УНИВЕРСИТЕТ ИТМО

Факультет программной инженерии и компьютерной техники

Направление подготовки 09.03.04 Программная инженерия

Дисциплина «Администрирование систем и сетей»

Лабораторная работа №6
«Создание WLAN»

Студенты:
Мальцева Ю. И.
Черкас И. И.
Р34141
Желаемая оценка:*3*

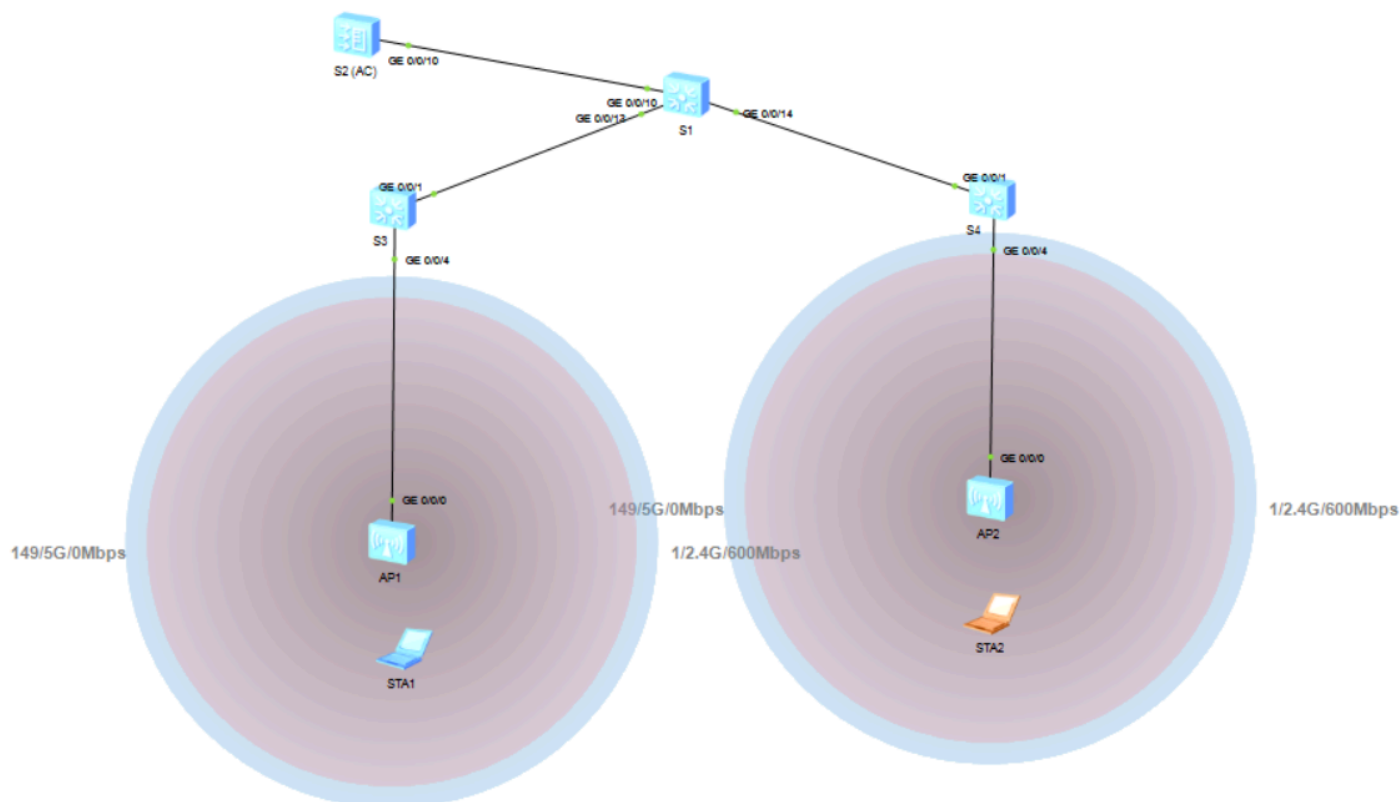**Преподаватель:**
Афанасьев Д. Б.

Санкт-Петербург, 2024 г.

Оглавление

Цель работы:

Лабораторная работа помогает получить практические навыки по изучению следующих тем:

- Процедура аутентификации точек доступа
- Процедура настройки профилей WLAN
- Процесс настройки основных параметров WLAN

Топология:

Шаг 1. Настроим основные параметры устройств.

Отключим ненужные порты между S1 и AC:

[S1]interface GigabitEthernet 0/0/11
[S1-GigabitEthernet0/0/11]shutdown
[S1-GigabitEthernet0/0/11]q

[S1]interface GigabitEthernet 0/0/12
[S1-GigabitEthernet0/0/12]shutdown
[S1-GigabitEthernet0/0/12]q

Шаг 2. Настроим параметры проводной сети

Настроим VLAN:

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

[S1]interface GigabitEthernet 0/0/10
[S1-GigabitEthernet0/0/10]port link-type trunk
[S1-GigabitEthernet0/0/10]port trunk allow-pass vlan 100 101
[S1-GigabitEthernet0/0/10]q

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

[S3]vlan batch 100 101
Info: This operation may take a few seconds. Please wait for a moment...done.
[S3]interface GigabitEthernet 0/0/1
[S3-GigabitEthernet0/0/1]port link-type trunk
[S3-GigabitEthernet0/0/1]port trunk allow-pass vlan 100 101
[S3-GigabitEthernet0/0/1]q
[S3]interface GigabitEthernet 0/0/4
[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]q

[S4]vlan batch 100 101
Info: This operation may take a few seconds. Please wait for a moment...done.
[S4]interface GigabitEthernet0/0/1
[S4-GigabitEthernet0/0/1]port link-type trunk
[S4-GigabitEthernet0/0/1] port trunk allow-pass vlan 100 to 101
[S4-GigabitEthernet0/0/1]q
[S4]port link-type trunk
[S4]GigabitEthernet0/0/4
[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]q

Команда настройки ip-адресов интерфейсов:

[S1]interface Vlanif 101
[S1-Vlanif101]ip address 192.168.101.254 24
Oct 25 2024 09:02:09-08:00 S1 %%01IFNET/4/LINK_STATE(l)[1]:The line protocol IP
on the interface Vlanif101 has entered the UP state.
[S1-Vlanif101]q
[S1]interface LoopBack 0
[S1-LoopBack0]ip address 10.0.1.1 32
[S1-LoopBack0]q

```
[AC]interface Vlanif 100
[AC-Vlanif100]ip address 192.168.100.254 24
Oct 25 2024 09:05:01-08:00 S1 %%01IFNET/4/LINK_STATE(l)[3]:The line protocol IP
on the interface Vlanif100 has entered the UP state.
[AC-Vlanif100]q
```

Команда настройки 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]q
[S1]interface Vlanif 101
[S1-Vlanif101]dhcp select global
[S1-Vlanif101]q

[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]q
[AC]interface Vlanif 100
[AC-Vlanif100]dhcp select global
[AC-Vlanif100]q
```

Шаг 3. Настроим параметры точек доступа для выхода в сеть

Создадим группу AP и назовем ее 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]q
```

Создадим профиль регулирующего домена и настроим код страны AC в профиле:

```
[AC-wlan-view]regulatory-domain-profile name default
[AC-wlan-regulate-domain-default]country-code cn
Info: The current country code is same with the input country code.
[AC-wlan-regulate-domain-default]q
```

Установим привязку профиля регулирующего домена к группе AP:

[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

Импортируем точки доступа в AC и добавим 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-FC06-10B0
[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 c
ontinue? [Y/N]:y
Info: This operation may take a few seconds. Please wait for a moment.. done.
[AC-wlan-ap-0]q

[AC-wlan-view]ap-id 1 ap-mac 00E0-FC50-60C0
[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 c
ontinue? [Y/N]:y
Info: This operation may take a few seconds. Please wait for a moment.. done.
[AC-wlan-ap-1]q

Выведем на экран информацию о текущей AP:

[AC-wlan-view]display ap all
Info: This operation may take a few seconds. Please wait for a moment.done.
Total AP information:
idle : idle   [2]

-
ID   MAC   Name Group   IP Type   State STA Uptime

-
0   00e0-fc06-10b0 ap1 ap-group1 192.168.100.161 AP2050DN nor 0 25S
1   00e0-fc50-60c0 ap2 ap-group1 192.168.100.201 AP2050DN nor 0 -
----
-
Total: 2

Шаг 4. Настроим параметры сервисов WLAN

Создадим профиль безопасности HCIA-WLAN и настроим политику безопасности:

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

Создадим профиль SSID HCIA-WLAN и зададим имя 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]q
```

Создадим профиль VAP HCIA-WLAN, настроим режим передачи данных и сервисного VLAN и применим профиль безопасности и профиль 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]q
```

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

```
[AC-wlan-ap-group-ap-group1]vap-profile HCIA-WLAN wlan 1 radio all
Info: This operation may take a few seconds, please wait...done.
[AC-wlan-ap-group-ap-group1]q
```

Проверка:

<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=125 ms
--- 10.0.1.1 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 125/131/141 ms

[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 address SSID

5489-98ba-15ed 0 ap1 0/1 2.4G - -/- - 101 192.168.101.253 HCIA-WLAN
-- Total: 1
2.4G: 1 5G: 0

Вывод:

В данной лабораторной работе мы изучили процедуры аутентификации точек доступа, настройки профилей WLAN и основные параметры WLAN.