实践汇报

汇报人：Team1 & Team3

人员安排

拓扑图架构：陈莹莹

设备及真机配置：叶靖恺、吴佳帅、王俊哲、王勋、徐俊飞

PPT制作：王珊珊、阮康慧

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01

•实践要求

- 业务需求
- 技术需求
- 部署实施需求

业务需求

requirement

一、实现办公人员能够通过移动终端随时随地的接入公司

二、拟建设可承载语音、视频等高流量、低延时数据业务保障的网络

三、机构无线用户的数据无需经过总部无线AC处理

四、保证业务的安全性，无线网络必须提供对不同业务（办公、生产、监控及访客网络）之间进行安全隔离

技术需求

提供合理架构，本园区网建设基础网络部分，包括有线、无线部分

为移动办公用户提供基于用户的身份认证，并进行权限控制

平衡高可用和成本，总部和分支机构核心网络之间均采用冗余设备部署，实现主备切换用户无感知

部署实施需求

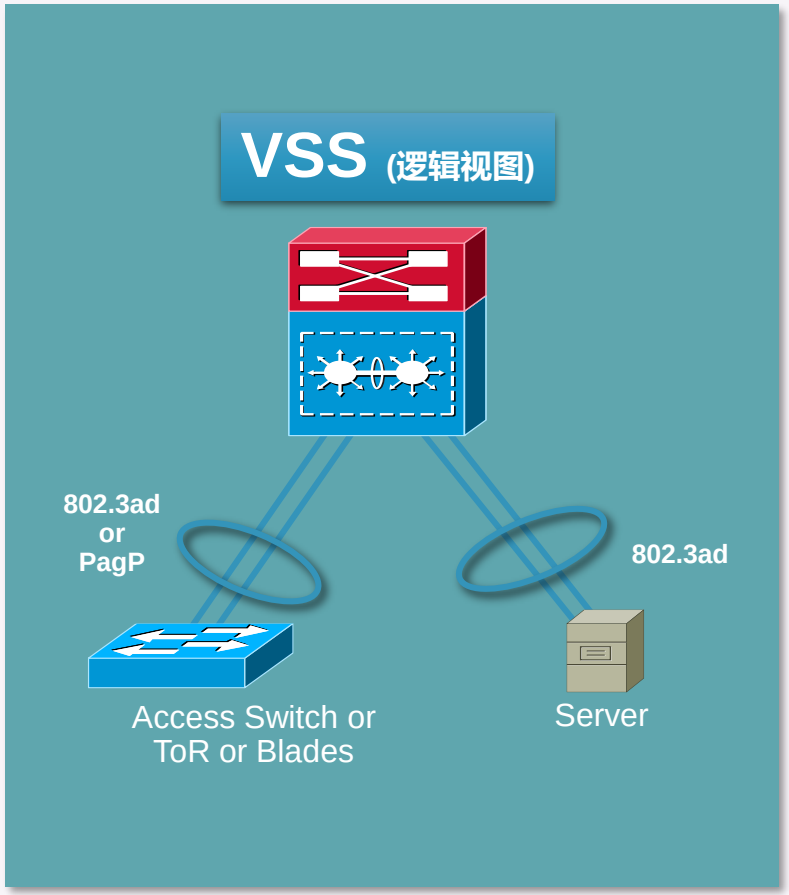
- 以PPT形式介绍整体实施方案
- 总部办公用户A通过ping通分支机构1的办公用户C

- 总部办公用户A不能ping通总部的访客用户D和生产终端B
- 核心交换机主备切换测试，实现主设备宕机之后，备用交换机可以切换流量

- 当WLC和分支机构AP失联之后，保证分支机构AP之间的用户流量可达
- 提供主要配置的模板和截图

02

•实验规划



实验步骤

1、拓扑图设计、IP地址规划及物理搭线

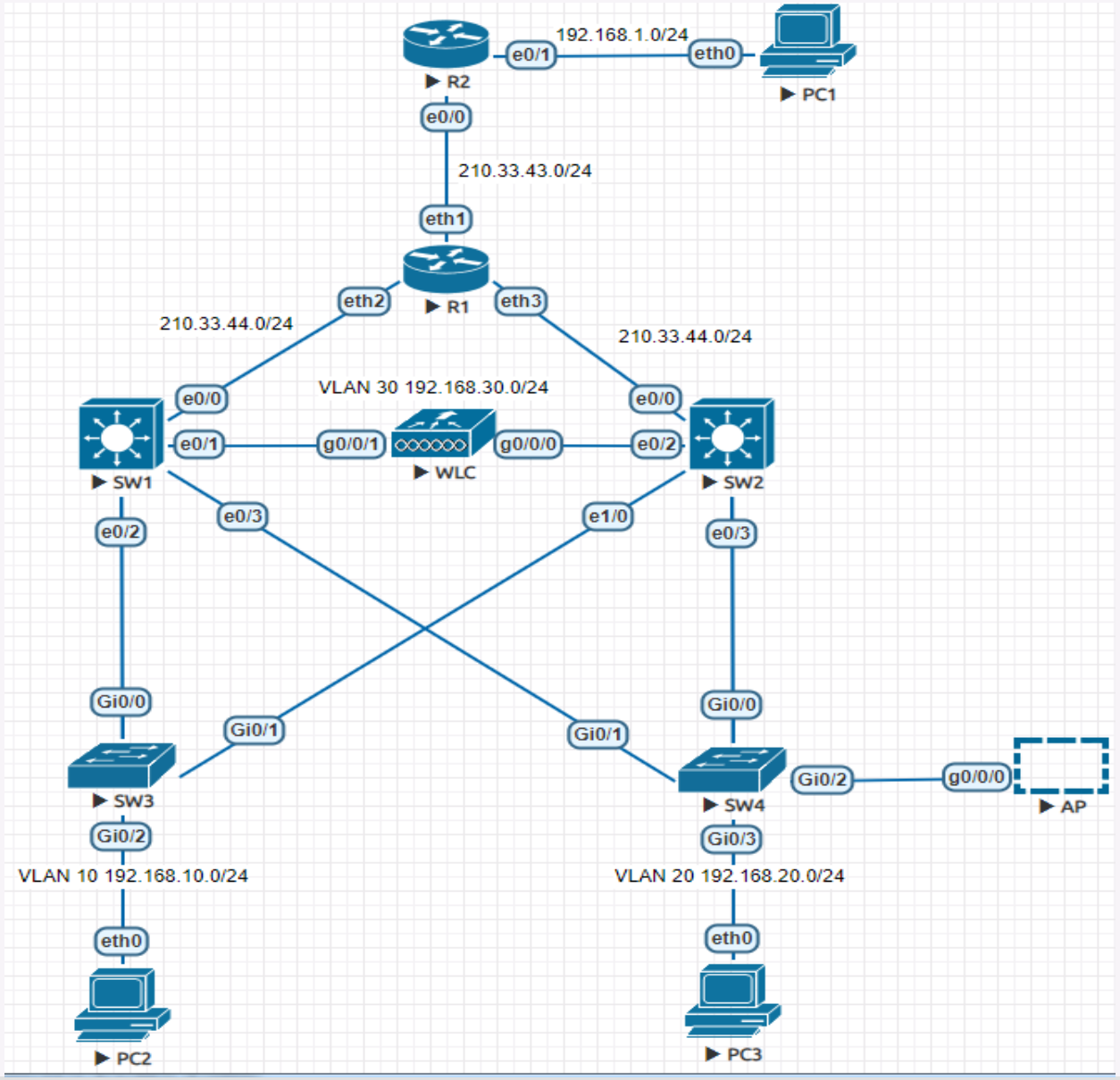
2、配置静态路由,实现全网通

3、配置IPsec VPN

4、WLC的配置及无线AP接入

5、配置核心交换机：两台核心交换机可采用以太网连接，通过HSRP实现冗余架构

拓扑图


192.168.1.0/24
e0/1
eth0
R2
PC1
e0/0
210.33.43.0/24
eth1
R1
eth2
eth3
210.33.44.0/24
210.33.44.0/24
VLAN 30 192.168.30.0/24
e0/0
e0/0
e0/1
g0/0/1
g0/0/0
e0/2
WLC
SW1
SW2
e0/3
e1/0
e0/2
e0/3
Gi0/0
Gi0/1
Gi0/1
Gi0/0
SW3
SW4
Gi0/2
g0/0/0
AP
Gi0/2
Gi0/3
VLAN 10 192.168.10.0/24
VLAN 20 192.168.20.0/24
eth0
eth0
PC2
PC3

03

•基本配置

总、分部路由器的接口配置

R2上

```
!
interface FastEthernet0/1
 ip address 192.168.1.1 255.255.255.0
 duplex auto
 speed auto
```

```
!
interface Serial0/0/3
 ip address 210.33.43.2 255.255.255.0
 clock rate 128000
 crypto map test
!
```

R1上

```
!
interface Serial0/0/2
 ip address 210.33.43.1 255.255.255.0
 crypto map test
!
```

```
!
interface FastEthernet0/0
 ip address 210.33.44.1 255.255.255.0
 duplex auto
 speed auto
```

```
interface FastEthernet0/1
 ip address 210.33.45.1 255.255.255.0
 duplex auto
 speed auto
!
```

路由配置

```
C     210.33.45.0/24 is directly connected, FastEthernet0/1
C     210.33.44.0/24 is directly connected, FastEthernet0/0
C     210.33.43.0/24 is directly connected, Serial0/0/2
      172.16.0.0/24 is subnetted, 2 subnets
S        172.16.0.0 is directly connected, FastEthernet0/0
                    is directly connected, FastEthernet0/1
S        172.16.1.0 is directly connected, FastEthernet0/0
                    is directly connected, FastEthernet0/1
S     192.168.1.0/24 is directly connected, Serial0/0/2
R1#
```

R1

```
R2(config)#do show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

C     210.33.43.0/24 is directly connected, Serial0/0/3
C     192.168.1.0/24 is directly connected, FastEthernet0/1
S*    0.0.0.0/0 is directly connected, Serial0/0/3
```

R2

总、分部路由器的VPN配置

R2上

```
!
crypto isakmp policy 10
 authentication pre-share
 group 2
 lifetime 3600
crypto isakmp key cisco address 210.33.43.1
!
crypto ipsec security-association lifetime seconds 1800
!
crypto ipsec transform-set 50 esp-des
!
crypto map test 10 ipsec-isakmp
 ! Incomplete
 set peer 210.33.43.1
 set security-association lifetime seconds 900
 set transform-set 50
 set pfs group2
```

R1上

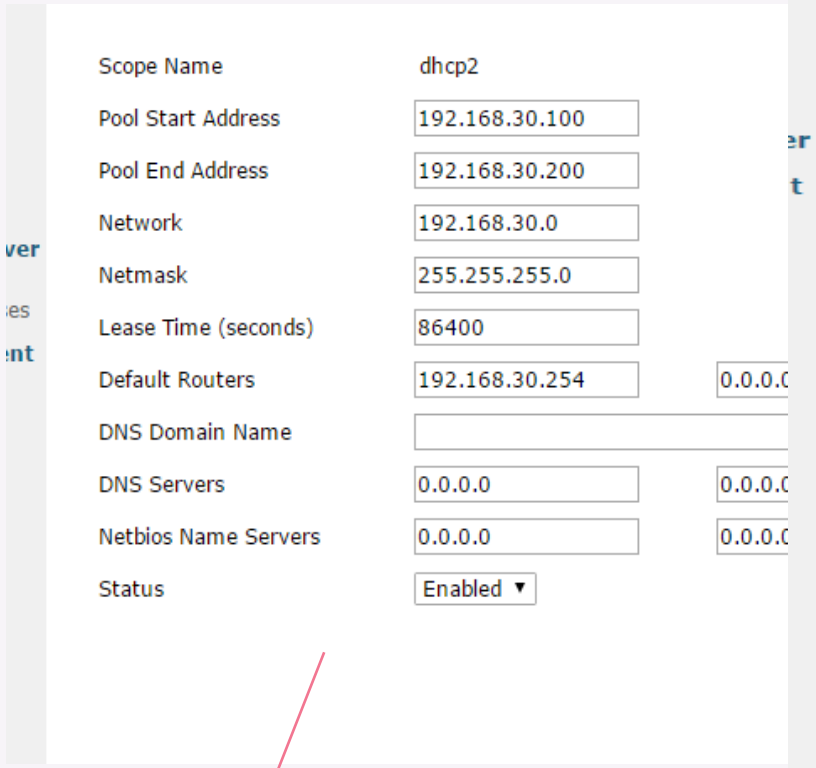
```
crypto isakmp policy 10
 authentication pre-share
 group 2
 lifetime 3600
crypto isakmp key natlab address 210.33.43.2
!
crypto ipsec security-association lifetime seconds 1800
!
crypto ipsec transform-set 50 esp-aes 256
!
crypto map test 10 ipsec-isakmp
 ! Incomplete
 set peer 210.33.43.2
 set security-association lifetime seconds 900
 set transform-set 50
 set pfs group2
!
```

WLC初始配置

```
Ethernet Multicast Forwarding.............. Disable
Ethernet Broadcast Forwarding.............. Disable

IPv4 AP Multicast/Broadcast Mode........... Multicast   Address : 239.0.0.10
IPv6 AP Multicast/Broadcast Mode.........
... Multicast   Address : ::
IGMP snooping.............................. Disabled
IGMP timeout.......................
....... 60 seconds
```

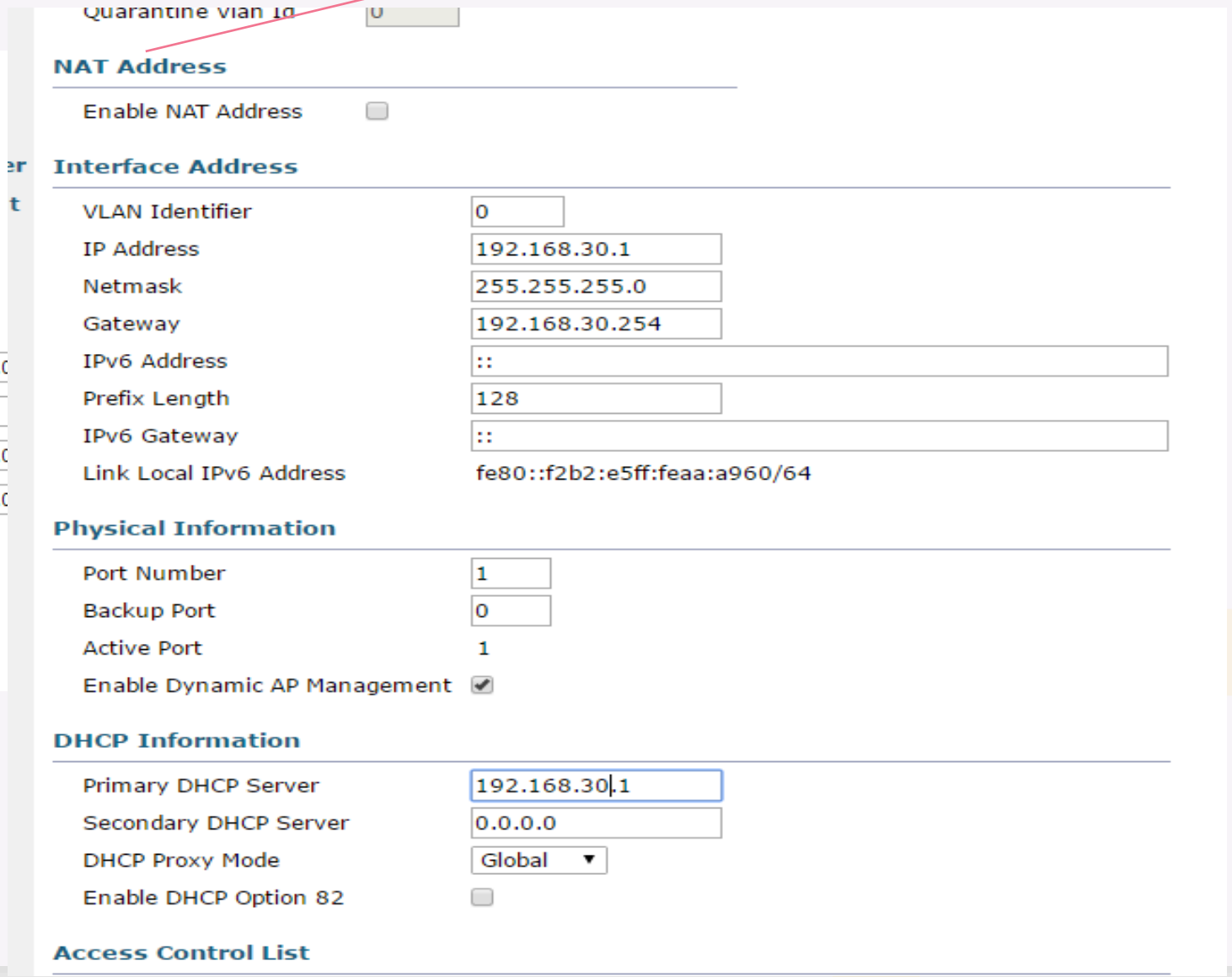
```
Build Type..................................... DATA + WPS

System Name.................................... Cisco_aa:a9:64
System Location.................................
System Contact..................................
System ObjectID................................ 1.3.6.1.4.1.9.1.1279
IP Address..................................... 192.168.0.1
IPv6 Address................................... ::
Last Reset..................................... Software reset
System Up Time................................. 0 days 0 hrs 8 mins 7 secs
System Timezone Location.......................
System Stats Realtime Interval................. 5
System Stats Normal Interval................... 180
```

WLC上配置



DHCP地址池配置

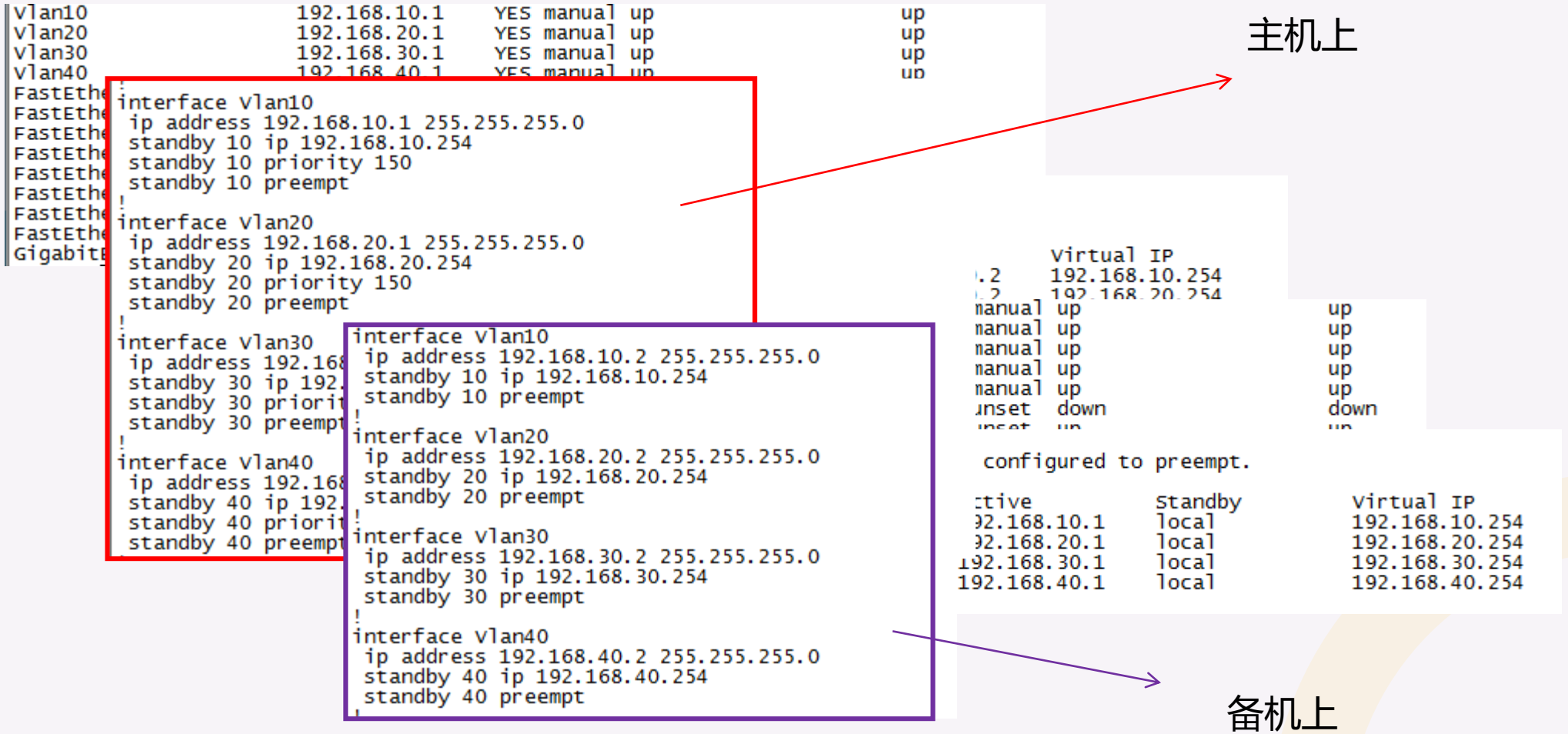
Management接口配置



交换机串口配置

```
!
interface FastEthernet0/1
 no switchport
 ip address 210.33.44.2 255.255.255.0
!
interface FastEthernet0/2
!
interface FastEthernet0/3
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface FastEthernet0/4
!
interface FastEthernet0/5
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
```

HSRP协议配置


Vlan10 192.168.10.1 YES manual up up
Vlan20 192.168.20.1 YES manual up up
Vlan30 192.168.30.1 YES manual up up
Vlan40 192.168.40.1 YES manual up up
interface Vlan10
ip address 192.168.10.1 255.255.255.0
standby 10 ip 192.168.10.254
standby 10 priority 150
standby 10 preempt
!
interface Vlan20
ip address 192.168.20.1 255.255.255.0
standby 20 ip 192.168.20.254
standby 20 priority 150
standby 20 preempt
!
interface Vlan30
interface Vlan40
interface Vlan10
ip address 192.168.10.2 255.255.255.0
standby 10 ip 192.168.10.254
standby 10 preempt
!
interface Vlan20
ip address 192.168.20.2 255.255.255.0
standby 20 ip 192.168.20.254
standby 20 preempt
!
interface Vlan30
ip address 192.168.30.2 255.255.255.0
standby 30 ip 192.168.30.254
standby 30 preempt
!
interface Vlan40
ip address 192.168.40.2 255.255.255.0
standby 40 ip 192.168.40.254
standby 40 preempt
Virtual IP
192.168.10.254
manual up up
manual up up
manual up up
manual up up
manual up up
unset down down
configured to preempt.
Standby Virtual IP
local 192.168.10.254
local 192.168.20.254
local 192.168.30.254
local 192.168.40.254
主机上
备机上

04

•实验结果

AP接入结果


wlan_yjk
忘记网络
静态IP
IP 地址
192.168.30.103
网关
192.168.30.254
网络掩码
255.255.255.0
DNS 1
114.114.114.114
DNS 2
8.8.8.8
手动代理

客户机ping移动设备

```
C:\Users\Administrator>ping 192.168.30.103

正在 Ping 192.168.30.103 具有 32 字节的数据:
来自 192.168.30.103 的回复: 字节=32 时间=35ms TTL=64
来自 192.168.30.103 的回复: 字节=32 时间=8ms TTL=64
来自 192.168.30.103 的回复: 字节=32 时间=4ms TTL=64
来自 192.168.30.103 的回复: 字节=32 时间=19ms TTL=64

192.168.30.103 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
往返行程的估计时间(以毫秒为单位):
    最短 = 4ms, 最长 = 35ms, 平均 = 16ms
```

实验结果

总部Aping
不通
LAPTOP

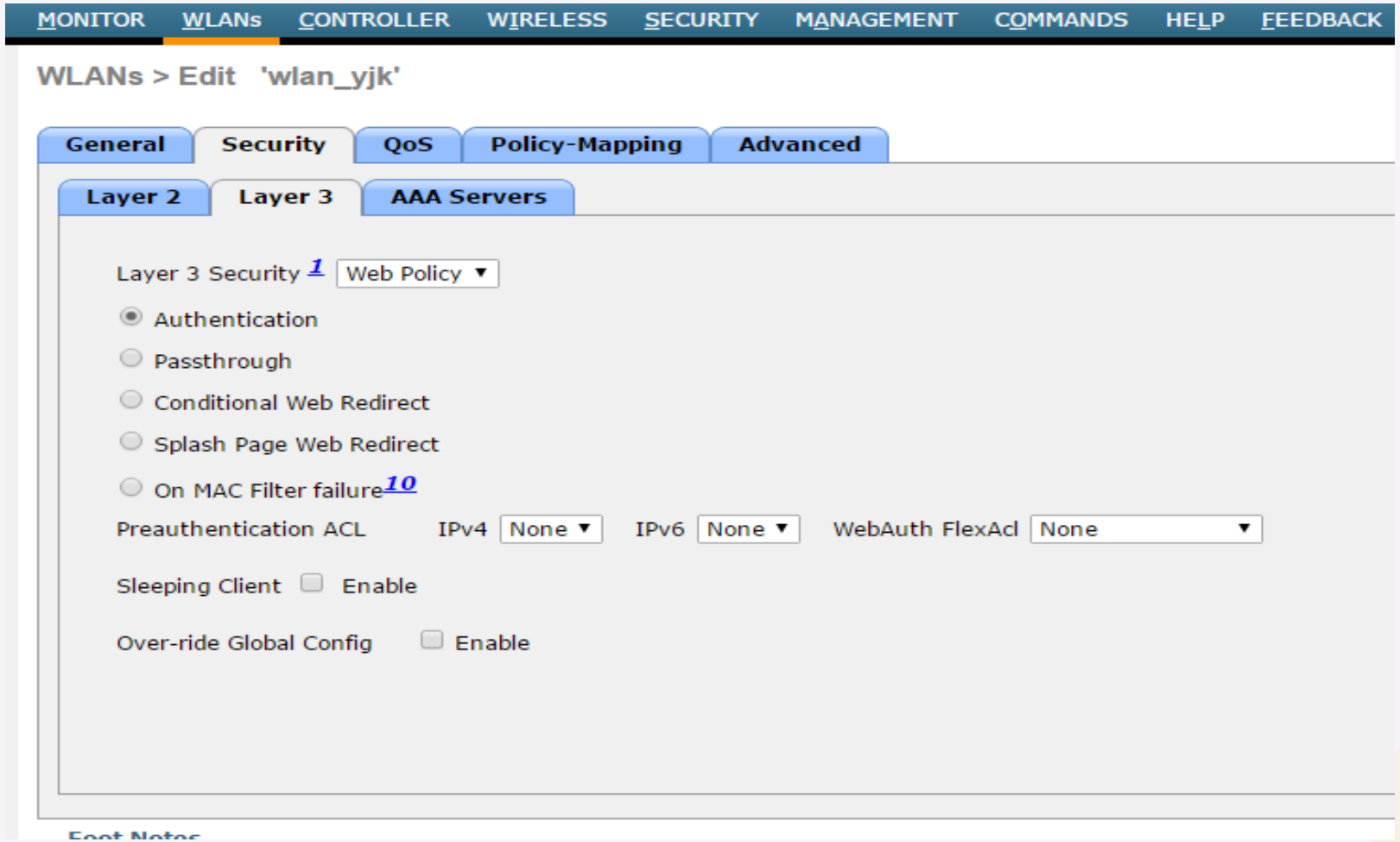
```
C:\Users\Administrator>ping 192.168.30.103

正在 Ping 192.168.30.103 具有 32 字节的数据:
请求超时。
请求超时。
请求超时。
请求超时。

192.168.30.103 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 0, 丢失 = 4 (100% 丢失),
```

总部 Aping
通分支机构

```
C:\Users\Administrator>ping 192.168.1.1

正在 Ping 192.168.1.1 具有 32 字节的数据:
来自 192.168.1.1 的回复: 字节=32 时间=13ms TTL=253
来自 192.168.1.1 的回复: 字节=32 时间=9ms TTL=253
来自 192.168.1.1 的回复: 字节=32 时间=9ms TTL=253
来自 192.168.1.1 的回复: 字节=32 时间=9ms TTL=253

192.168.1.1 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
往返行程的估计时间(以毫秒为单位):
    最短 = 9ms, 最长 = 13ms, 平均 = 10ms
```

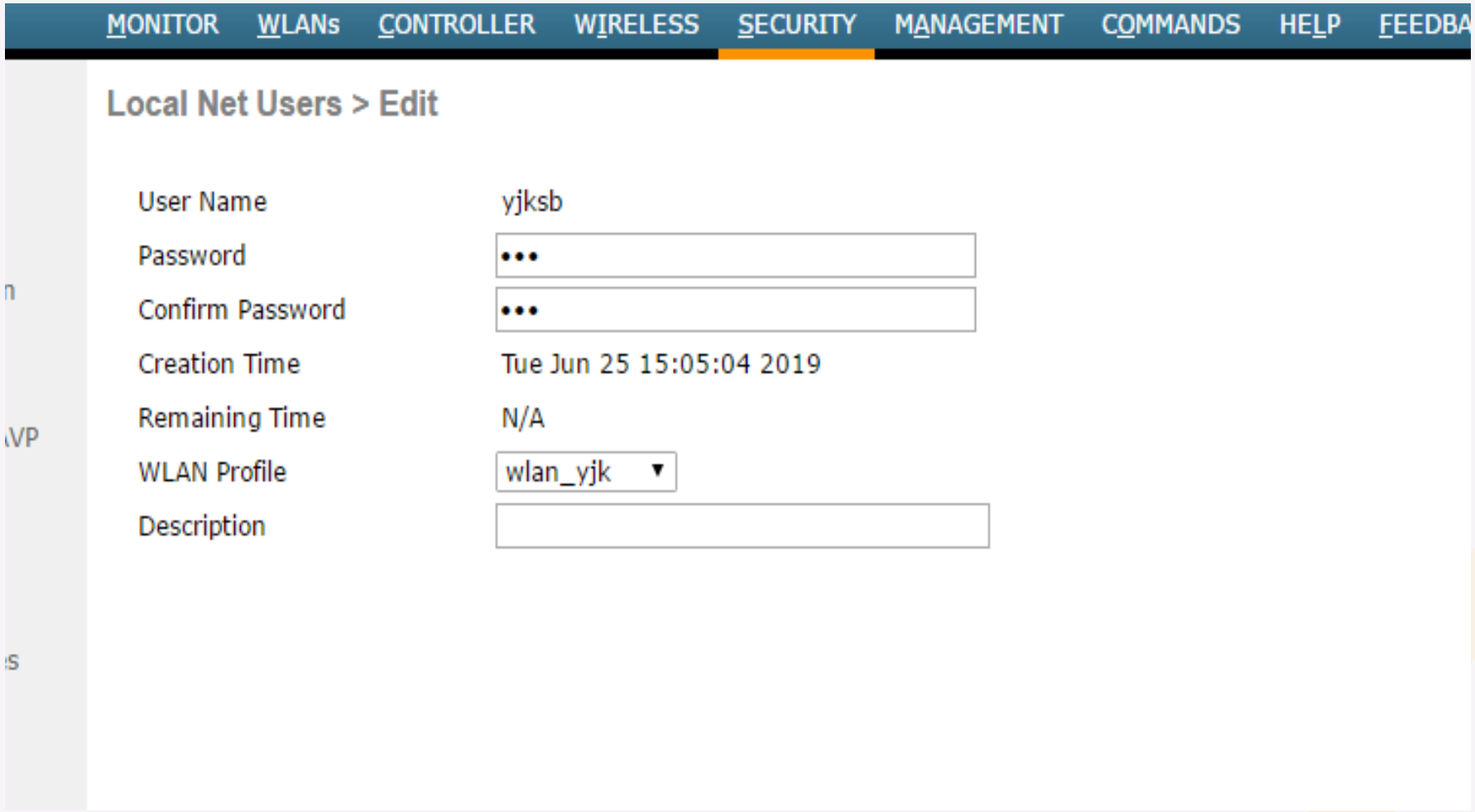
实验结果

配置wlan需要登录账号才能进入



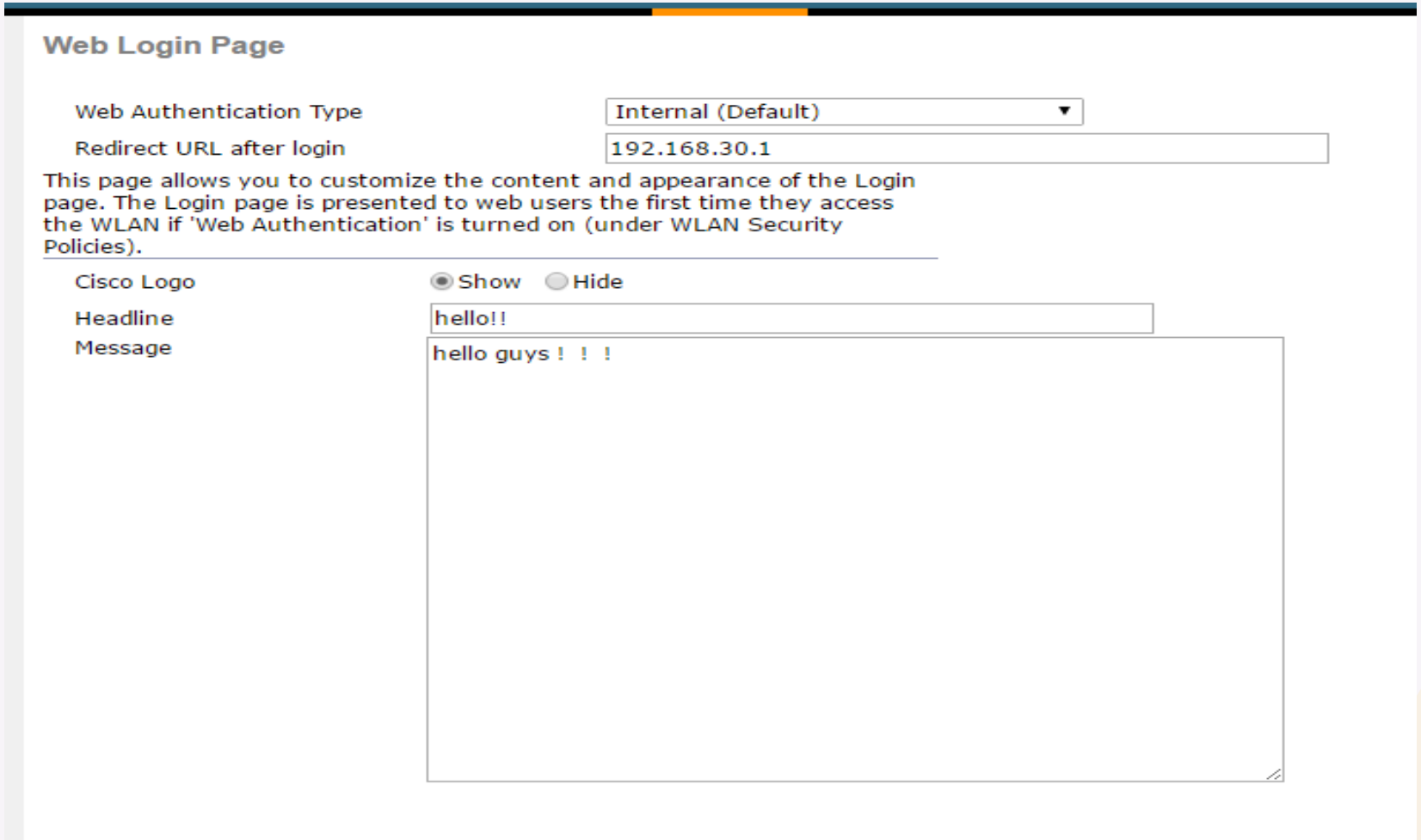
实验结果

配置本地用户


MONITOR
WLANs
CONTROLLER
WIRELESS
SECURITY
MANAGEMENT
COMMANDS
HELP
FEEDBA
Local Net Users > Edit
User Name
yjksb
Password
Confirm Password
Creation Time
Tue Jun 25 15:05:04 2019
Remaining Time
N/A
WLAN Profile
wlan_yjk
Description

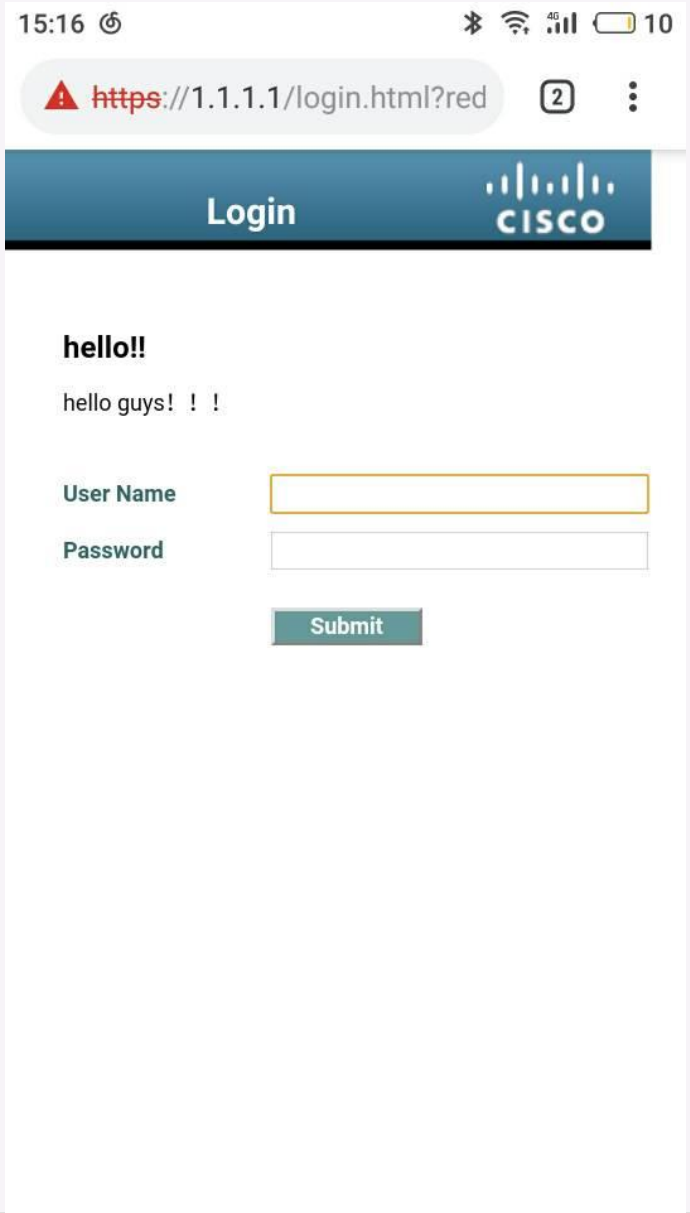
实验结果

配置登录页面


Web Login Page
Web Authentication Type
Internal (Default)
Redirect URL after login
192.168.30.1
This page allows you to customize the content and appearance of the Login page. The Login page is presented to web users the first time they access the WLAN if 'Web Authentication' is turned on (under WLAN Security Policies).
Cisco Logo
Show
Hide
Headline
hello!!
Message
hello guys ! ! !

实验结果

Web认证


15:16
10
https://1.1.1.1/login.html?red
2
Login
CISCO
hello!!
hello guys！！！
User Name
Password
Submit

05

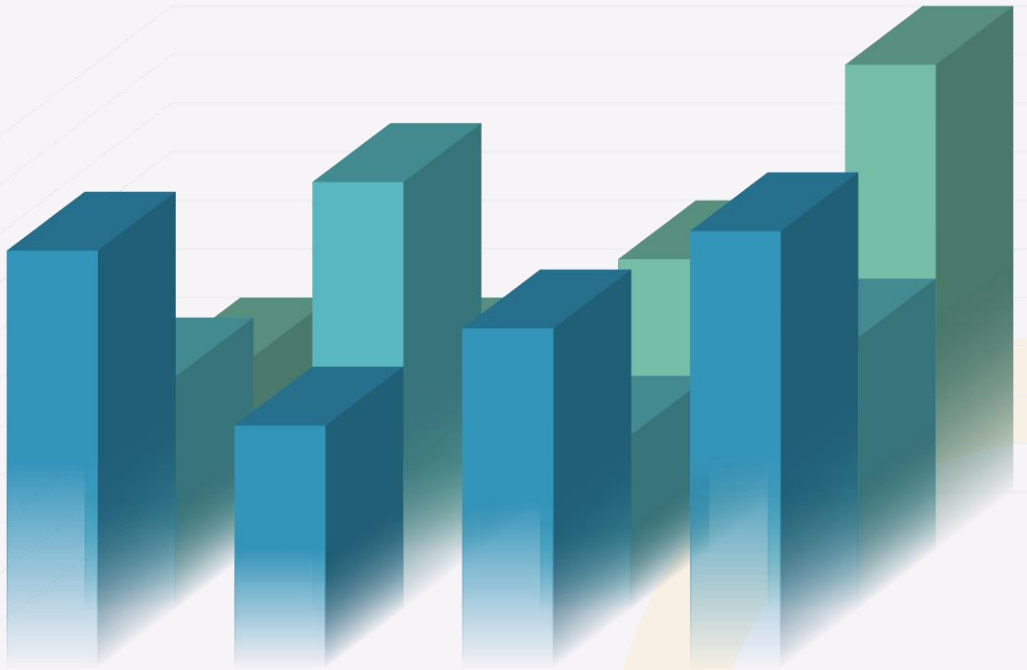
•实践感想

实践感想

本次实验涉及了相当一部分的无线知识，而关于无线这一部分的内容，我们不够了解，因此配置WLC算是我们组内的一大难题，耗费了挺多时间去配置设备的。

另外，由于拓扑图的绘制和真机有一定的出入，在配置接口的时候需要同真机进行对比，花费了不少时间。

除此之外，最后一个要求需要用到两个AP，但由于设备的限制，我们不能尽善尽美地完成这一部分。



THANK U

感谢聆听