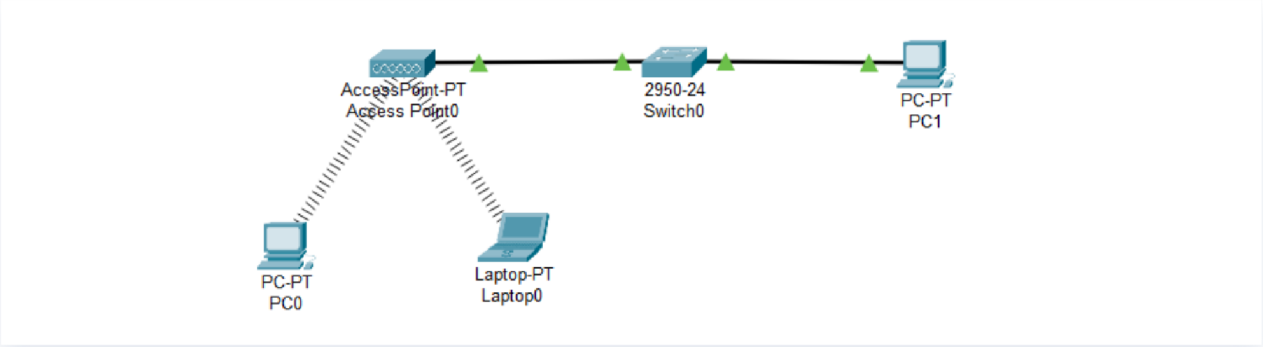
实验三 无线局域网组网实验

实验目的：

- 无线局域网基本组网
- 无线局域网扩展组网

3.1 无线局域网基本组网实验

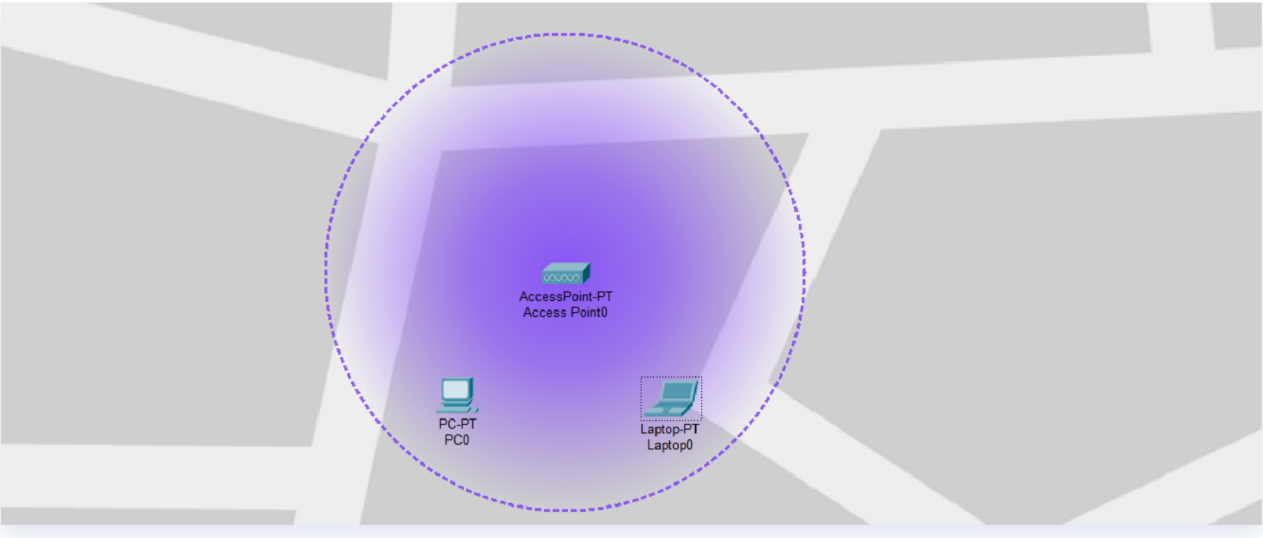
网络拓扑



实验步骤

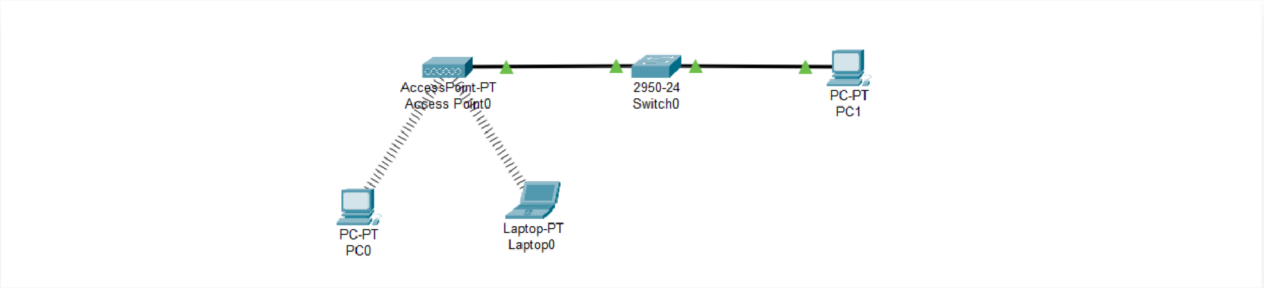
物理工作区设备部署

在软件中建立相应拓扑图，首先设置无线接入点的**SSID和密码**。替换好终端设备的有线网卡为无线网卡之后，输入连接的SSID和密码。开启**DHCP服务**自动分配IP，在获取IP之后测试网络中设备的连通性。



```
C:\>ping 169.254.87.152

Pinging 169.254.87.152 with 32 bytes of data:

Reply from 169.254.87.152: bytes=32 time=50ms TTL=128
Reply from 169.254.87.152: bytes=32 time=26ms TTL=128
Reply from 169.254.87.152: bytes=32 time=26ms TTL=128
Reply from 169.254.87.152: bytes=32 time=18ms TTL=128

Ping statistics for 169.254.87.152:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 18ms, Maximum = 50ms, Average = 30ms
```

拓展局域网

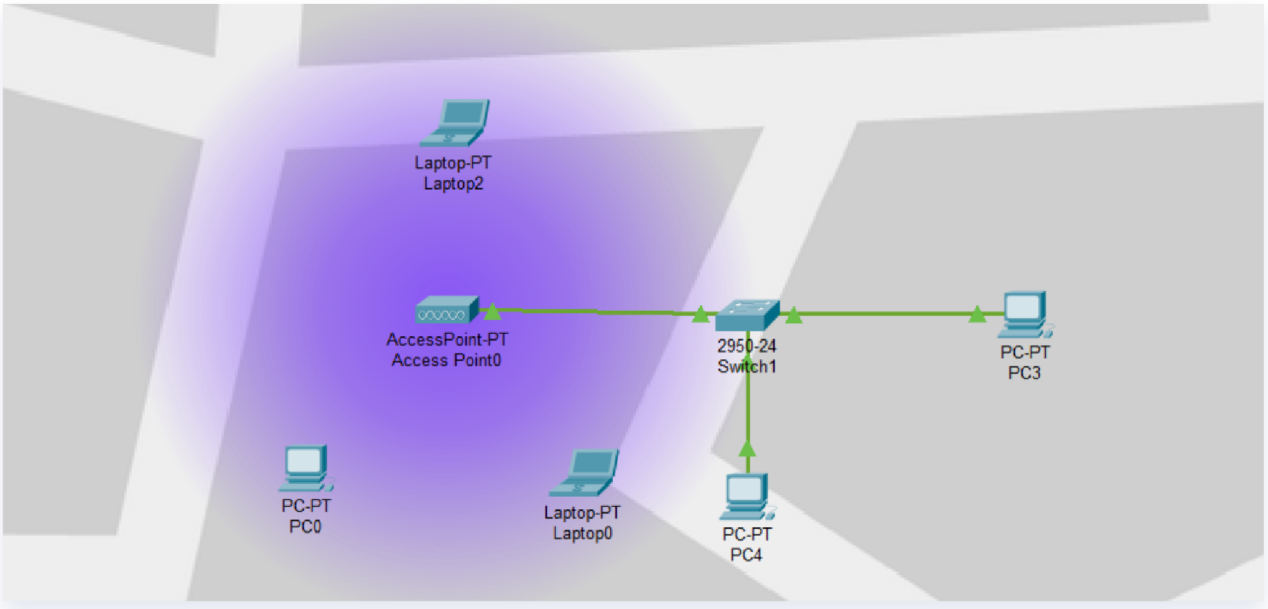


添加交换机并在交换机侧添加新设备PC1，设置静态地址为192.168.1.3/24。此时会发现彼此之间无法互通，只有在无线局域网下的两台设备可以通讯。

重新设置无线局域网下的两台设备，将DHCP改为静态IP并设置192.168.1.1/24和192.168.1.2/24。发现此时三台设备可以互通。

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=38ms TTL=128
Reply from 192.168.1.3: bytes=32 time=16ms TTL=128
Reply from 192.168.1.3: bytes=32 time=17ms TTL=128
Reply from 192.168.1.3: bytes=32 time=12ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 12ms, Maximum = 38ms, Average = 20ms
```

实验提升

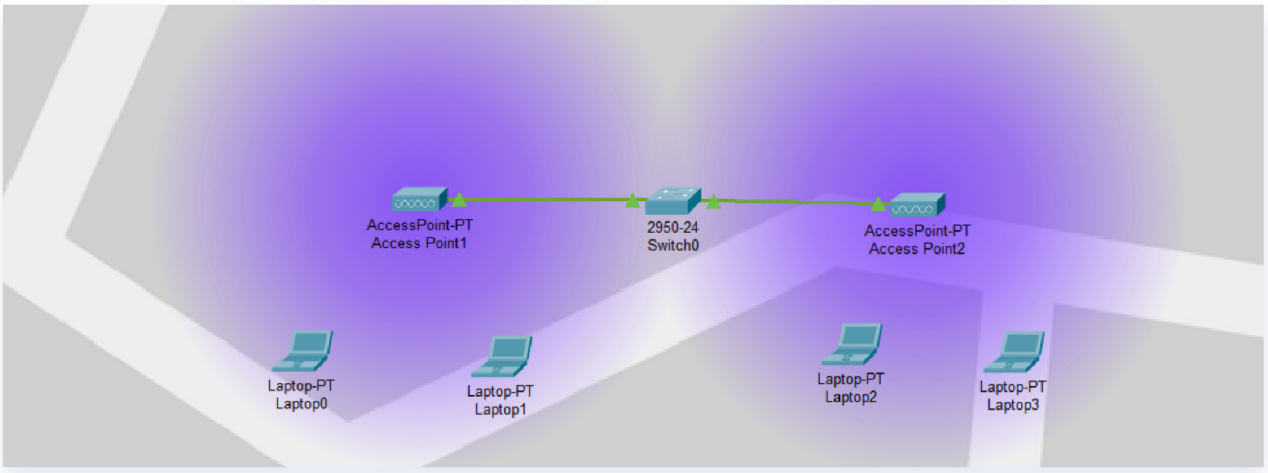



```
C:\>ping 192.168.1.5

Pinging 192.168.1.5 with 32 bytes of data:

Reply from 192.168.1.5: bytes=32 time=40ms TTL=128
Reply from 192.168.1.5: bytes=32 time=18ms TTL=128
Reply from 192.168.1.5: bytes=32 time=21ms TTL=128
Reply from 192.168.1.5: bytes=32 time=27ms TTL=128

Ping statistics for 192.168.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 18ms, Maximum = 40ms, Average = 26ms
```

3.2 无线局域网扩展组网实验

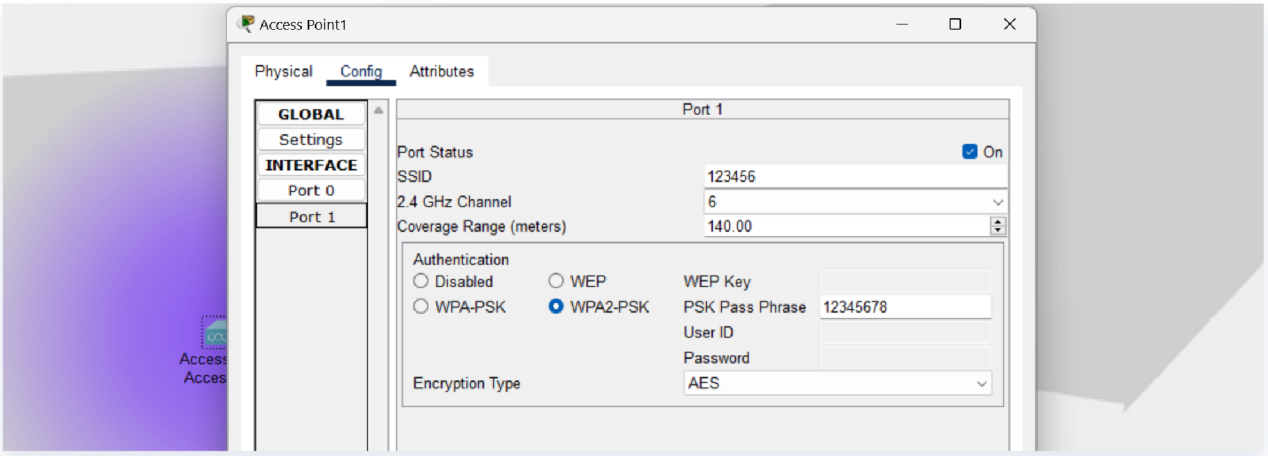
实验拓扑

首先建立两台AP设备，一台交换机和四台无线上网笔记本电脑组成的网络。



实验步骤

AP设置



检查连通性

此时没有设置终端设备的IP地址，默认选择DHCP自动获取IP。

```
C:\>ipconfig

Wireless0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::201:97FF:FEC8:84DD
   IPv6 Address.....: ::
   Autoconfiguration IPv4 Address..: 169.254.132.221
   Subnet Mask.....: 255.255.0.0
   Default Gateway.....: ::
                                0.0.0.0
```

这里可以看见IP为 169.254.132.221，使用其他设备测试连接。

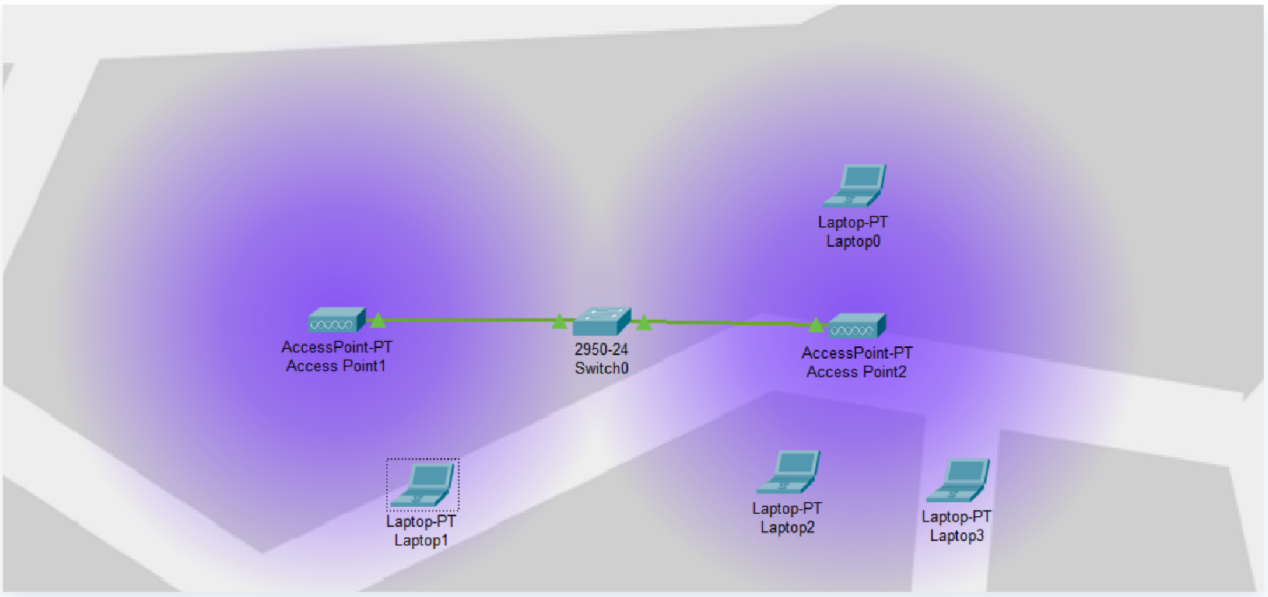
```
C:\>ping 169.254.132.221

Pinging 169.254.132.221 with 32 bytes of data:

Reply from 169.254.132.221: bytes=32 time=46ms TTL=128
Reply from 169.254.132.221: bytes=32 time=30ms TTL=128
Reply from 169.254.132.221: bytes=32 time=31ms TTL=128
Reply from 169.254.132.221: bytes=32 time=25ms TTL=128

Ping statistics for 169.254.132.221:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 25ms, Maximum = 46ms, Average = 33ms
```

设置静态IP

```
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=45ms TTL=128
Reply from 192.168.1.3: bytes=32 time=32ms TTL=128
Reply from 192.168.1.3: bytes=32 time=25ms TTL=128
Reply from 192.168.1.3: bytes=32 time=23ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 23ms, Maximum = 45ms, Average = 31ms
```

不同BSS之间漫游

将其中一台笔记本从一台AP节点的作用区域拖入另一台AP节点的作用区域，然后测试连通性。




```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=54ms TTL=128
Reply from 192.168.1.1: bytes=32 time=29ms TTL=128
Reply from 192.168.1.1: bytes=32 time=31ms TTL=128
Reply from 192.168.1.1: bytes=32 time=20ms TTL=128

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 54ms, Average = 33ms
```

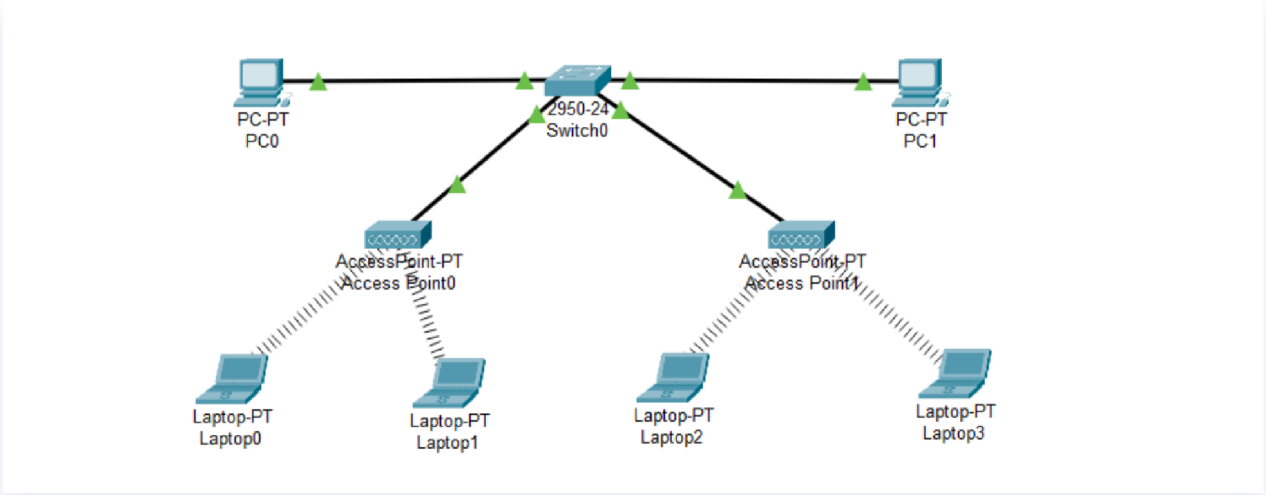
不同SSID下

将第二个AP的SSID更改为1234567，发现通过第一个AP的设备无法与第二个AP的设备通信。

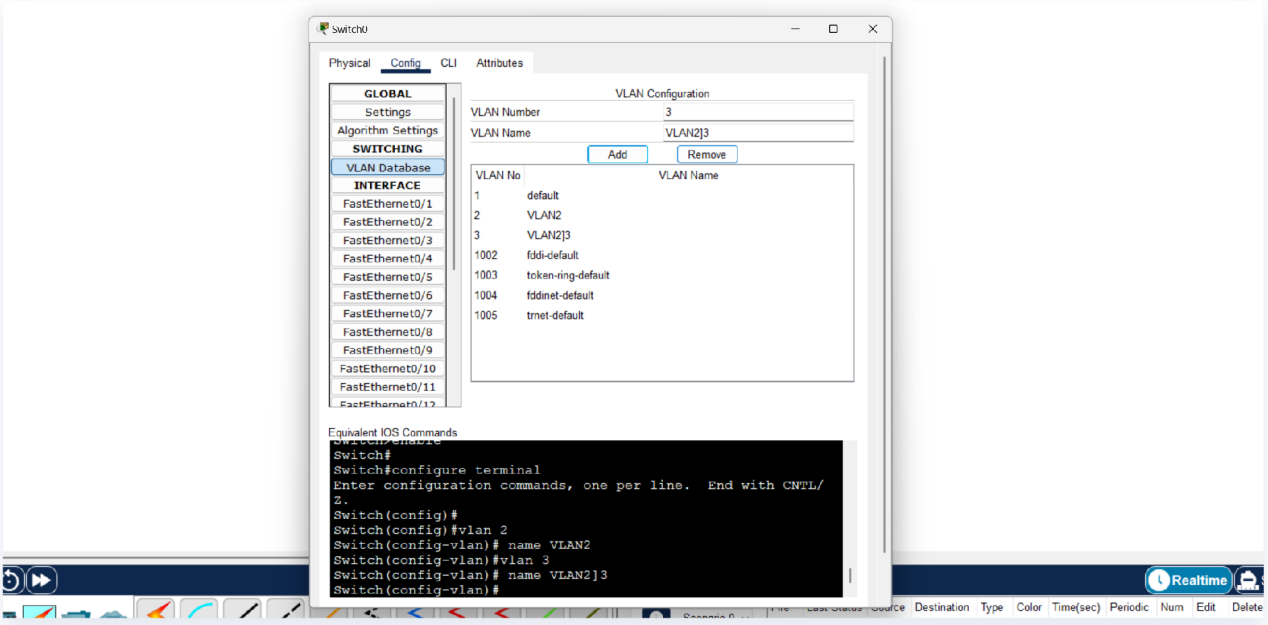
```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

实验提升

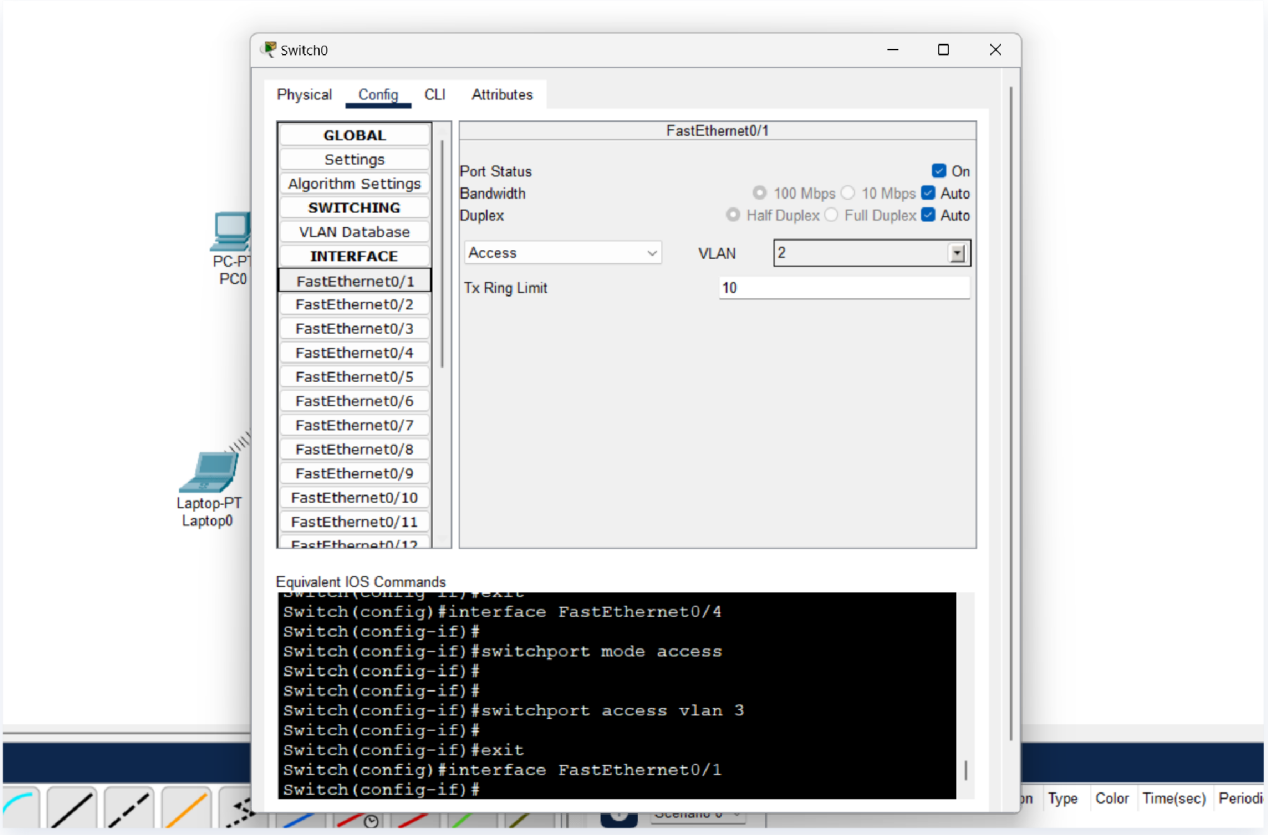
建立实验拓扑图。



建立VLAN



分配端口到不同VLAN



将1与3分配到VLAN2，2与4分配到VLAN3

测试连通性

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=11ms TTL=128
Reply from 192.168.1.1: bytes=32 time=12ms TTL=128
Reply from 192.168.1.1: bytes=32 time=13ms TTL=128
Reply from 192.168.1.1: bytes=32 time=14ms TTL=128

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 11ms, Maximum = 14ms, Average = 12ms

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

测试结果得到只有同一个VLAN下才可以通信。