

# 无线网络组网实验

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# WIFI介绍

无线保真（外语缩写：WIFI、外语全称：Wireless Fidelity），是当今使用最广的一种无线网络传输技术。实际上就是把有线网络信号转换成无线信号，供支持其技术的相关电脑，手机，PDA等接收。手机如果有WIFI功能的话，在有WIFI无线信号的时候就可以不通过移动联通的网络上网，省掉了流量费。

WIFI无线网络在无线局域网的范畴是指“无线相容性认证”，实质上是一种商业认证，同时也是一种无线联网技术，以前通过网线连接电脑，而无线保真则是通过无线电波来连网。

# WIFI介绍

常见的就是一个无线路由器，那么在这个无线路由器的电波覆盖的有效范围都可以采用无线保真连接方式进行联网，如果无线路由器连接了上网线路，则又被称为热点。

Wi-Fi是一个无线网络通信技术的品牌，由Wi-Fi联盟（Wi-Fi Alliance）所持有。目的是改善基于IEEE802.11标准的无线网络产品之间的互通性。有人把使用IEEE 802.11系列协议的局域网就称为无线保真。甚至把无线保真等同于无线网际网路（Wi-Fi是WLAN的重要组成）。

# WIFI主要组成

WIFIWIFI一般架设无线网络的基本配备就是无线网卡及一台AP，如此便能以无线的模式，配合既有的有线架构来分享网络资源，架设费用和复杂程度远远低于传统的有线网络。如果只是几台电脑的对等网，也可不要AP，只需要每台电脑配备无线网卡。AP为Access Point简称，一般翻译为“无线访问接入点”，或“桥接器”。它主要在媒体存取控制层MAC中扮演无线工作站及有线局域网络的桥梁。



# WIFI主要协议

WIFI主要协议是IEEE802.11

IEEE802.11定义了系统应该提供的服务Service）。属于分配系统的任务，分别为，联接（Association），结束联接（Disassociation），分配（Distribution），集成（Integration），再联接（Reassociation）。

属于站点的任务，分别为，鉴权（Authentication），结束鉴权（Deauthentication），隐私（Privacy），MAC数据传输（MSDU delivery）。

# WIFI主要协议

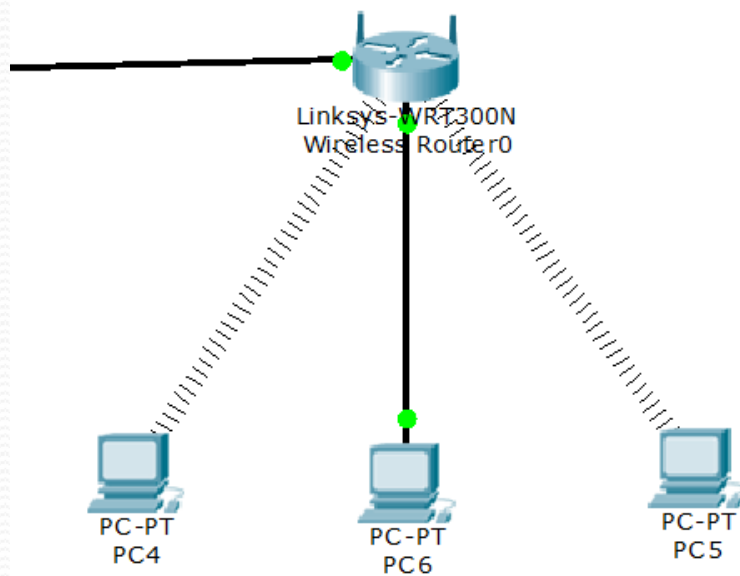
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# 简单WIFI路由器设置

## WRT300N无线路由器及电脑



# 简单WIFI路由器设置

路由器的主要配置:

The screenshot displays the configuration window for a device named 'Wireless Router0'. The window has three tabs: 'Physical', 'Config', and 'GUI'. The 'Config' tab is active, showing a sidebar with categories: 'GLOBAL' (containing 'Settings' and 'Algorithm Settings') and 'INTERFACE' (containing 'Internet', 'LAN', and 'Wireless'). The 'Internet' option is selected, leading to the 'Internet Settings' page. This page includes a 'Connection Type' section with three radio buttons: 'DHCP' (selected), 'Static', and 'PPPoE'. Below this, there are input fields for 'Default Gateway' (192.168.2.1), 'IP Address' (192.168.2.11), 'Subnet Mask' (255.255.255.0), 'DNS Server' (192.168.2.2), 'UserName', and 'Password'.

Wireless Router0

Physical Config GUI

GLOBAL

Settings

Algorithm Settings

INTERFACE

Internet

LAN

Wireless

Internet Settings

Connection Type:

☒ DHCP

☐ Static

☐ PPPoE

Default Gateway 192.168.2.1

IP Address 192.168.2.11

Subnet Mask 255.255.255.0

DNS Server 192.168.2.2

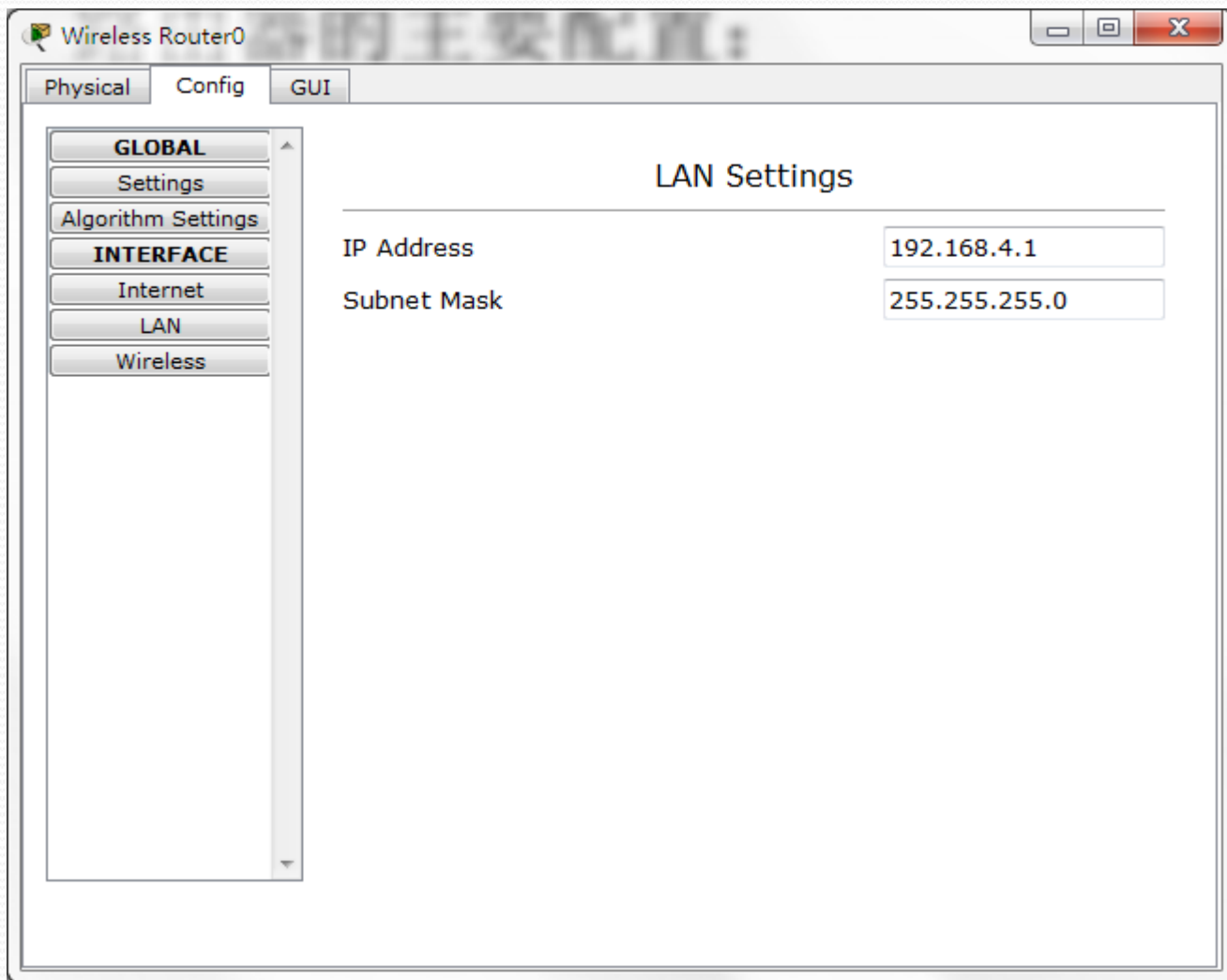
UserName

Password



# 简单WIFI路由器设置

路由器的主要配置:



# 简单WIFI路由器设置

路由器的主要配置:

The screenshot displays a web-based configuration interface for a 'Wireless Router0'. The interface has three main tabs at the top: 'Physical', 'Config', and 'GUI'. The 'Config' tab is active, and within it, the 'Wireless' sub-tab is selected. On the left side of the 'Config' tab, there is a vertical menu with options: 'GLOBAL', 'Settings', 'Algorithm Settings', 'INTERFACE', 'Internet', 'LAN', and 'Wireless'. The main content area is titled 'Wireless Settings' and contains the following fields and options:

- SSID:** A text input field containing 'TestWifi'.
- Channel:** A dropdown menu currently set to '1'.
- Authentication:** A section with two columns of radio button options:
  - Left column: ☒ Disabled, ☐ WPA-PSK, ☐ WPA.
  - Right column: ☐ WEP, ☐ WPA2-PSK, ☐ WPA2.
- Key:** A text input field, currently empty.
- Pass Phrase:** A text input field, currently empty.
- RADIUS Server Settings:** A section with two text input fields:
  - IP Address:** Currently empty.
  - Shared Secret:** Currently empty.
- Encryption Type:** A dropdown menu currently set to 'Disabled'.

# 简单WIFI路由器设置

路由器的主要配置:

The screenshot displays the Linksys WRT300N router's web-based configuration interface. The top navigation bar includes tabs for Physical, Config, and GUI. The main content area is divided into two primary sections: Internet Setup and Network Setup.

**Internet Setup:**

- Internet Connection type:** Set to "Automatic Configuration - DHCP".
- Optional Settings (required by some internet service providers):**
  - Host Name:** Text input field.
  - Domain Name:** Text input field.
  - MTU:** Dropdown menu.
  - Size:** Text input field with value "1500".

**Network Setup:**

- Router IP:** IP Address: 192.168.4.1, Subnet Mask: 255.255.255.0.
- DHCP Server Settings:**
  - DHCP Server:** Radio buttons for "Enabled" (selected) and "Disabled". A "DHCP Reservation" button is also present.
  - Start IP Address:** 192.168.4.100.
  - Maximum number of Users:** 50.
  - IP Address Range:** 192.168.4.100 - 149.
  - Client Lease Time:** 0 minutes (0 means one day).
  - Static DNS 1:** 0.0.0.0.

# 简单WIFI路由器设置

路由器的主要配置:

The screenshot displays the configuration interface for a Linksys WRT300N router. The top navigation bar includes tabs for Physical, Config, and GUI. The main menu on the left lists various settings: Wireless, Setup, Wireless, Security, Access Restrictions, Applications & Gaming, Administration, and Status. The 'Wireless' section is currently selected, and the 'Basic Wireless Settings' sub-tab is active. The settings are as follows:

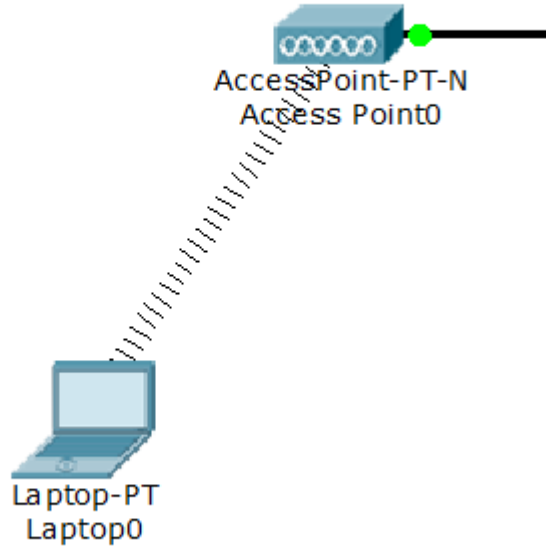
| Setting              | Value   |
|----------------------|---|
| Network Mode:        | Mixed   |
| Network Name (SSID): | TestWifi  |
| Radio Band:          | Auto  |
| Wide Channel:        | Auto  |
| Standard Channel:    | 1 - 2.412GHz  |
| SSID Broadcast:      | <input checked="" type="radio"/> Enabled <input type="radio"/> Disabled |

At the bottom of the configuration page, there are two buttons: 'Save Settings' and 'Cancel Changes'. The Cisco Systems logo is visible in the bottom right corner.



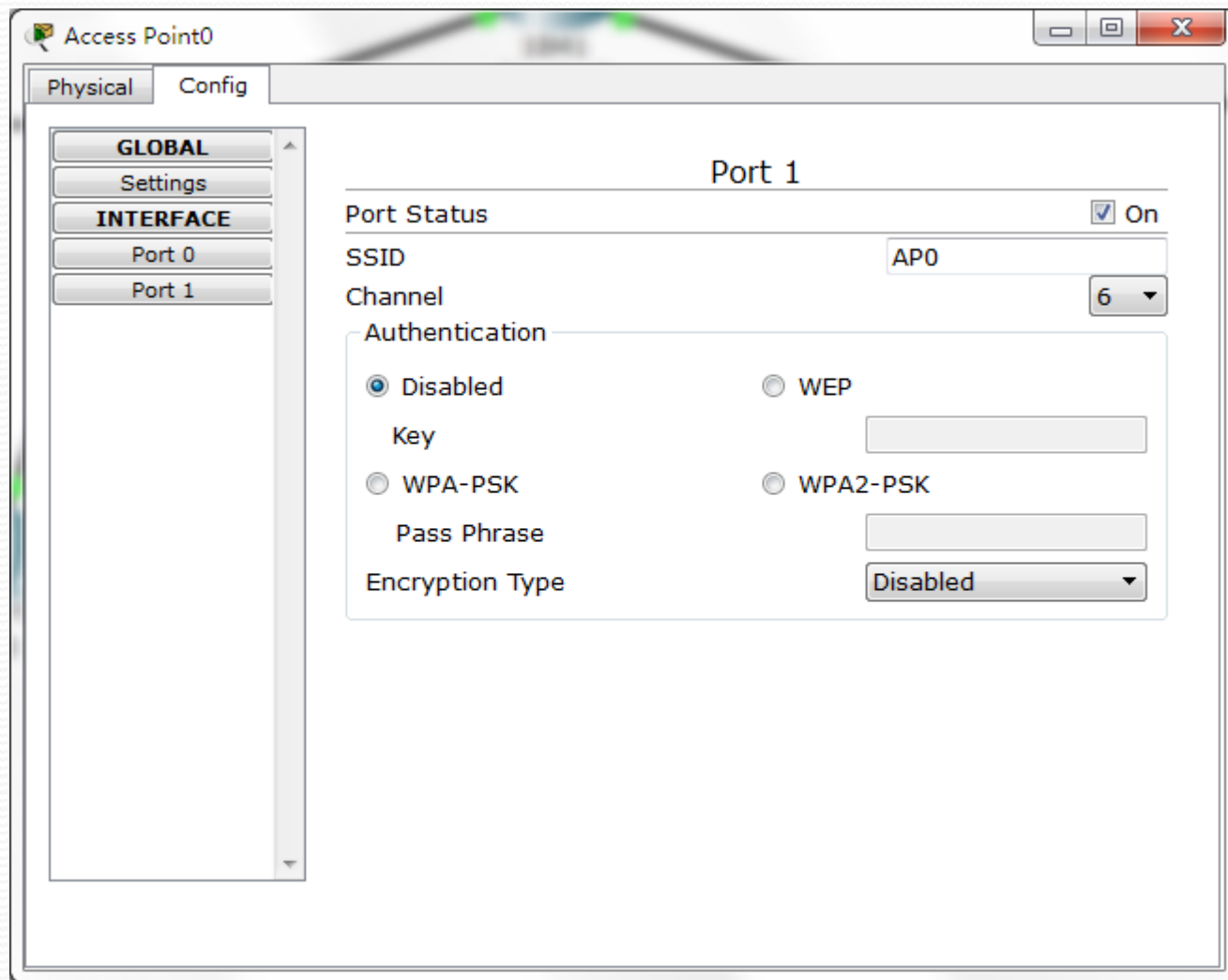
# 简单AP接入点设置

## AP接入点及电脑



# 简单AP接入点设置

AP接入点主要配置:

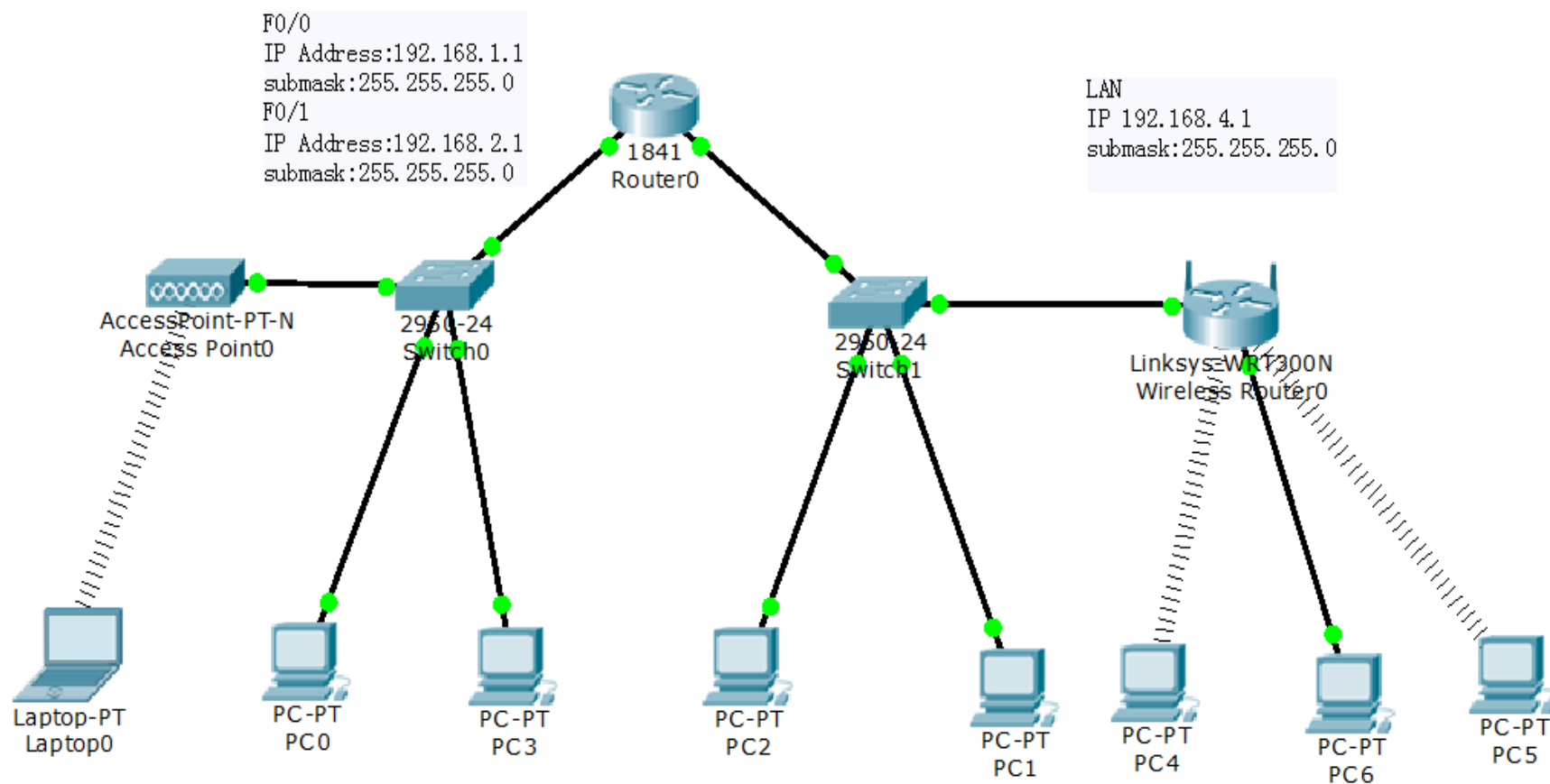


# WIFI组网步骤

- 1 首先规划网络地址及 拓扑图；
- 2 配置路由器口IP地址；
- 3 配置DHCP；
- 4 验证主机之间的互通性。

# 示例

- 网络拓扑及地址规划





# 实验过程：

- (1) 配置好无线路由器和接入点AP;
- (2) 配置路由器的端口地址;
- (3) 配置有关DHCP;

路由器接口地址配置：

```
interface FastEthernet0/0
```

```
ip address 192.168.1.1 255.255.255.0
```

```
interface FastEthernet0/1
```

```
ip address 192.168.2.1 255.255.255.0
```

注意：端口要no shutdown

# 路由器的主要配置（1）

路由器DHCP左边网络

```
ip dhcp excluded-address 192.168.1.0 192.168.1.10
```

```
ip dhcp pool myleftnet
```

```
network 192.168.1.0 255.255.255.0
```

```
default-router 192.168.1.1
```

```
option 150 ip 192.168.1.3
```

```
dns-server 192.168.1.2
```

# 路由器的主要配置（2）

路由器DHCP右边网络

```
ip dhcp excluded-address 192.168.2.0 192.168.2.10
```

```
ip dhcp pool myrightnet
```

```
network 192.168.2.0 255.255.255.0
```

```
default-router 192.168.2.1
```

```
option 150 ip 192.168.2.3
```

```
dns-server 192.168.2.2
```

# 问题

- 1配置无线路由器相关密码进行测试;
- 2观测各个PC终端连通情况（ping测试）。
- 3如果在接入一台路由器如何配置。
- 4如果改为静态IP地址如何处理？