VPN.

-
  - authentication required disable
  - clear remote-access counters
  - clear remote-access session
  - description
  - enable
  - encryption mppe
  - remote-access
  - show remote-access configuration
  - show remote-access counters
  - show remote-access status
- L2TP over IPsec/PPTP-
  - authentication method
  - authentication mode
  - dns-servers
  - dscp
  - ipsec authentication method
  - ipsec authentication pre-shared-key
  - ipsec ike proposal
  - ipsec proposal
  - local-address
  - mtu
  - outside-address
  - remote-address
  - remote network
  - remote networks
  - username
  - wins-servers
- OpenVPN-
  - address-range
  - authentication algorithm
  - bridge-group
  - certificate
  - client-isolation
  - client-max
  - compression
  - dns-server
  - duplicate-cn
  - encryption algorithm
  - ip address
  - login authentication
  - network
  - port
  - protocol
  - redirect-gateway
  - route
  - timers holdtime
  - timers keepalive
  - subnet
  - tunnel
  - username
  - wins-server

authentication required disable

PPP- PPTP L2TP-.

(no) PPP PPTP L2TP-.

```
[no] authentication required disable
```

.

.

15

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

CONFIG-OPENVPN-SERVER

```
esr(config-pptp-server)# authentication required disable
```

clear remote-access counters

OpenVPN, PPTP L2TP over IPsec-.

```
clear remote-access counters [ pptp | l2tp | openvpn ] [ server <SERVER-NAME> ] [ username <USER-NAME> ] [ ip-address <ADRR> ]
```

<SERVER-NAME> – OpenVPN, PPTP L2TP over IPsec-;

<USER-NAME> – OpenVPN, PPTP L2TP over IPsec-;

<ADDR> – IP- OpenVPN, PPTP L2TP over IPsec-.

OpenVPN, PPTP L2TP over IPsec-.

10

ROOT

```
esr# clear remote-access counters
```

clear remote-access session

OpenVPN, PPTP L2TP over IPsec-.

```
clear remote-access session [ pptp | l2tp | openvpn] [ server <SERVER-NAME> ] [ username <USER-NAME> ] [ip-address <ADRR> ]
```

<SERVER-NAME> – OpenVPN, PPTP L2TP over IPsec-;

<USER-NAME> – OpenVPN, PPTP L2TP over IPsec-;

<ADDR> – IP- OpenVPN, PPTP L2TP over IPsec-. OpenVPN, PPTP L2TP over IPsec-.

10

ROOT

```
esr# clear remote-access session
```

description

OpenVPN, PPTP L2TP over IPsec-.

(no) .

```
description <DESCRIPTION>
no description
```

<DESCRIPTION> – , 255 .

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

CONFIG-OPENVPN-SERVER

PPTP-:

```
esr(config-pptp-server)# description "Our remote workers"
```

enable

.

(no) .

```
[no] enable
```

.

.

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

CONFIG-OPENVPN-SERVER

```
esr(config-pptp-server)# enable
```

encryption mppe

MPPE (Microsoft Point-to-Point Encryption) PPTP-.

(no) .

```
[no] encryption mppe
```

.

.

15

CONFIG-PPTP-SERVER

```
esr(config-pptp-server)# encryption mppe
```

remote-access

.

(no) .

```
[no] remote-access <SERVER-TYPE> <NAME>
```

<SERVER-TYPE> – . l2tp, openvpn, pptp

<NAME> – , 31 .

10

CONFIG

```
esr(config)# remote-access l2tp remote-workers
esr(config-l2tp-server)#
```

show remote-access configuration

OpenVPN, PPTP L2TP over IPsec-.

```
show remote-access configuration { pptp | l2tp | openvpn } [ <NAME> ]
```

<NAME> – OpenVPN, PPTP L2TP over IPsec .

OpenVPN, PPTP L2TP over IPsec-.

10

ROOT

```
esr# show remote-access configuration pptp pptp1
State:                     Enabled
Description:               --
Security zone:             trusted
Authentication mode:       local
MTU:                       1500
Local address:             192.168.1.1
Remote address:            rem_pptp(10.0.10.20-10.0.10.40)
Outside address:           115.0.0.1
DNS server:                --
WINS server:               --
   Users
   ~~~~~
#     Name                  State      Encrypted password
---   -------------------   --------   ------------------------------
0     pptp                  Enabled    8CB5107EA7005AFF
1     petr                  Enabled    CCE5513EE45A1EAC
```

show remote-access counters

OpenVPN, PPTP L2TP over IPsec .

```
show remote-access counters [ pptp | l2tp | openvpn ] [ server <SERVER-NAME> ] [ username <USER-NAME> ] [ ip-
address <ADRR> ]
```

<SERVER-NAME> – PPTP L2TP over IPsec ;

<USER-NAME> – OpenVPN, PPTP L2TP over IPsec ;

<ADDR> – IP- OpenVPN, PPTP L2TP over IPsec ;

OpenVPN, PPTP L2TP over IPsec .

10

ROOT

```
esr# show remote-access counters
User            IP-address        UC recv      Bytes recv   Err recv     MC recv
-------------   ---------------   ----------   ----------   ----------   ----------
ivan            10.20.20.5        262          25365        0            0
fedor           20.20.20.160      59           5236         0            0
User            IP-address        UC sent      Bytes sent   Err sent
-------------   ---------------   ----------   ----------   ----------
ivan            10.20.20.5        249          29298        0
fedor           20.20.20.160      16           739          0
esr# show remote-access counters l2tp
PPTP Server: remote-workers
User: ivan(10.20.20.5)
 Packets received:               231
 Bytes received:                 22229
 Dropped on receive:             0
 Receive errors:                 0
 Multicasts received:            0
 Receive length errors:          0
 Receive buffer overflow errors: 0
 Receive CRC errors:             0
 Receive frame errors:           0
 Receive FIFO errors:            0
 Receive missed errors:          0
 Receive compressed:             0
 Packets transmitted:            189
 Bytes transmitted:              21858
 Dropped on transmit:            0
 Transmit errors:                0
 Transmit aborted errors:        0
 Transmit carrier errors:        0
 Transmit FIFO errors:           0
 Transmit heartbeat errors:      0
 Transmit window errors:         0
 Transmit comressed:             0
 Collisions:                     0
```

show remote-access status

OpenVPN, PPTP L2TP over IPsec .

```
show remote-access status [ pptp | l2tp | openvpn ] [ server <SERVER-NAME> ] [ username <USER-NAME> ] [ ip-address <ADRR> ]
```

<SERVER-NAME> – OpenVPN, PPTP L2TP over IPsec ;

<USER-NAME> – OpenVPN, PPTP L2TP over IPsec ;

<ADDR> – IP- OpenVPN, PPTP L2TP over IPsec .

OpenVPN, PPTP L2TP over IPsec .

10

ROOT

```
esr# show remote-access status
User               IP-address        Server
----------------   ---------------   ------------------------------------
ivan               10.20.20.5        pptp(remote-workers)
fedor              20.20.20.160      l2tp(remote-workers-l2tp)
Count sessions: 2
```

L2TP over IPsec/PPTP-

authentication method

, PPTP L2TP over IPsec.

(no) .

```
[no] authentication method <METHOD>
```

<METHOD> – , [chap, mschap, mschap-v2, eap, pap].

chap

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# authentication method mschap
```

authentication mode

, PPTP L2TP over IPsec.

(no) .

```
authentication mode { local | radius }
no authentication mode
```

- local – , .
- radius – , RADIUS-.

15

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# authentication mode local
```

dns-servers

DNS-, , PPTP L2TP over IPsec.

(no) DNS-.

```
dns-servers object-group <NAME>
no dns-servers
```

<NAME> – IP-, DNS-, 31 .

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# dns-servers object-group pptp_dns
```

dscp

DSCP IP- PPTP L2TP over IPsec-.

(no) DSCP .

```
dscp <DSCP>
no dscp
```

<DSCP> – DSCP, [0..63].

32

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# dscp 40
```

ipsec authentication method

IKE-. IKE-, «ipsec authentication pre-shared-key» (ipsec authentication pre-shared-key).

(no) .

```
ipsec authentication method pre-shared-key
no ipsec authentication method
```

pre-shared-key – , .

15

CONFIG-L2TP-SERVER

```
esr(config-l2tp-server)# ipsec authentication method pre-shared-key
```

ipsec authentication pre-shared-key

, , .

(no) .

```
ipsec authentication pre-shared-key { ascii-text { <TEXT> | encrypted <ENCRYPTED-TEXT> }| hexadecimal {<HEX> |
encrypted <ENCRYPTED-HEX> } }
no ipsec authentication pre-shared-key
```

<TEXT> – [1..64] ASCII .

<HEX> – [1..32] [2..128] (0xYYYY...) (YYYY...).

<ENCRYPTED-TEXT> – [1..32] , [2..128] ;

<ENCRYPTED-HEX> – [2..64] , [2..256] .

.

15

CONFIG-L2TP-SERVER

```
esr(config-l2tp-server)# ipsec authentication pre-shared-key ascii-text password
```

ipsec ike proposal

L2TP- , IKE.

(no) IKE.

```
[no] ipsec ike proposal <NAME>
```

<NAME> – IKE, 31 .

.

15

CONFIG-L2TP-SERVER

```
esr(config-l2tp-server)# ipsec ike proposal IKE_PROPOSAL
```

ipsec proposal

L2TP- , IPsec.

(no) IPsec.

```
[no] ipsec proposal <NAME>
```

<NAME> – IPsec, 31 .

.

15

CONFIG-L2TP-SERVER

```
esr(config-l2tp-server)# ipsec proposal IPSEC_PROPOSAL
```

local-address

IP-, PPTP L2TP over IPsec IP- .

(no) IP- .

```
local-address { object-group <NAME> | ip-address <ADDR> }
no local-address
```

<NAME> – IP-, IP- , 31 .

<ADDR> – IP- AAA.BBB.CCC.DDD, [0..255].

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# local-address object-group pptp_local
```

mtu

MTU , PPTP L2TP over IPsec.

(no) MTU .

```
mtu <MTU>
no mtu
```

<MTU> – MTU, [1280..1500].

1500

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# mtu 1400
```

outside-address

IP-, PPTP L2TP over IPsec .

(no) .

```
outside-address { object-group <NAME> | ip-address <ADDR> | interface { <IF> | <TUN> } }
no outside-address
```

<NAME> – IP-, , PPTP L2TP over IPsec , 31 .

<ADDR> – IP-, PPTP L2TP over IPsec , AAA.BBB.CCC.DDD, [0..255].

<IF> – , , .

<TUN> – , , .

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# outside-address object-group pptp_outside
```

remote-address

IP-, PPTP L2TP over IPsec IP- .

(no) IP- .

```
remote-address { object-group <NAME>| address-range <FROM-ADDR>-<TO-ADDR> }
no remote-address
```

<NAME> – IP-, IP- , 31 .

<FROM-ADDR> – IP- , AAA.BBB.CCC.DDD, [0..255].

<TO-ADDR> – IP- , AAA.BBB.CCC.DDD, [0..255].

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# remote-address object-group pptp_remote
```

remote network

IP- , PPTP/L2TP-.

(no) IP- , PPTP/L2TP-.

```
remote network <ADDR/LEN>
no remote network
```

<ADDR/LEN> – IP- . AAA.BBB.CCC.DDD/EE, AAA – DDD [0..255] EE [1..32].

10

CONFIG-PPP-USER

```
esr(config-ppp-user)# remote network 192.168.54.0/24
```

remote networks

IP- , PPTP/L2TP-.

(no) IP- , PPTP/L2TP-.

```
remote networks <OBJ-GROUP-NETWORK-NAME>
no remote network
```

<OBJ-GROUP-NETWORK-NAME> – IP/IPv6-, 31 .

10

CONFIG-PPP-USER

```
esr(config-ppp-user)# remote network 192.168.54.0/24
```

username

PPTP L2TP over IPsec . , PPP-.

(no) .

PPTP USER L2TP USER .

```
[no] username <NAME>
```

<NAME> – , 31 .

15

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# username fedor
esr(config-pptp-user)#
```

wins-servers

WINS-, , PPTP L2TP over IPsec.

(no) WINS-.

```
wins-servers object-group <NAME>
no wins-servers
```

<NAME> – IP-, WINS-, 31 .

10

CONFIG-PPTP-SERVER

CONFIG-L2TP-SERVER

```
esr(config-pptp-server)# wins-servers object-group l2tp_wins
```

OpenVPN-

address-range

IP-, OpenVPN- IP- L2.

(no) IP- .

```
address-range <FROM-ADDR>-<TO-ADDR>
no address-range
```

<FROM-ADDR> – IP- , AAA.BBB.CCC.DDD, [0..255].

<TO-ADDR> – IP- , AAA.BBB.CCC.DDD, [0..255].

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# address-range 192.168.1.10-192.168.1.250
```

authentication algorithm

OpenVPN.

(no) .

```
authentication algorithm <ALGORITHM>
no authentication-algorithm
```

<ALGORITHM> – :

- 8-128 bits key size: md4, rsa-md4, md5, rsa-md5, mdc2, rsa-mdc2
- 8-160 bits key size: sha, sha1, rsa-sha, rsa-sha1, rsa-sha1-2, dsa, dsa-sha, dsa-sha1, dsa-sha1-old, ripemd160, rsa-ripemd160, ecdsa-with-sha1
- 8-224 bits key size: sha-224, rsa-sha-224
- 8-256 bits key size: sha-256, rsa-sha-256
- 8-384 bits key size: sha-384, rsa-sha-384
- 8-512 bits key size: sha-512, rsa-sha-512, whirlpool

sha

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CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# authentication algorithm cleartext
```

bridge-group

OpenVPN L2-.

(no) L2-.

```
bridge-group <BRIDGE-ID>
no bridge-group
```

<BRIDGE-ID> – . , .

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# bridge-group 15
```

certificate

. *copy*, copy.

(no) .

```
certificate <CERTIFICATE-TYPE> <NAME>

no certificate <CERTIFICATE-TYPE>
```

<CERTIFICATE-TYPE> – , :

- ca – ;
- crl – ;
- dh – -;
- server-crt – ;
- server-key – ;
- ta – HMAC-
- client-key – OPENVPN-;
- client-crt – OPENVPN-.

<NAME> – , 31 .

15

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# certificate ca ca.crt
```

client-isolation

.

(no) .

```
[no] client-isolation
```

.

.

15

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# client-isolation
```

client-max

.

(no) .

```
client-max <VALUE>
no client-max
```

<VALUE> – , [1..65535].

.

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# clients-max 500
```

compression

OpenVPN.

(no) .

```
[no] compression
```

.

.

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# compression
```

dns-server

DNS-, .

(no) DNS-.

```
dns-server <ADDR>
no dns-server { <ADDR> | all }
```

<ADDR> – IP- DNS-a, AAA.BBB.CCC.DDD, [0..255];

all – IP-.

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# dns-server 1.1.1.1
```

duplicate-cn

.

(no) .

```
[no] duplicate-cn
```

.

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# duplicate-cn
```

encryption algorithm

, .

(no) .

```
encryption algorithm <ALGORITHM>
no encryption algorithm
```

<ALGORITHM> – , : des, blowfish128, aes128, des-ede, aes192, 3des, desx, aes256.

.

15

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# encryption algorithm aes128
```

ip address

IP- . (no) IP- .

```
[no] ip address <ADDR>
```

<ADDR> – IP-, :

AAA.BBB.CCC.DDD – IP- , AAA-DDD [0..255].

15

CONFIG-OPENVPN-USER

```
esr(config-openvpn-server)# username client
esr(config-openvpn-user)# ip address 10.10.100.15
```

login authentication

.

«default», – «local».

(no) .

```
login authentication <NAME>
no login authentication
```

<NAME> – , 31 .

default

15

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# login authentication OPENVPN-LIST
```

network

, IP- . IP- .

(no) .

```
network <ADDR/LEN>
no network
```

<ADDR/LEN> – IP- , :

- AAA.BBB.CCC.DDD/EE – IP- , AAA-DDD [0..255] EE [1..32].

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# network 192.168.25.0/24
```

port

TCP/UDP-, OpenVPN- .

(no) .

```
port <PORT>
no port
```

<PORT> – TCP/UDP , [1..65535].

1194

15

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# port 5000
```

protocol

.

(no) .

```
protocol <PROTOCOL>
no protocol
```

<TYPE> – , :

- TCP- TCP-;
- UDP- UDP-.

.

15

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# protocol udp
```

redirect-gateway

OpenVPN-, . IP- OpenVPN-.

(no) .

```
[no] redirect-gateway
```

.

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# redirect-gateway
```

route

, IP OpenVPN- (IP- , network, network).

(no) .

```
route <ADDR/LEN>
no route { <ADDR/LEN> | all }
```

<ADDR/LEN> – IP-, :

AAA.BBB.CCC.DDD/EE – IP- , AAA-DDD [0..255] EE [1..32];

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# route 192.168.25.0/24, 192.168.26.0/24
```

timers holdtime

, . 0. keepalive . , *3 * keepalive*.

(no) .

```
timers holdtime <TIME>
no timers holdtime
```

<TIME> – , [1..65535].

120

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# timers holdtime 360
```

timers keepalive

, .

(no) .

```
timers keepalive <TIME>
no timers keeaplive
```

<TIME> – , [1..65535].

10

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# timers keepalive 120
```

subnet

, OpenVPN-. OpenVPN- .

(no) , .

```
[no] subnet <ADDRLEN>
```

<ADDR/LEN> – IP-, :

AAA.BBB.CCC.DDD/EE – IP- , AAA-DDD [0..255] EE [1..32].

10

CONFIG-OPENVPN-USER

```
esr(config-openvpn-server)# username client
esr(config-openvpn-user)# subnet 192.168.25.128/28
```

tunnel

OpenVPN-.

(no) .

```
tunnel <TYPE>
no tunnel
```

<TYPE> – , :

- ip – -;
- ethernet – L2-.

.

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# tunnel ip
```

username

OpenVPN-.

(no) .

```
[no] username { <NAME> | all }
```

<NAME> – , 31 .

all – , .

15

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# username client
esr(config-openvpn-user)#
```

wins-server

WINS-, .

(no) WINS-.

```
wins-server <ADDR>
no wins-server { <ADDR> | all }
```

<ADDR> – IP- WINS , AAA.BBB.CCC.DDD, [0..255].

all – IP- DNS .

10

CONFIG-OPENVPN-SERVER

```
esr(config-openvpn-server)# wins-servers 1.1.1.1
```