations, SA) протокола IKE (Internet Key Exchange, обмен ключами в Интернете) на одноранговом узле.**`ASA5520-704#`**`show crypto isakmp sa`** `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: 10.10.10.1 Type : user Role : responder Rekey : no State : AM_ACTIVE ASA5520-704#`
- **show crypto ipsec sa - Отображает сопоставление IPSec SA, построенное между узлами.**`ASA5520-704#`**`show crypto ipsec sa`** `interface: outside Crypto map tag: myDYN-MAP, seq num: 5, local addr: 10.20.20.1 local ident (addr/mask/prot/port):`

```
(172.22.1.0/255.255.255.0/0/0) remote ident (addr/mask/prot/port):
(172.16.1.0/255.255.255.0/0/0) current_peer: 10.10.10.1, username: cisco dynamic allocated
peer ip: 0.0.0.0 #pkts encaps: 655, #pkts encrypt: 655, #pkts digest: 655 #pkts decaps: 706,
#pkts decrypt: 706, #pkts verify: 706 #pkts compressed: 0, #pkts decompressed: 0 #pkts not
compressed: 655, #pkts comp failed: 0, #pkts decomp failed: 0 #send errors: 0, #recv errors:
0 local crypto endpt.: 10.20.20.1, remote crypto endpt.: 10.10.10.1 path mtu 1500, ipsec
overhead 60, media mtu 1500 current outbound spi: 3EA12BBE inbound esp sas: spi: 0x9B94D824
(2610223140) transform: esp-des esp-md5-hmac in use settings ={RA, Tunnel, } slot: 0,
conn_id: 4, crypto-map: myDYN-MAP sa timing: remaining key lifetime (sec): 25015 IV size: 8
bytes replay detection support: Y outbound esp sas: spi: 0x3EA12BBE (1050749886) transform:
esp-des esp-md5-hmac in use settings ={RA, Tunnel, } slot: 0, conn_id: 4, crypto-map: myDYN-
MAP sa timing: remaining key lifetime (sec): 25011 IV size: 8 bytes replay detection
support: Y ASA5520-704#
```

Команды show для вынесенного аппаратного клиента PIX EasyVPN и пример выходных данных

- **команда vpnclient enable включает удаленное подключение Easy VPN.** В режиме расширения сети (Network Extension Mode, NEM) туннель остается включенным, даже если нет значимого трафика для обмена с сервером головного узла EasyVPN.`pix506-635(config)#`**`vpnclient enable`**
- **команда show crypto isakmp policy выводит параметры для каждой политики IKE.**`pix506-635#`**`show crypto isakmp policy`** `Default protection suite encryption algorithm: DES - Data Encryption Standard (56 bit keys). hash algorithm: Secure Hash Standard authentication method: Rivest-Shamir-Adleman Signature Diffie-Hellman group: #1 (768 bit) lifetime: 86400 seconds, no volume limit` **Эти выходные данные показывают результаты команды show crypto isakmp policy после включения аппаратного клиента.**`pix506-635(config)#`**`show crypto isakmp policy`** `Protection suite of priority 65001 encryption algorithm: AES - Advanced Encryption Standard (256 bit keys). hash algorithm: Secure Hash Standard authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65002 encryption algorithm: AES - Advanced Encryption Standard (256 bit keys). hash algorithm: Message Digest 5 authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65003 encryption algorithm: AES - Advanced Encryption Standard (192 bit keys). hash algorithm: Secure Hash Standard authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65004 encryption algorithm: AES - Advanced Encryption Standard (192 bit keys). hash algorithm: Message Digest 5 authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65005 encryption algorithm: AES - Advanced Encryption Standard (128 bit keys). hash algorithm: Secure Hash Standard authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65006 encryption algorithm: AES - Advanced Encryption Standard (128 bit keys). hash algorithm: Message Digest 5 authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65007 encryption algorithm: Three key triple DES hash algorithm: Secure Hash Standard authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65008 encryption algorithm: Three key triple DES hash algorithm: Message Digest 5 authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65009 encryption algorithm: DES - Data Encryption Standard (56 bit keys). hash algorithm: Message Digest 5 authentication method: Pre-Shared Key with XAUTH Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65010 encryption algorithm: AES - Advanced Encryption Standard (256 bit keys). hash algorithm: Secure Hash Standard authentication method: Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65011 encryption algorithm: AES - Advanced Encryption Standard (256 bit keys). hash algorithm: Message Digest 5 authentication method: Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority 65012 encryption`

```
algorithm: AES - Advanced Encryption Standard (192 bit keys). hash algorithm: Secure Hash
Standard authentication method: Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime:
86400 seconds, no volume limit Protection suite of priority 65013 encryption algorithm: AES
- Advanced Encryption Standard (192 bit keys). hash algorithm: Message Digest 5
authentication method: Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime: 86400
seconds, no volume limit Protection suite of priority 65014 encryption algorithm: AES -
Advanced Encryption Standard (128 bit keys). hash algorithm: Secure Hash Standard
authentication method: Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime: 86400
seconds, no volume limit Protection suite of priority 65015 encryption algorithm: AES -
Advanced Encryption Standard (128 bit keys). hash algorithm: Message Digest 5 authentication
method: Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no
volume limit Protection suite of priority 65016 encryption algorithm: Three key triple DES
hash algorithm: Secure Hash Standard authentication method: Pre-Shared Key Diffie-Hellman
group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit Protection suite of priority
65017 encryption algorithm: Three key triple DES hash algorithm: Message Digest 5
authentication method: Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime: 86400
seconds, no volume limit Protection suite of priority 65018 encryption algorithm: DES - Data
Encryption Standard (56 bit keys). hash algorithm: Message Digest 5 authentication method:
Pre-Shared Key Diffie-Hellman group: #2 (1024 bit) lifetime: 86400 seconds, no volume limit
```

- **show crypto isakmp sa — отображает все текущие IKE SA на одноранговом узле.**
```
pix506-635#show crypto isakmp sa Total : 1 Embryonic : 0 dst src state pending created 10.20.20.1
10.10.10.1 QM_IDLE 0 4 pix506-635#
```
- **show crypto ipsec sa - Отображает сопоставление IPSec SA, построенное между узлами.**
```
pix506-635#show crypto ipsec sa interface: outside Crypto map tag: _vpnc_cm, local
addr. 10.10.10.1 local ident (addr/mask/prot/port): (172.16.1.0/255.255.255.0/0/0) remote
ident (addr/mask/prot/port): (172.22.1.0/255.255.255.0/0/0) current_peer: 10.20.20.1:500
PERMIT, flags={origin_is_acl,} #pkts encaps: 706, #pkts encrypt: 706, #pkts digest 706 #pkts
decaps: 655, #pkts decrypt: 655, #pkts verify 655 #pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress f ailed: 0 #send errors 1,
#recv errors 0 local crypto endpt.: 10.10.10.1, remote crypto endpt.: 10.20.20.1 path mtu
1500, ipsec overhead 56, media mtu 1500 current outbound spi: 9b94d824 inbound esp sas: spi:
0x3ea12bbe(1050749886) transform: esp-des esp-md5-hmac , in use settings ={Tunnel, } slot:
0, conn id: 3, crypto map: _vpnc_cm sa timing: remaining key lifetime (k/sec):
(4607941/24712) IV size: 8 bytes replay detection support: Y inbound ah sas: inbound pcp
sas: outbound esp sas: spi: 0x9b94d824(2610223140) transform: esp-des esp-md5-hmac , in use
settings ={Tunnel, } slot: 0, conn id: 4, crypto map: _vpnc_cm sa timing: remaining key
lifetime (k/sec): (4607958/24712) IV size: 8 bytes replay detection support: Y outbound ah
sas: outbound pcp sas:
```
- **команда show vpnclient служит для отображения данных конфигурации для клиента VPN или удаленного устройства Easy VPN.**
```
pix506-635#show vpnclient LOCAL CONFIGURATION
vpnclient server 10.20.20.1 vpnclient mode network-extension-mode vpnclient vpngroup
mytunnel password ******** vpnclient username cisco password ******** vpnclient enable
DOWNLOADED DYNAMIC POLICY Current Server : 10.20.20.1 PFS Enabled : No Secure Unit
Authentication Enabled : No User Authentication Enabled : No Split Networks :
172.22.1.0/255.255.255.0 Backup Servers : None pix506-635#
```

Устранение неполадок

В этом разделе описывается процесс устранения неполадок конфигурации.

Если удаленный аппаратный клиент EasyVPN и сервер EasyVPN были установлены так, как описано в этом документе, но проблемы все еще возникают, соберите выходные данные команды debug с каждого PIX и выходные данные команды show для их анализа службой технической поддержки Cisco. Дополнительные сведения см. в документах Устранение проблем блока PIX для передачи трафика данных на установленном туннеле IPSec или Устранение проблем протокола IP Security — общие сведения и использование команд debug. Разрешить отладку протокола IPSec на блоке расширения параллельного интерфейса (PIX).

В этих разделах приводятся команд debug для PIX и пример выходных данных.

- Команды сервера EasyVPN
- Команды для вынесенного аппаратного клиента EasyVPN

Средство Output Interpreter (OIT) (только для зарегистрированных клиентов) поддерживает определенные команды show. **Посредством OIT можно анализировать выходные данные команд show.**

Примечание: Прежде чем выполнять какие-либо команды отладки , ознакомьтесь с документом "Важные сведения о командах отладки".

Команды сервера EasyVPN

- **debug crypto ipsec – отображает согласования IPSec на Этапе 2.**
- **debug crypto isakmp – отображает согласования ISAKMP на 1-м этапе.**

Пример выходных данных приведен ниже.

```
ASA5520-704#debug crypto ipsec 2 ASA5520-704#debug crypto isakmp 2 ASA5520-704# Sep 15 23:02:42
[IKEv1]: IP = 10.10.10.1, Connection landed on tunnel_group mytunnel Sep 15 23:02:43 [IKEv1]:
Group = mytunnel, Username = cisco, IP = 10.10.10.1, User (cisco) authenticated. Sep 15 23:02:48
[IKEv1]: Group = mytunnel, Username = cisco, IP = 10.10.10.1, PHASE 1 COMPLETED Sep 15 23:02:48
[IKEv1]: Group = mytunnel, Username = cisco, IP = 10.10.10.1, IKE: requesting SPI! Sep 15
23:02:48 [IKEv1]: Group = mytunnel, Username = cisco, IP = 10.10.10.1, Security negotiation
complete for User (cisco) Responder, Inbound SPI = 0x436fbef1, Outbound SPI = 0x5c6b5137 Sep 15
23:02:48 [IKEv1]: Group = mytunnel, Username = cisco, IP = 10.10.10.1, IKE: requesting SPI! Sep
15 23:02:48 [IKEv1]: Group = mytunnel, Username = cisco, IP = 10.10.10.1, Starting P2 Rekey
timer to expire in 27360 seconds Sep 15 23:02:48 [IKEv1]: Group = mytunnel, Username = cisco, IP
= 10.10.10.1, PHASE 2 COMPLETED (msgid=dc3aa1ef) Sep 15 23:02:48 [IKEv1]: Group = mytunnel,
Username = cisco, IP = 10.10.10.1, Security negotiation complete for User (cisco) Responder,
Inbound SPI = 0x69352d74, Outbound SPI = 0x4a7e47fc Sep 15 23:02:48 [IKEv1]: Group = mytunnel,
Username = cisco, IP = 10.10.10.1, Starting P2 Rekey timer to expire in 27360 seconds Sep 15
23:02:48 [IKEv1]: Group = mytunnel, Username = cisco, IP = 10.10.10.1, PHASE 2 COMPLETED
(msgid=58a397ad)
```

Команды для вынесенного аппаратного клиента EasyVPN

- **debug crypto ipsec – отображает согласования IPSec на Этапе 2.**
- **debug crypto isakmp – отображает согласования ISAKMP на 1-м этапе.**

```
pix506-635(config)#vpnclient enable ISAKMP (0): ID payload next-payload : 13 type : 11 protocol :
17 port : 0 length : 12pix506-635(config)# ISAKMP (0): Total payload length: 16 ISAKMP
(0:0): sending NAT-T vendor ID - rev 2 & 3 ISAKMP (0): beginning Aggressive Mode exchange
crypto_isakmp_process_block:src:10.20.20.1, dest:10.10.10.1 spt:500 dpt:500 OAK_AG exchange
ISAKMP (0): processing SA payload. message ID = 0 ISAKMP (0): Checking ISAKMP transform 9
against priority 65001 policy ISAKMP: encryption DES-CBC ISAKMP: hash MD5 ISAKMP: default
group 2 ISAKMP: extended auth pre-share (init) ISAKMP: life type in seconds ISAKMP: life
duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are not acceptable. Next payload is 0
ISAKMP (0): Checking ISAKMP transform 9 against priority 65002 policy ISAKMP: encryption
DES-CBC ISAKMP: hash MD5 ISAKMP: default group 2 ISAKMP: extended auth pre-share (init)
ISAKMP: life type in seconds ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0):
atts are not acceptable. Next payload is 0 ISAKMP (0): Checking ISAKMP transform 9 against
priority 65003 policy ISAKMP: encryption DES-CBC ISAKMP: hash MD5 ISAKMP: default group 2
ISAKMP: extended auth pre-share (init) ISAKMP: life type in seconds ISAKMP: life duration
(VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are not acceptable. Next payload is 0 ISAKMP
(0): Checking ISAKMP transform 9 against priority 65004 policy ISAKMP: encryption DES-CBC
ISAKMP: hash MD5 ISAKMP: default group 2 ISAKMP: extended auth pre-share (init) ISAKMP: life
type in seconds ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are not
acceptable. Next payload is 0 ISAKMP (0): Checking ISAKMP transform 9 against priority 65005
policy ISAKMP: encryption DES-CBC ISAKMP: hash MD5 ISAKMP: default group 2 ISAKMP: extended
```

auth pre-share (init) ISAKMP: life type in seconds ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are not acceptable. Next payload is 0 ISAKMP (0): Checking ISAKMP transform 9 against priority 65006 policy ISAKMP: encryption DES-CBC ISAKMP: hash MD5 ISAKMP: default group 2 ISAKMP: extended auth pre-share (init) ISAKMP: life type in seconds ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are not acceptable. Next payload is 0 ISAKMP (0): Checking ISAKMP transform 9 against priority 65007 policy ISAKMP: encryption DES-CBC ISAKMP: hash MD5 ISAKMP: default group 2 ISAKMP: extended auth pre-share (init) ISAKMP: life type in seconds ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are not acceptable. Next payload is 0 ISAKMP (0): Checking ISAKMP transform 9 against priority 65008 policy ISAKMP: encryption DES-CBC ISAKMP: hash MD5 ISAKMP: default group 2 ISAKMP: extended auth pre-share (init) ISAKMP: life type in seconds ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are not acceptable. Next payload is 0 ISAKMP (0): Checking ISAKMP transform 9 against priority 65009 policy ISAKMP: encryption DES-CBC ISAKMP: hash MD5 ISAKMP: default group 2 ISAKMP: extended auth pre-share (init) ISAKMP: life type in seconds ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 ISAKMP (0): atts are acceptable. Next payload is 0 ISAKMP (0): processing KE payload. message ID = 0 ISAKMP (0): processing NONCE payload. message ID = 0 ISAKMP (0): processing ID payload. message ID = 0 ISAKMP (0): processing HASH payload. message ID = 0 crypto_isakmp_process_block:src:10.20.20.1, dest:10.10.10.1 spt:500 dpt:500 crypto_isakmp_process_block:src:10.20.20.1, dest:10.10.10.1 spt:500 dpt:500 ISAKMP : attributes being requested crypto_isakmp_process_block:src:10.20.20.1, dest:10.10.10.1 spt:500 dpt:500 ISAKMP (0): beginning Quick Mode exchange, M-ID of 1567562998:5d6f1cf6IPSEC (key_engine): got a queue event... IPSEC(spi_response): getting spi 0x411cf95(68276117) for SA from 10.20.20.1 to 10.10.10.1 for prot 3 crypto_isakmp_process_block:src:10.20.20.1, dest:10.10.10.1 spt:500 dpt:500 OAK_QM exchange oakley_process_quick_mode: OAK_QM_IDLE ISAKMP (0): processing SA payload. message ID = 1567562998 ISAKMP : Checking IPSec proposal 1 ISAKMP: transform 1, ESP_DES ISAKMP: attributes in transform: ISAKMP: SA life type in seconds ISAKMP: SA life duration (basic) of 28800 ISAKMP: SA life type in kilobytes ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0 ISAKMP: encaps is 1 ISAKMP: authenticator is HMAC-MD5 ISAKMP (0): atts are acceptable.IPSEC(validate_proposal_request): proposal part #1, (key eng. msg.) dest= 10.20.20.1, src= 10.10.10.1, dest_proxy= 172.22.1.0/255.255.255.0/0/0 (type=4), src_proxy= 10.10.10.1/255.255.255.255/0/0 (type=1), protocol= ESP, transform= esp-des esp-md5-hmac , lifedur= 0s and 0kb, spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4 ISAKMP (0): processing NONCE payload. message ID = 1567562998 ISAKMP (0): processing ID payload. message ID = 1567562998 ISAKMP (0): processing ID payload. message ID = 1567562998 ISAKMP (0): Creating IPSec SAs inbound SA from 10.20.20.1 to 10.10.10.1 (proxy 172.22.1.0 to 10.10.10.1) has spi 68276117 and conn_id 5 and flags 4 lifetime of 28800 seconds lifetime of 4608000 kilobytes outbound SA from 10.10.10.1 to 10.20.20.1 (proxy 10.10.10.1 to 172.22.1.0) has spi 418090151 and conn_id 6 and flags 4 lifetime of 28800 seconds lifetime of 4608000 kilobytesIPSEC(key_engine): got a queue event... IPSEC(initialize_sas): , (key eng. msg.) dest= 10.10.10.1, src= 10.20.20.1, dest_proxy= 10.10.10.1/255.255.255.255/0/0 (type=1), src_proxy= 172.22.1.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac , lifedur= 28800s and 4608000kb, spi= 0x411cf95(68276117), conn_id= 5, keysize= 0, flags= 0x4 IPSEC(initialize_sas): , (key eng. msg.) src= 10.10.10.1, dest= 10.20.20.1, src_proxy= 10.10.10.1/255.255.255.255/0/0 (type=1), dest_proxy= 172.22.1.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac , lifedur= 28800s and 4608000kb, spi= 0x18eb8ca7(418090151), conn_id= 6, keysize= 0, flags= 0x4 VPN Peer: IPSEC: Peer ip:10.20.20.1/500 Ref cnt incremented to:2 Total VPN Peers:1 VPN Peer: IPSEC: Peer ip:10.20.20.1/500 Ref cnt incremented to:3 Total VPN Peers:1 return status is IKMP_NO_ERROR ISAKMP (0): beginning Quick Mode exchange, M-ID of 43279810:29465c2IPSEC(key_engine): got a queue event... IPSEC(spi_response): getting spi 0xa12022dd(2703237853) for SA from 10.20.20.1 to 10.10.10.1 for prot 3 crypto_isakmp_process_block:src:10.20.20.1, dest:10.10.10.1 spt:500 dpt:500 OAK_QM exchange oakley_process_quick_mode: OAK_QM_IDLE ISAKMP (0): processing SA payload. message ID = 43279810 ISAKMP : Checking IPSec proposal 1 ISAKMP: transform 1, ESP_DES ISAKMP: attributes in transform: ISAKMP: SA life type in seconds ISAKMP: SA life duration (basic) of 28800 ISAKMP: SA life type in kilobytes ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0 ISAKMP: encaps is 1 ISAKMP: authenticator is HMAC-MD5 ISAKMP (0): atts are acceptable.IPSEC(validate_proposal_request): proposal part #1, (key eng. msg.) dest= 10.20.20.1, src= 10.10.10.1, dest_proxy= 10.20.20.1/255.255.255.255/0/0 (type=1), src_proxy= 10.10.10.1/255.255.255.255/0/0 (type=1), protocol= ESP, transform= esp-des esp-md5-hmac , lifedur= 0s and 0kb, spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4 ISAKMP (0): processing NONCE payload. message ID = 43279810 ISAKMP (0): processing ID payload. message ID = 43279810 ISAKMP (0): processing ID payload. message ID = 43279810 ISAKMP (0): Creating IPSec SAs inbound SA from 10.20.20.1 to 10.10.10.1 (proxy

```
10.20.20.1 to 10.10.10.1) has spi 2703237853 and conn_id 3 and flags 4 lifetime of 28800
seconds lifetime of 4608000 kilobytes outbound SA from 10.10.10.1 to 10.20.20.1 (proxy
10.10.10.1 to 10.20.20.1) has spi 1010314457 and conn_id 4 and flags 4 lifetime of 28800
seconds lifetime of 4608000 kilobytesIPSEC(key_engine): got a queue event...
IPSEC(initialize_sas): , (key eng. msg.) dest= 10.10.10.1, src= 10.20.20.1, dest_proxy=
10.10.10.1/255.255.255.255/0/0 (type=1), src_proxy= 10.20.20.1/255.255.255.255/0/0 (type=1),
protocol= ESP, transform= esp-des esp-md5-hmac , lifedur= 28800s and 4608000kb, spi=
0xa12022dd(2703237853), conn_id= 3, keysize= 0, flags= 0x4 IPSEC(initialize_sas): , (key
eng. msg.) src= 10.10.10.1, dest= 10.20.20.1, src_proxy= 10.10.10.1/255.255.255.255/0/0
(type=1), dest_proxy= 10.20.20.1/255.255.255.255/0/0 (type=1), protocol= ESP, transform=
esp-des esp-md5-hmac , lifedur= 28800s and 4608000kb, spi= 0x3c382cd9(1010314457), conn_id=
4, keysize= 0, flags= 0x4 VPN Peer: IPSEC: Peer ip:10.20.20.1/500 Ref cnt incremented to:4
Total VPN Peers:1 VPN Peer: IPSEC: Peer ip:10.20.20.1/500 Ref cnt incremented to:5 Total VPN
Peers:1 return status is IKMP_NO_ERROR ISAKMP (0): sending NOTIFY message 36136 protocol 1
crypto_isakmp_process_block:src:10.20.20.1, dest:10.10.10.1 spt:500 dpt:500 ISAKMP (0):
processing NOTIFY payload 36137 protocol 1 spi 0, message ID = 1608818011 ISAMKP (0):
received DPD_R_U_THERE_ACK from peer 10.20.20.1 return status is IKMP_NO_ERR_NO_TRANS
pix506-635(config)#
```

- **команда debug vpnclient выводит согласования, относящиеся к клиенту VPN.**`pix506-635(config)#`**`vpnclient enable`** `pix506-635(config)# 44: VPNC CFG: transform set unconfig attempt done 45: VPNC CLI: no isakmp keepalive 10 5 46: VPNC CLI: no isakmp nat-traversal 20 47: VPNC CFG: IKE unconfig successful 48: VPNC CLI: no crypto map _vpnc_cm 49: VPNC CFG: crypto map deletion attempt done 50: VPNC CFG: crypto unconfig successful 51: VPNC CLI: no global (outside) 65001 52: VPNC CLI: no nat (inside) 0 access-list _vpnc_acl 53: VPNC CFG: nat unconfig attempt failed 54: VPNC CLI: no http 172.16.1.1 255.255.255.0 inside 55: VPNC CLI: no http server enable 56: VPNC CLI: no access-list _vpnc_acl 57: VPNC CFG: ACL deletion attempt failed 58: VPNC CLI: no crypto map _vpnc_cm interface outside 59: VPNC CFG: crypto map de/attach failed 60: VPNC CLI: no sysopt connection permit-ipsec 61: VPNC CLI: sysopt connection permit-ipsec 62: VPNC CFG: transform sets configured 63: VPNC CFG: crypto config successful 64: VPNC CLI: isakmp keepalive 10 5 65: VPNC CLI: isakmp nat-traversal 20 66: VPNC CFG: IKE config successful 67: VPNC CLI: http 172.16.1.1 255.255.255.0 inside 68: VPNC CLI: http server enable 69: VPNC CLI: aaa-server _vpnc_nwp_server protocol tacacs+ 70: VPNC CLI: aaa-server _vpnc_nwp_server (outside) host 10.20.20.1 71: VPNC CLI: access-list _vpnc_nwp_acl permit ip any 172.22.1.0 255.255.255.0 72: VPNC CLI: aaa authentication match _vpnc_nwp_acl outbound _vpnc_nwp_server 73: VPNC CLI: no access-list _vpnc_acl 74: VPNC CFG: ACL deletion attempt failed 75: VPNC CLI: access-list _vpnc_acl permit ip host 10.10.10.1 host 10.20.20.1 76: VPNC CLI: crypto map _vpnc_cm 10 match address _vpnc_acl 77: VPNC CFG: crypto map acl update successful 78: VPNC CLI: no crypto map _vpnc_cm interface outside 79: VPNC CLI: crypto map _vpnc_cm interface outside 80: VPNC INF: IKE trigger request done 81: VPNC INF: Constructing policy download req 82: VPNC INF: Packing attributes for policy request 83: VPNC INF: Attributes being requested 84: VPNC ATT: ALT_SPLIT_INCLUDE 85: VPNC INF: 172.22.1.0/255.255.255.0 86: VPNC ATT: ALT_PFS: 0 87: VPNC INF: Received application version 'Cisco Systems, Inc ASA5520 Version 7.0(4) built by builders on Thu 13-Oct-05 21:43' 88: VPNC ATT: ALT_CFG_SEC_UNIT: 0 89: VPNC ATT: ALT_CFG_USER_AUTH: 0 90: VPNC CLI: no aaa authentication match _vpnc_nwp_acl outbound _vpnc_nwp_server 91: VPNC CLI: no access-list _vpnc_nwp_acl permit ip any 172.22.1.0 255.255.255.0 92: VPNC CLI: no aaa-server _vpnc_nwp_server 93: VPNC CLI: no access-list _vpnc_acl 94: VPNC CLI: access-list _vpnc_acl permit ip 172.16.1.0 255.255.255.0 172.22.1.0 255.255.255.0 95: VPNC CLI: access-list _vpnc_acl permit ip host 10.10.10.1 172.22.1.0 255.255.255.0 96: VPNC CLI: access-list _vpnc_acl permit ip host 10.10.10.1 host 10.20.20.1 97: VPNC CFG: _vpnc_acl ST define done 98: VPNC CFG: Split DNS config attempt done 99: VPNC CLI: crypto map _vpnc_cm 10 match address _vpnc_acl 100: VPNC CFG: crypto map acl update successful 101: VPNC CLI: no crypto map _vpnc_cm interface outside 102: VPNC CLI: crypto map _vpnc_cm interface outside 103: VPNC CLI: no global (outside) 65001 104: VPNC CLI: no nat (inside) 0 access-list _vpnc_acl 105: VPNC CFG: nat unconfig attempt failed 106: VPNC CLI: nat (inside) 0 access-list _vpnc_acl 107: VPNC INF: IKE trigger request done 108: VPNC INF: IKE trigger request done pix506-635(config)#`

Дополнительные сведения

- Cisco PIX Firewall Software

- Справочники по командам для межсетевого экрана PIX Cisco Secure
- Уведомления о дефектах продуктов по безопасности (включая PIX)
- Запросы комментариев (RFC)
- Согласование IPsec/Протоколы IKE
- Cisco Systems – техническая поддержка и документация