

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РФ

Федеральное государственное автономное  
образовательное учреждение высшего образования  
«Национальный исследовательский университет ИТМО»

**ФАКУЛЬТЕТ ПРОГРАММНОЙ ИНЖЕНЕРИИ И КОМПЬЮТЕРНОЙ ТЕХНИКИ**

## **ЛАБОРАТОРНАЯ РАБОТА №6**

по дисциплине

‘Администрирование систем и сетей’

***Выполнили:***

Студенты группы Р34312

Соболев Иван

Верещагин Егор

***Желаемая оценка: 3***

***Преподаватель:***

Максимов Андрей Николаевич



**УНИВЕРСИТЕТ ИТМО**

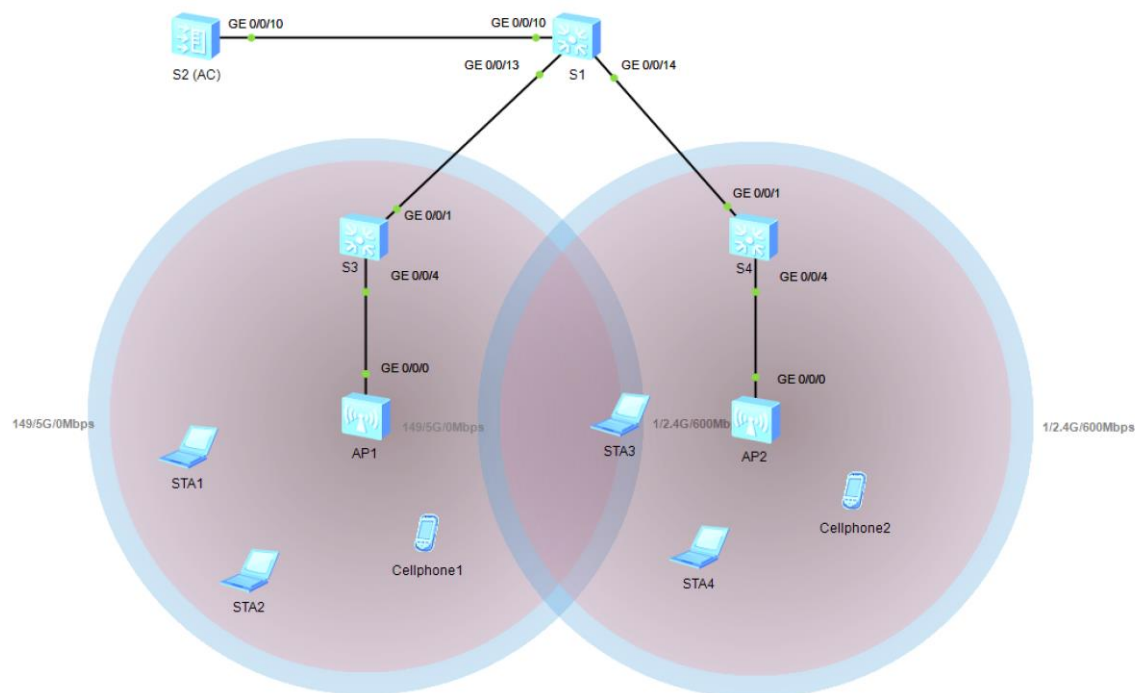
Санкт-Петербург, 2024

## Оглавление

Создание WLAN.....	3
Топология .....	3
Конфигурирование .....	3
Проверка.....	7
Вывод.....	8

# Создание WLAN

## Топология



## Конфигурирование

### Настройка параметров проводной сети

#### Настройка VLAN:

```
[S1]vlan batch 100 101
Info: This operation may take a few seconds. Please wait for a moment...done.
[S1]interface g0/0/13
[S1-GigabitEthernet0/0/13]port link-type trunk
[S1-GigabitEthernet0/0/13]port trunk allow-pass vlan 100 101
[S1-GigabitEthernet0/0/13]quit
[S1]interface g0/0/14
[S1-GigabitEthernet0/0/14]port link-type trunk
[S1-GigabitEthernet0/0/14]port trunk allow-pass vlan 100 101
[S1-GigabitEthernet0/0/14]quit
[S1]interface g0/0/10
[S1-GigabitEthernet0/0/10]port link-type trunk
[S1-GigabitEthernet0/0/10]port trunk allow-pass vlan 100 101
[S1-GigabitEthernet0/0/10]quit

[AC]vlan batch 100 101
Info: This operation may take a few seconds. Please wait for a moment...done.
[AC]interface g0/0/10
[AC-GigabitEthernet0/0/10]port link-type trunk
[AC-GigabitEthernet0/0/10]port trunk allow-pass vlan 100 101
```

```
[AC-GigabitEthernet0/0/10]quit
```

```
[S3]vlan batch 100 101
```

Info: This operation may take a few seconds. Please wait for a moment...done.

```
[S3]interface g0/0/1
```

```
[S3-GigabitEthernet0/0/1]port link-type trunk
```

```
[S3-GigabitEthernet0/0/1]port trunk allow-pass vlan 100 101
```

```
[S3-GigabitEthernet0/0/1]quit
```

```
[S3]interface g0/0/4
```

```
[S3-GigabitEthernet0/0/4]port link-type trunk
```

```
[S3-GigabitEthernet0/0/4]port trunk pvid vlan 100
```

```
[S3-GigabitEthernet0/0/4]port trunk allow-pass vlan 100 101
```

```
[S3-GigabitEthernet0/0/4]quit
```

```
[S4]vlan batch 100 101
```

Info: This operation may take a few seconds. Please wait for a moment...done.

```
[S4]interface g0/0/1
```

```
[S4-GigabitEthernet0/0/1]port link-type trunk
```

```
[S4-GigabitEthernet0/0/1]port trunk allow-pass vlan 100 to 101
```

```
[S4-GigabitEthernet0/0/1]quit
```

```
[S4]interface g0/0/4
```

```
[S4-GigabitEthernet0/0/4]port link-type trunk
```

```
[S4-GigabitEthernet0/0/4]port trunk pvid vlan 100
```

```
[S4-GigabitEthernet0/0/4]port trunk allow-pass vlan 100 to 101
```

```
[S4-GigabitEthernet0/0/4]quit
```

Настройка IP-адресов интерфейсов:

```
[S1]interface Vlanif 101
```

```
[S1-Vlanif101]ip addr 192.168.101.254 24
```

```
[S1-Vlanif101]quit
```

```
[S1]interface LoopBack 0
```

```
[S1-LoopBack0] ip address 10.0.1.1 32
```

```
[S1-LoopBack0]quit
```

```
[AC]interface Vlanif 100
```

```
[AC-Vlanif100]ip addr 192.168.100.254 24
```

Настройка DHCP:

```
[S1]dhcp enable
```

Info: The operation may take a few seconds. Please wait for a moment.done.

```
[S1]ip pool sta
```

Info:It's successful to create an IP address pool.

```
[S1-ip-pool-sta]network 192.168.101.0 mask 24
```

```
[S1-ip-pool-sta]gateway-list 192.168.101.254
```

```
[S1-ip-pool-sta]quit
```

```
[S1]interface Vlanif 101
```

```
[S1-Vlanif101]dhcp select global
```

```
[S1-Vlanif101]quit
```

```
[AC]dhcp enable
Info: The operation may take a few seconds. Please wait for a moment.done.
[AC]ip pool ap
Info: It is successful to create an IP address pool.
[AC-ip-pool-ap]network 192.168.100.254 mask 24
[AC-ip-pool-ap]gateway-list 192.168.100.254
[AC-ip-pool-ap]quit
[AC]interface Vlanif 100
[AC-Vlanif100]dhcp select global
[AC-Vlanif100]quit
```

## Настройка параметров точек доступа для выхода в сеть

Создание группы AP ap-group1:

```
[AC]wlan
[AC-wlan-view]ap-group name ap-group1
Info: This operation may take a few seconds. Please wait for a moment.done.
[AC-wlan-ap-group-ap-group1]quit
```

Создание профиля регулирующего домена и настройка кода страны AC в профиле:

```
[AC]wlan
[AC-wlan-view]regulatory-domain-profile name default

[AC-wlan-regulate-domain-default]country-code cn
```

Установка привязки профиля регулирующего домена к группе AP:

```
[AC]wlan
[AC-wlan-view]ap-group name ap-group1
[AC-wlan-ap-group-ap-group1]regulatory-domain-profile default
Warning: Modifying the country code will clear channel, power and antenna gain
configurations of the radio and reset the AP. Continue?[Y/N]:Y
[AC-wlan-ap-group-ap-group1]quit
```

Указание интерфейса-источника на AC для установления туннелей CAPWAP:

```
[AC]capwap source interface Vlanif 100
```

Импорт точки доступа в AC и добавление их в группу AP с именем ap-group1:

```
[AC]wlan
[AC-wlan-view]ap auth-mode mac-auth
[AC-wlan-view]ap-id 0 ap-mac 00e0-fc25-18e0
[AC-wlan-ap-0]ap-name ap1
[AC-wlan-ap-0]ap-group ap-group1
Warning: This operation may cause AP reset. If the country code changes, it will
clear channel, power and antenna gain configurations of the radio, Whether to
continue?
```

```

[Y/N]:Y
[AC-wlan-ap-0]quit

[AC-wlan-view]ap-id 1 ap-mac 00e0-fc69-1eb0
[AC-wlan-ap-1]ap-name ap2
[AC-wlan-ap-1]ap-group ap-group1
Warning: This operation may cause AP reset. If the country code changes, it will
clear channel, power and antenna gain configurations of the radio, Whether to
continue?
[Y/N]:Y
[AC-wlan-ap-1]quit

```

Вывод на экран информации о текущей AP:

```

[AC]wlan
[AC-wlan-view]dis ap all
Info: This operation may take a few seconds. Please wait for a moment.done.
Total AP information:
nor : normal      [2]
-----
-----
ID  MAC          Name Group  IP          Type        State STA Upt
ime
-----
-----
0   00e0-fc25-18e0 ap1  ap-group1  192.168.100.239 AP2050DN    nor  0
46S
1   00e0-fc69-1eb0 ap2  ap-group1  192.168.100.81  AP2050DN    nor  0  8S
-----
-----
Total: 2

```

## Настройка параметров сервисов WLAN

Создание профиля безопасности HCIA-WLAN и настройка политики безопасности:

```

[AC-wlan-view]security-profile name HCIA-WLAN
[AC-wlan-sec-prof-HCIA-WLAN]security wpa-wpa2 psk pass-phrase HCIA-Datacom
aes

[AC-wlan-sec-prof-HCIA-WLAN]quit

```

Создание профиля SSID HCIA-WLAN и задание имени SSID HCIA-WLAN:

```

[AC-wlan-view]ssid-profile name HCIA-WLAN
[AC-wlan-ssid-prof-HCIA-WLAN]ssid HCIA-WLAN
Info: This operation may take a few seconds, please wait.done.
[AC-wlan-ssid-prof-HCIA-WLAN]quit

```

Создание профиля VAP HCIA-WLAN, настройка режима передачи данных и сервисного VLAN и применение профиля безопасности и профиля SSID к профилю VAP:

```

[AC-wlan-view]vap-profile name HCIA-WLAN

```

```
[AC-wlan-vap-prof-HCIA-WLAN]forward-mode direct-forward
[AC-wlan-vap-prof-HCIA-WLAN]service-vlan vlan-id 101
Info: This operation may take a few seconds, please wait.done.
[AC-wlan-vap-prof-HCIA-WLAN]security-profile HCIA-WLAN
Info: This operation may take a few seconds, please wait.done.
[AC-wlan-vap-prof-HCIA-WLAN]ssid-profile HCIA-WLAN
Info: This operation may take a few seconds, please wait.done.
[AC-wlan-vap-prof-HCIA-WLAN]quit
```

Установка привязки профиля VAP к группе AP и применение конфигурации профиля VAP HCIA-WLAN к радиомодулю 0 и радиомодулю 1 точек доступа в группе AP:

```
[AC-wlan-view]ap-group name ap-group1
[AC-wlan-ap-group-ap-group1]vap-profile HCIA-WLAN wlan 1 radio
all
```

## Проверка

Пароль: HCIA-Datacom

MAC Address: 54-89-98-26-04-4E

### IPv4 Configuration

☐ Static

☒ DHCP

IP Address:

. . .



Subnet Mask:

. . .

Gateway:

. . .

### Vap List

	SSID	Encription	Status	VAP MAC	Channel	Radio Type
	HCIA-WLAN	NULL	Connected	00-E0-FC-25-18-E0	1	802.11bgn
	HCIA-WLAN	NULL	Disconnected	00-E0-FC-25-18-F0	149	

Connect

Disconnect

Refresh

```
STA>ping 10.0.1.1
```

```
Ping 10.0.1.1: 32 data bytes, Press Ctrl_C to break
```

```
From 10.0.1.1: bytes=32 seq=1 ttl=255 time=141 ms
```

```
From 10.0.1.1: bytes=32 seq=2 ttl=255 time=125 ms
```

```
From 10.0.1.1: bytes=32 seq=3 ttl=255 time=141 ms
```

```
From 10.0.1.1: bytes=32 seq=4 ttl=255 time=125 ms
```

```
From 10.0.1.1: bytes=32 seq=5 ttl=255 time=140 ms
```

```
--- 10.0.1.1 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 125/134/141 ms
STA>
```

```
[AC]dis station all
Rf/WLAN: Radio ID/WLAN ID
Rx/Tx: link receive rate/link transmit rate(Mbps)
-----
-----
STA MAC      AP ID Ap name Rf/WLAN Band Type Rx/Tx  RSSI VLAN IP a
ddress      SSID
-----
-----
5489-9826-044e 0  ap1   0/1   2.4G -  -/-   -  101 192.
168.101.253 HCIA-WLAN
-----
-----
Total: 1 2.4G: 1 5G: 0
```

## Вывод

В ходе выполнения данной лабораторной работы мы сконфигурировали WLAN с помощью контроллера доступа (AC) и точек доступа AP, чтобы обеспечить доступ STA к WLAN.