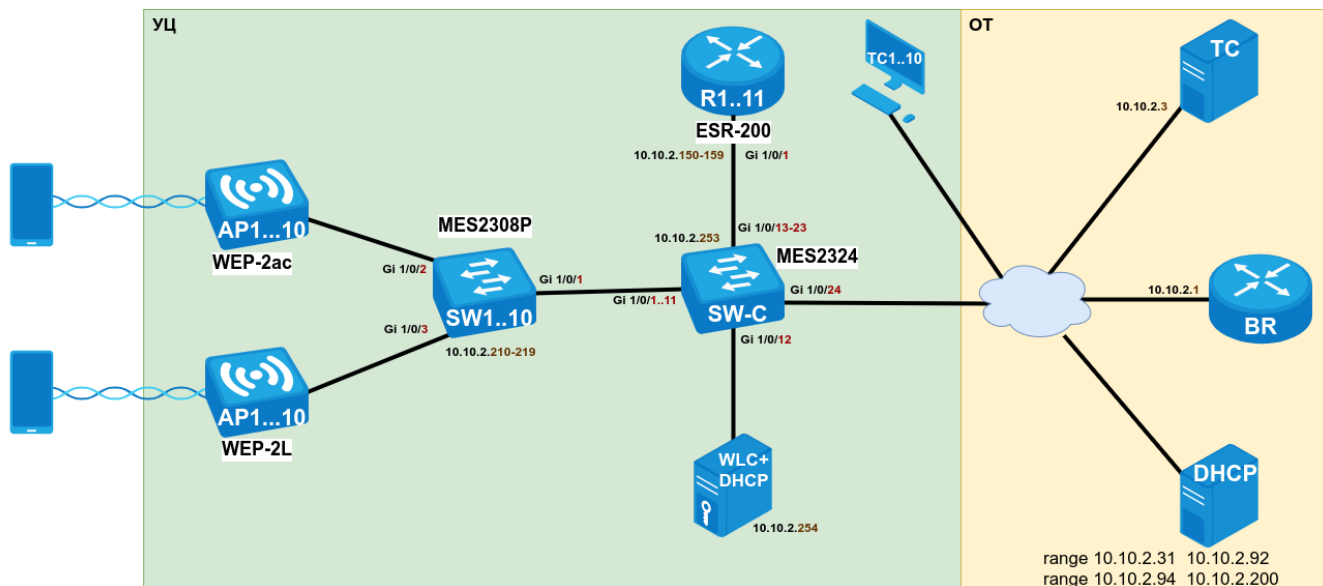




GRE:

	VLAN/subnet tunnel IP (MES)	VLAN/subnet GRE termination (ESR)	subnet AP MGMT (ESR)	subnet AP USER SSID1 (ESR)	VLAN/subnet AP USER SSID2 local-sw	admin (ESR)	admin (MES)
1	2001 / 192.168.101.0/24	2011 / 172.16.101.0/28	172.31.101.0/24	100.64.1.0/24	2021 / 100.64.101.0/24	10.10.2.151 /24	10.10.2.211 /24
2	2002 / 192.168.102.0/24	2012 / 172.16.102.0/28	172.31.102.0/24	100.64.2.0/24	2022 / 100.64.102.0/24	10.10.2.162 /24	10.10.2.2/24
3	2003 / 192.168.103.0/24	2013 / 172.16.103.0/28	172.31.103.0/24	100.64.3.0/24	2023 / 100.64.103.0/24	10.10.2.153 /24	10.10.2.213 /24
4	2004 / 192.168.104.0/24	2014 / 172.16.104.0/28	172.31.104.0/24	100.64.4.0/24	2024 / 100.64.104.0/24	10.10.2.154 /24	10.10.2.4/24
5	2005 / 192.168.105.0/24	2015 / 172.16.105.0/28	172.31.105.0/24	100.64.5.0/24	2025 / 100.64.105.0/24	10.10.2.155 /24	10.10.2.5/24
6	2006 / 192.168.106.0/24	2016 / 172.16.106.0/28	172.31.106.0/24	100.64.6.0/24	2026 / 100.64.106.0/24	10.10.2.156 /24	10.10.2.216 /24
7	2007 / 192.168.107.0/24	2017 / 172.16.107.0/28	172.31.107.0/24	100.64.7.0/24	2027 / 100.64.107.0/24	10.10.2.157 /24	10.10.2.7/24
8	2008 / 192.168.108.0/24	2018 / 172.16.108.0/28	172.31.108.0/24	100.64.8.0/24	2028 / 100.64.108.0/24	10.10.2.158 /24	10.10.2.218 /24
9	2009 / 192.168.109.0/24	2019 / 172.16.109.0/28	172.31.109.0/24	100.64.9.0/24	2029 / 100.64.109.0/24	10.10.2.159 /24	10.10.2.219 /24
10	2010 / 192.168.110.0/24	2020 / 172.16.110.0/28	172.31.110.0/24	100.64.10.0/24	2030 / 100.64.110.0/24	10.10.2.150 /24	10.10.2.210 /24
11	2011 / 192.168.111.0/24	2021 / 172.16.111.0/28	172.31.111.0/24	100.64.11.0/24	2031 / 100.64.111.0/24	10.10.2.160 /24	10.10.2.220 /24

SoftWLC, ISC-DHCP 10.10.2.254.

MES admin / admin

ESR admin / password

MES

:

```
vlan database
vlan 10
exit
!
hostname MES09
!
interface gigabitethernet1/0/1
switchport mode general
switchport general allowed vlan add 10 untagged
switchport general pvid 10
switchport forbidden default-vlan
exit
!
interface gigabitethernet1/0/2
switchport mode general
switchport general allowed vlan add 10 untagged
switchport general pvid 10
switchport forbidden default-vlan
exit
!
interface gigabitethernet1/0/3
switchport mode general
switchport general allowed vlan add 10 untagged
switchport general pvid 10
switchport forbidden default-vlan
exit
!
interface vlan 1
no ip address dhcp
exit
!
interface vlan 10
ip address 10.10.2.219 255.255.255.0
exit
!
!
end
```

:

```
no spanning-tree

ip dhcp relay address 10.10.2.254
ip dhcp relay enable
vlan database
    vlan 2009, 2019, 2029
exit

interface gigabitethernet1/0/1
    switchport mode general
    switchport general allowed vlan add 2019 tagged
exit

interface gigabitethernet1/0/2
    switchport mode general
    switchport general allowed vlan add 2029 tagged
    switchport general allowed vlan add 2009 untagged
    switchport general pvid 2009
    switchport forbidden default-vlan
exit

interface gigabitethernet1/0/3
    switchport mode general
    switchport general allowed vlan add 2029 tagged
    switchport general allowed vlan add 2009 untagged
    switchport general pvid 2009
    switchport forbidden default-vlan
exit

interface vlan 2009
    ip address 192.168.109.1 /24
    ip dhcp relay enable
exit
interface vlan 2019
    ip address 172.16.109.5 /28
    ip dhcp relay enable
exit
interface vlan 2029
    ip address 100.64.109.1 /24
    ip dhcp relay enable
exit
```

ESR

:

```
hostname ESR09
```

```
vlan 10  
exit
```

```
bridge 1  
  description "UpLink"  
  vlan 10  
  ip firewall disable  
  ip address 10.10.2.159/24  
  enable  
exit
```

```
interface gigabitethernet 1/0/1  
  mode switchport  
  switchport forbidden default-vlan  
  switchport mode trunk  
  switchport trunk native-vlan 10  
exit  
security passwords history 0  
ip telnet server  
ip ssh server
```

:

```
4# show system id  
Serial number:  
  NP15008778  
4# copy tftp://10.10.2.254:/NP15008778.lic system:licence  
4# reload system
```

:

```
ESR11# show licence  
Licence information  
-----  
Name:    eltex  
Version: 1.0  
Type:    ESR-200  
S/N:     NP15008778  
MAC:     E4:5A:D4:00:AA:9B  
Features:  
  WIFI - Wi-Fi controller  
  BRAS - Broadband Remote Access Server
```

ESR:

```
hostname ESR01  
  
object-group service dhcp_server  
  port-range 67  
exit  
object-group service dhcp_client  
  port-range 68  
exit  
object-group service ssh  
  port-range 22  
exit  
object-group service telnet  
  port-range 23  
exit  
object-group service ntp  
  port-range 123
```

```
exit

object-group network MGMT
  ip prefix 10.10.2.0/24
  ip prefix 172.31.109.0/24
  ip prefix 172.16.109.0/28
exit
object-group network nat_users
  ip prefix 100.64.9.0/24
exit

radius-server timeout 10
radius-server host 10.10.2.254
  key ascii-text testing123
  timeout 11
  source-address 10.10.2.159
  auth-port 31812
  acct-port 31813
  retransmit 2
  dead-interval 10
exit
aaa radius-profile PCRF
  radius-server host 10.10.2.254
exit
das-server COA
  key ascii-text testing123
  port 3799
  clients object-group MGMT
exit
aaa das-profile COA
  das-server COA
exit

vlan 10,2019
exit

no spanning-tree

domain lookup enable
domain name-server 77.88.8.8

security zone trusted
exit
security zone untrusted
exit
security zone user
exit
security zone gre
exit

bridge 1
  description "UpLink"
  vlan 10
  security-zone untrusted
  ip firewall disable
  ip address 10.10.2.159/24
  enable
exit
bridge 2
  description "GRE_termination"
  vlan 2019
  security-zone gre
  ip firewall disable
  ip address 172.16.109.1/28
  ip address 172.16.109.2/28
  enable
exit
bridge 3
  description "AP_MANAGMENT"
  security-zone trusted
```

```
ip firewall disable
ip address 172.31.109.1/24
ip helper-address 10.10.2.254
ip tcp adjust-mss 1418
protected-ports local
enable
exit
bridge 10
description "AP_SSID1_USERS"
security-zone user
ip firewall disable
ip address 100.64.9.1/24
ip helper-address 10.10.2.254
ip tcp adjust-mss 1418
location data10
protected-ports local
enable
exit

interface gigabitethernet 1/0/1
mode switchport
switchport forbidden default-vlan
switchport mode trunk
switchport trunk native-vlan 10
switchport trunk allowed vlan add 2019
exit
tunnel softgre 1
description "managment"
mode management
local address 172.16.109.1
default-profile
enable
exit
tunnel softgre 1.1
bridge-group 3
enable
exit
tunnel softgre 2
description "data"
mode data
local address 172.16.109.2
default-profile
enable
exit

snmp-server
snmp-server system-shutdown
snmp-server community "public" ro
snmp-server community "private" rw

snmp-server host 10.10.2.254
exit

snmp-server enable traps config
snmp-server enable traps config commit
snmp-server enable traps config confirm
snmp-server enable traps environment
snmp-server enable traps environment fan
snmp-server enable traps environment fan-speed-changed
snmp-server enable traps environment fan-speed-high
snmp-server enable traps environment memory-flash-critical-low
snmp-server enable traps environment memory-flash-low
snmp-server enable traps environment memory-ram-critical-low
snmp-server enable traps environment memory-ram-low
snmp-server enable traps environment cpu-load
snmp-server enable traps environment cpu-critical-temp
snmp-server enable traps environment cpu-overheat-temp
snmp-server enable traps environment cpu-supercooling-temp
snmp-server enable traps environment board-overheat-temp
snmp-server enable traps environment board-supercooling-temp
snmp-server enable traps file-operations
```

```
snmp-server enable traps file-operations successful
snmp-server enable traps file-operations failed
snmp-server enable traps file-operations canceled
snmp-server enable traps interfaces
snmp-server enable traps interfaces rx-utilization-high
snmp-server enable traps interfaces tx-utilization-high
snmp-server enable traps interfaces number-high
snmp-server enable traps screen
snmp-server enable traps screen dest-limit
snmp-server enable traps screen source-limit
snmp-server enable traps screen icmp-threshold
snmp-server enable traps screen udp-threshold
snmp-server enable traps screen syn-flood
snmp-server enable traps screen land
snmp-server enable traps screen winnuke
snmp-server enable traps screen icmp-frag
snmp-server enable traps screen udp-frag
snmp-server enable traps screen icmp-large
snmp-server enable traps screen syn-frag
snmp-server enable traps screen unknown-proto
snmp-server enable traps screen ip-frag
snmp-server enable traps screen port-scan
snmp-server enable traps screen ip-sweep
snmp-server enable traps screen syn-fin
snmp-server enable traps screen fin-no-ack
snmp-server enable traps screen no-flag
snmp-server enable traps screen spoofing
snmp-server enable traps screen reserved
snmp-server enable traps screen quench
snmp-server enable traps screen echo-request
snmp-server enable traps screen time-exceeded
snmp-server enable traps screen unreachable
snmp-server enable traps screen tcp-all-flags
snmp-server enable traps entity
snmp-server enable traps entity config-change
snmp-server enable traps entity-sensor
snmp-server enable traps entity-sensor threshold
snmp-server enable traps envmon
snmp-server enable traps envmon fan
snmp-server enable traps envmon shutdown
snmp-server enable traps envmon temperature
snmp-server enable traps flash
snmp-server enable traps flash insertion
snmp-server enable traps flash removal
snmp-server enable traps snmp
snmp-server enable traps snmp authentication
snmp-server enable traps snmp coldstart
snmp-server enable traps snmp linkdown
snmp-server enable traps snmp linkup
snmp-server enable traps syslog
```

```
security zone-pair gre self
```

```
rule 1
```

```
action permit
```

```
match protocol gre
```

```
enable
```

```
exit
```

```
rule 2
```

```
action permit
```

```
match protocol icmp
```

```
enable
```

```
exit
```

```
exit
```

```
security zone-pair trusted self
```

```
rule 1
```

```
action permit
```

```
match source-address MGMT
```

```
enable
```

```
exit
```

```
exit
```

```
security zone-pair trusted trusted
```

```
rule 1
    action permit
    match source-address MGMT
    enable
exit
security zone-pair trusted user
    rule 1
        action permit
        enable
    exit
exit
security zone-pair trusted gre
    rule 1
        action permit
        enable
    exit
exit
security zone-pair user self
    rule 1
        action permit
        match protocol udp
        match source-port dhcp_client
        match destination-port dhcp_server
        enable
    exit
exit
security zone-pair user trusted
    rule 1
        action permit
        match protocol udp
        match source-port dhcp_client
        match destination-port dhcp_server
        enable
    exit
exit
security zone-pair user untrusted
    rule 1
        action permit
        enable
    exit
exit
security zone-pair untrusted self
    rule 1
        action permit
        match source-address MGMT
        enable
    exit
exit

security passwords history 0

nat source
    ruleset nat_ALL
    to interface bridge 1
    rule 1
        match source-address nat_users
        match not destination-address MGMT
        action source-nat interface
        enable
    exit
exit
exit

ip dhcp-relay

ip route 0.0.0.0/0 10.10.2.1
ip route 192.168.109.0/24 172.16.109.5

wireless-controller
    nas-ip-address 10.10.2.159
```

```
data-tunnel configuration radius
aaa das-profile COA
aaa radius-profile PCRF
enable
exit
ip telnet server
ip ssh server

ntp enable
ntp server 10.10.2.254
exit
```

DHCP-server

:

```
default-lease-time 300;
max-lease-time 310;

log-facility local7;

#listening subnet
subnet 10.10.2.0 netmask 255.255.255.0 {}

# ,
class "ELTEX-DEVICES" {
    match if (
        (substring (option vendor-class-identifier, 0, 14)="ELTEX_WEP-12AC") or
        (substring (option vendor-class-identifier, 0, 14)="ELTEX_WOP-12AC") or
        (substring (option vendor-class-identifier, 0, 13)="ELTEX_WEP-2AC") or
        (substring (option vendor-class-identifier, 0, 12)="ELTEX_WOP-2L") or
        (substring (option vendor-class-identifier, 0, 12)="ELTEX_WEP-2L") or
        (substring (option vendor-class-identifier, 0, 12)="ELTEX_WEP-1L")
    );
}
```

():

```
#-----Stend 1-----
#   vlan 2009
subnet 192.168.109.0 netmask 255.255.255.0 {
    pool {
        option routers 192.168.109.1;
        range 192.168.109.10 192.168.109.254;
        option vendor-encapsulated-options 0B:0C:31:37:32:2E:31:36:2E:31:30:39:2E:31:0C:0C:31:37:32:2E:
31:36:2E:31:30:39:2E:32;
        allow members of "ELTEX-DEVICES";
    }
}

#   ESR09
subnet 172.31.109.0 netmask 255.255.255.0 {
    pool {
        option routers 172.31.109.1;
        range 172.31.109.10 172.31.109.254;
        option vendor-encapsulated-options 0A:0B:31:30:2E:31:30:2E:32:2E:32:35:34;
        allow members of "ELTEX-DEVICES";
        option domain-name-servers 172.31.109.1;
    }
}

#   SSID1 ESR09 (in GRE)
subnet 100.64.9.0 netmask 255.255.255.0 {
    pool {
        option routers 100.64.9.1;
        range 100.64.9.10 100.64.9.254;
        option domain-name-servers 100.64.9.1;
    }
}

#   SSID2 (local switching)
subnet 100.64.109.0 netmask 255.255.255.0 {
    pool {
        option routers 100.64.109.1;
        range 100.64.109.10 100.64.109.254;
        option domain-name-servers 100.64.109.1;
    }
}
```

SoftWLC ():

```
#ip route stend 1
ip route add 192.168.109.0/24 via 10.10.2.219
ip route add 172.31.109.0/24 via 10.10.2.159
ip route add 100.64.9.0/24 via 10.10.2.159
ip route add 100.64.109.0/24 via 10.10.2.159
```

, IP-

```
MES11#show arp
Total number of entries: 4
```

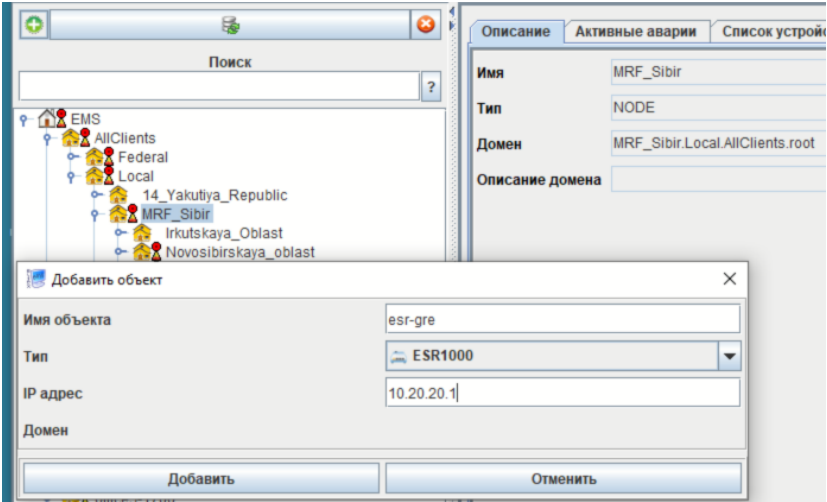
VLAN	Interface	IP address	HW address	status
vlan 10	gi1/0/1	10.10.2.3	56:6f:3d:7f:00:51	dynamic
vlan 10	gi1/0/1	10.10.2.254	d8:5e:d3:aa:02:98	dynamic
vlan 2011	gi1/0/3	192.168.111.253	cc:9d:a2:e9:d6:50	dynamic
vlan 2011	gi1/0/2	192.168.111.254	cc:9d:a2:e9:73:40	dynamic

MAC- +1 MAC- (50+1 40+1)

```
ESR11# show arp bridge 3
Interface      IP address      MAC address      State      Age(min)
-----
bridge 3       172.31.111.1    e4:5a:d4:00:aa:9b  --         --
bridge 3       172.31.111.10   cc:9d:a2:e9:73:41  permanent  --
bridge 3       172.31.111.11   cc:9d:a2:e9:d6:51  permanent  --
```

ESR EMS

EMS, , ESR "+", :



. 3.

, :

- " " - ESR "esr-gre".
- "" - , ESR "ESR200".
- "IP" - ESR "10.10.2.151".

"".

ESR (- "  ") "".

Редактировать 'Доступ'

Описание: нет

IP адрес: 10.20.20.1

SNMP порт: 161

SNMP транспорт: UDP

Файловый протокол: FTP

Таймаут обмена, мс: 60000

Read community / User v3: public11

Write community / Password v3: private1

Версия SNMP: v2c

Регистрация трапов: Accept

Выведено из обслуживания: ☐

Дата 'Выведено из обслуживания': 19.11.2018 19:29:13

Статус: AVAILABLE

Время статуса: 04.06.2020 13:27:05

Telnet/SSH login: admin

Telnet/SSH password: password

SSH порт: 22

MAC адрес:

BRAS сервис: ☐

Режим ESR: Station

OTT (Over-the-top): None

Режим кластера: None

Принять Заполнить местоположение Заполнить геокоординаты Отменить

. 4.

:

- " " - "FTP".
- "Read community" - SNMP RO community, (- testing123).
- "Write community" - SNMP RW community, (- testing123).

radius, ESR. EMS "RADIUS" " ". ESR (IP ESR) "":

Управление точками доступа на RADIUS сервере

Изменить поля Обновить Добавить Редактировать Удалить

Фильтр: 10.20.20.1 Страница: 1 / 1 на странице: 100 Всего записей: 1310 Найдено по фильтру: 1

ID	Адрес	Домен	Имя	Тип	Ключ	Описание
7347	10.20.20.1	MRF_Sibir.Local.AllClients.root	esr1000-slave	ESR	eltex	

Редактирование объекта

Адрес: 10.20.20.1

Домен: MRF_Sibir.Local.AllClients.root

Имя: esr1000-slave

Тип: ESR

Ключ: testing123

Описание:

Принять Отменить

. 5.

, "" ESR (- testing123) "".

SoftGRE ESR

SoftGRE :

```

ESR11# show tunnels status
Tunnel      Admin  Link  MTU    Local IP      Remote IP      Last change
           state state
-----
softgre 1   Up     Up     1462    172.16.111.1  192.168.111.254 59 minutes and 19 seconds
softgre 1.1 Up     Up     1458    --           --              59 minutes and 19 seconds
softgre 2   Up     Up     1462    172.16.111.1  192.168.111.253 58 minutes and 53 seconds
softgre 2.1 Up     Up     1458    --           --              58 minutes and 53 seconds
softgre 3   Up     Up     1462    172.16.111.2  192.168.111.254 2 minutes and 44 seconds
softgre 3.225 Up     Up     1458    --           --              2 minutes and 44 seconds
softgre 4   Up     Up     1462    172.16.111.2  192.168.111.253 2 minutes and 44 seconds
softgre 4.225 Up     Up     1458    --           --              2 minutes and 44 seconds

```

"Bridge" SoftGRE :

```

ESR11# show interfaces bridge
Bridges  Interfaces
-----
bridge 1  vlan 10
bridge 2  vlan 2021
bridge 3  softgre 1.1, softgre 2.1
bridge 10 softgre 3.225, softgre 4.225

```

- L3 SSID ,
- DATA- ESR Station. ESR-20 – Client, ESR-200 – StatinCE, ESR-1000 – Station. , . ESR-200, EMS ESR Station
- SSID VLAN-ID (), . [], (> > shaper... > SSID shaper)
 - ESR-1200 , SoftGRE, . .. SoftGRE .
 - , , ESR .
- - , , . " " , " " " data-tunnel ESR" ""
- (testing123) COA ESR (das-server COA) (PCRF > BRAS VRF). RADIUS ESR (radius-server host 10.10.2.254), EMS (RADIUS >).