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Факультет Программной Инженерии и Компьютерной Техники

**Лабораторная работа №6
по дисциплине «Администрирование систем и сетей»**

Желаемая оценка: 3

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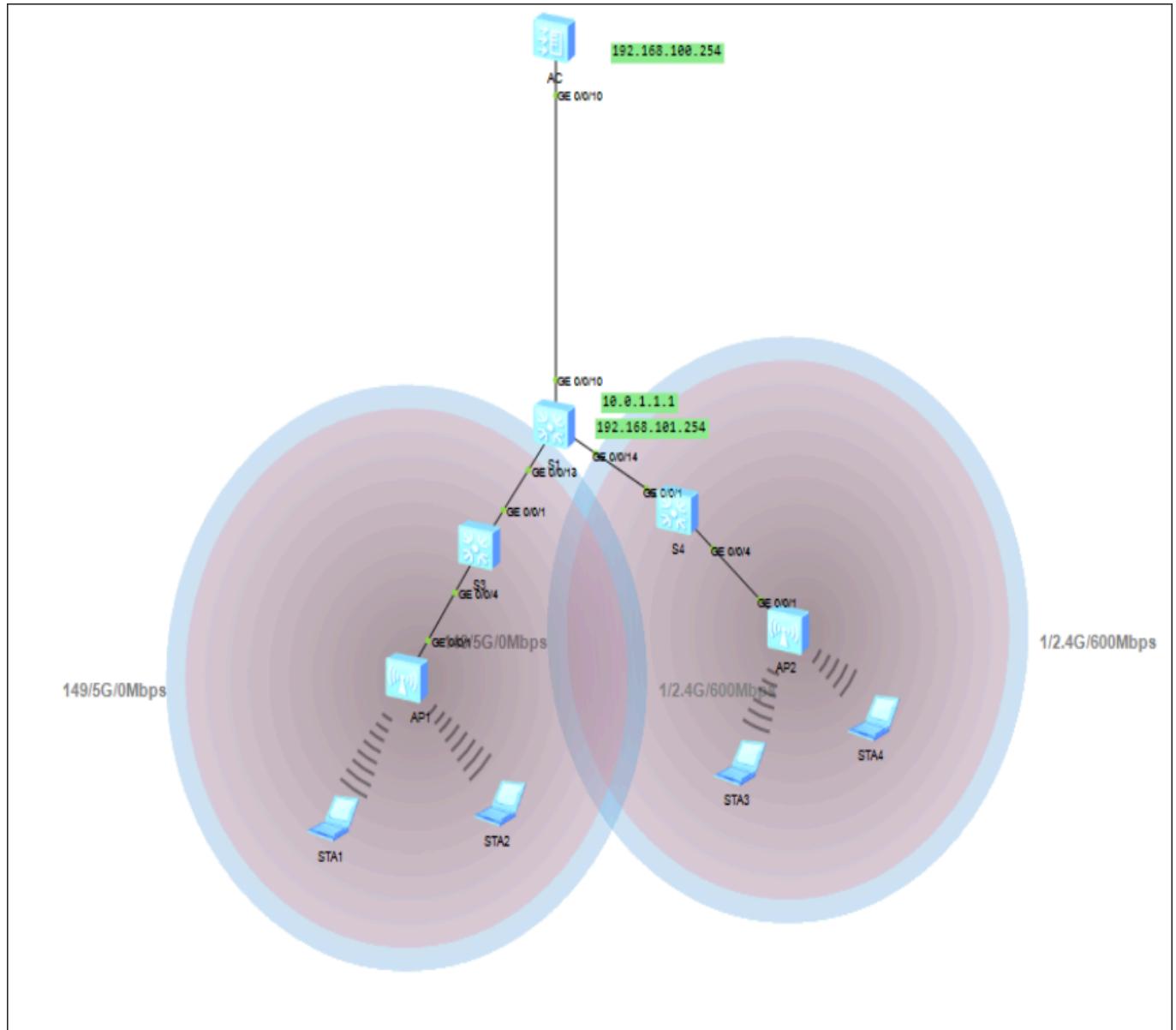
Выполнение работы

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



Конфигурация оборудования

Коммутатор S1

```
system-view
sysname S1
vlan batch 100 101

# Порт к AC
interface GigabitEthernet0/0/10
port link-type trunk
port trunk allow-pass vlan 100 101
quit

# Порт к S3
interface GigabitEthernet0/0/13
port link-type trunk
port trunk allow-pass vlan 100 101
quit

# Порт к S4
interface GigabitEthernet0/0/14
port link-type trunk
port trunk allow-pass vlan 100 101
quit

# IP интерфейс для клиентов (шлюз для VLAN 101)
interface Vlanif101
ip address 192.168.101.254 24
dhcp select global
quit

# LoopBack для тестов
interface LoopBack0
ip address 10.0.1.1 32
quit

# Настройка DHCP для клиентов WiFi
dhcp enable
ip pool sta
network 192.168.101.0 mask 24
gateway-list 192.168.101.254
quit

quit
save
```

Контроллер доступа AC

```
system-view
sysname AC
vlan batch 100 101

# Порт к S1
interface GigabitEthernet0/0/10
port link-type trunk
port trunk allow-pass vlan 100 101
quit

# IP интерфейс для управления AP
interface Vlanif100
ip address 192.168.100.254 24
dhcp select global
quit

# Настройка DHCP для точек доступа
dhcp enable
ip pool ap
network 192.168.100.0 mask 24
gateway-list 192.168.100.254
quit

# Настройка WLAN
wlan
# Режим аутентификации AP по MAC-адресу
ap auth-mode mac-auth

# Профиль регулирующего домена
regulatory-domain-profile name default
country-code cn
quit

# Профиль безопасности
security-profile name HCIA-WLAN
security wpa-wpa2 psk pass-phrase HCIA-Datacom aes
quit

# Профиль SSID
ssid-profile name HCIA-WLAN
ssid HCIA-WLAN
quit

# Профиль VAP
vap-profile name HCIA-WLAN
forward-mode direct-forward
service-vlan vlan-id 101
ssid-profile HCIA-WLAN
security-profile HCIA-WLAN
quit
```

```

# Группа AP
ap-group name ap-group1
regulatory-domain-profile default
vap-profile HCIA-WLAN wlan 1 radio all
quit

# Интерфейс-источник для CAPWAP
capwap source interface Vlanif 100

wlan

# ===== РЕГИСТРАЦИЯ AP1 =====
ap-id 0 ap-mac 00e0-fc52-4a60
ap-name ap1
ap-group ap-group1
quit

# ===== РЕГИСТРАЦИЯ AP2 =====
ap-id 1 ap-mac 00e0-fc30-4520
ap-name ap2
ap-group ap-group1
quit

quit
quit
save

```

Коммутатор S3

```

system-view
sysname S3
vlan batch 100 101

# Порт к S1
interface GigabitEthernet0/0/1
port link-type trunk
port trunk allow-pass vlan 100 101
quit

# Порт к AP1
interface GigabitEthernet0/0/4
port link-type trunk
port trunk pvid vlan 100
port trunk allow-pass vlan 100 101
poe enable
quit

quit
save

```

Коммутатор S4

```
system-view
sysname S4
vlan batch 100 101

# Порт к S1
interface GigabitEthernet0/0/1
port link-type trunk
port trunk allow-pass vlan 100 101
quit

# Порт к AP2
interface GigabitEthernet0/0/4
port link-type trunk
port trunk pvid vlan 100
port trunk allow-pass vlan 100 101
quit

quit
save
```

Вывод информации

Информация о текущей AP

```
[AC]display 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 Uptime
-----
0    00e0-fc52-4a60 ap1  ap-group1 192.168.100.196 AP6050DN      nor  2   1M:46S
1    00e0-fc30-4520 ap2  ap-group1 192.168.100.2   AP7050DE      nor  2   1M:36S
-----
Total: 2
```

Проверка связи

```
STA>ipconfig

Link local IPv6 address.....: ::
IPv6 address.....: :: / 128
IPv6 gateway.....: ::
IPv4 address.....: 192.168.101.253
Subnet mask.....: 255.255.255.0
Gateway.....: 192.168.101.254
Physical address.....: 54-89-98-2F-44-97
DNS server.....:

STA>ping ping 10.0.1.1
Bad argument: 10.0.1.1

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=156 ms
From 10.0.1.1: bytes=32 seq=2 ttl=255 time=172 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=187 ms
From 10.0.1.1: bytes=32 seq=5 ttl=255 time=187 ms

--- 10.0.1.1 ping statistics ---
```

```

5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 141/168/187 ms

```

Проверка информации STA

```

<AC>display 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
-----  

-----  

5489-982f-4497  1     ap2       0/1      2.4G   -      -/-      -      101    192.
168.101.253 HCIA-WLAN
5489-98d4-4627  0     ap1       0/1      2.4G   -      -/-      -      101    192.
168.101.250 HCIA-WLAN
5489-98e3-49e9  1     ap2       0/1      2.4G   -      -/-      -      101    192.
168.101.252 HCIA-WLAN
5489-98fb-6810  0     ap1       0/1      2.4G   -      -/-      -      101    192.
168.101.251 HCIA-WLAN
-----  

-----  

Total: 4 2.4G: 4 5G: 0

```

Конфигурация IP-адресов на S1

```

[S1]display ip interface brief
*down: administratively down
^down: standby
(1): loopback
(s): spoofing
The number of interface that is UP in Physical is 4
The number of interface that is DOWN in Physical is 1
The number of interface that is UP in Protocol is 3
The number of interface that is DOWN in Protocol is 2

Interface           IP Address/Mask      Physical  Protocol
LoopBack0          10.0.1.1/32        up        up(s)
MEth0/0/1          unassigned         down      down
NULL0              unassigned         up        up(s)
Vlanif1            unassigned         up        down
Vlanif101         192.168.101.254/24 up        up
[S1]

```

```
[S1]display ip interface brief
*down: administratively down
^down: standby
(l): loopback
(s): spoofing
The number of interface that is UP in Physical is 4
The number of interface that is DOWN in Physical is 1
The number of interface that is UP in Protocol is 3
The number of interface that is DOWN in Protocol is 2

Interface IP Address/Mask Physical Protocol
LoopBack0 10.0.1.1/32 up up(s)
MEth0/0/1 unassigned down down
NULL0 unassigned up up(s)
Vlanif1 unassigned up down
Vlanif101 192.168.101.254/24 up up
```

Таблица маршрутизации на S1

```
[S1]display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 5 Routes : 5

Destination/Mask Proto Pre Cost Flags NextHop Interface
10.0.1.1/32 Direct 0 0 D 127.0.0.1 LoopBack0
127.0.0.0/8 Direct 0 0 D 127.0.0.1 InLoopBack0
127.0.0.1/32 Direct 0 0 D 127.0.0.1 InLoopBack0
192.168.101.0/24 Direct 0 0 D 192.168.101.254 Vlanif101
192.168.101.254/32 Direct 0 0 D 127.0.0.1 Vlanif101
```

Конфигурация IP-адресов на S3

```
<S3>display ip interface brief
*down: administratively down
^down: standby
(l): loopback
(s): spoofing
The number of interface that is UP in Physical is 2
The number of interface that is DOWN in Physical is 1
The number of interface that is UP in Protocol is 1
The number of interface that is DOWN in Protocol is 2

Interface IP Address/Mask Physical Protocol
MEth0/0/1 unassigned down down
NULL0 unassigned up up(s)
Vlanif1 unassigned up down
```

Таблица маршрутизации на S3

```
<S3>display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 2      Routes : 2

Destination/Mask Proto Pre Cost      Flags NextHop      Interface
127.0.0.0/8     Direct 0   0          D   127.0.0.1    InLoopBack0
127.0.0.1/32   Direct 0   0          D   127.0.0.1    InLoopBack0
```

Конфигурация IP-адресов на S4

```
<S4>display ip interface brief
*down: administratively down
^down: standby
(l): loopback
(s): spoofing
The number of interface that is UP in Physical is 2
The number of interface that is DOWN in Physical is 1
The number of interface that is UP in Protocol is 1
The number of interface that is DOWN in Protocol is 2

Interface           IP Address/Mask      Physical   Protocol
MEth0/0/1          unassigned          down       down
NULL0              unassigned          up        up(s)
Vlanif1            unassigned          up        down
```

Таблица маршрутизации на S4

```
<S4>display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 2      Routes : 2

Destination/Mask Proto Pre Cost      Flags NextHop      Interface
127.0.0.0/8     Direct 0   0          D   127.0.0.1    InLoopBack0
127.0.0.1/32   Direct 0   0          D   127.0.0.1    InLoopBack0
```

Конфигурация IP-адресов на AC

```
<AC>display ip interface brief
*down: administratively down
```

```

^down: standby
(1): loopback
(s): spoofing
(E): E-Trunk down

The number of interface that is UP in Physical is 2
The number of interface that is DOWN in Physical is 1
The number of interface that is UP in Protocol is 2
The number of interface that is DOWN in Protocol is 1

```

Interface	IP Address/Mask	Physical	Protocol
MEth0/0/1	unassigned	down	down
NULL0	unassigned	up	up(s)
Vlanif100	192.168.100.254/24	up	up

Таблица маршрутизации на AC

Routing Tables: Public						
Destinations : 7			Routes : 7			
Destination/Mask	Proto	Pre	Cost	Flags	NextHop	Interface
127.0.0.0/8	Direct	0	0	D	127.0.0.1	InLoopBack0
127.0.0.1/32	Direct	0	0	D	127.0.0.1	InLoopBack0
127.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0
192.168.100.0/24	Direct	0	0	D	192.168.100.254	Vlanif100
192.168.100.254/32	Direct	0	0	D	127.0.0.1	Vlanif100
192.168.100.255/32	Direct	0	0	D	127.0.0.1	Vlanif100
255.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0