

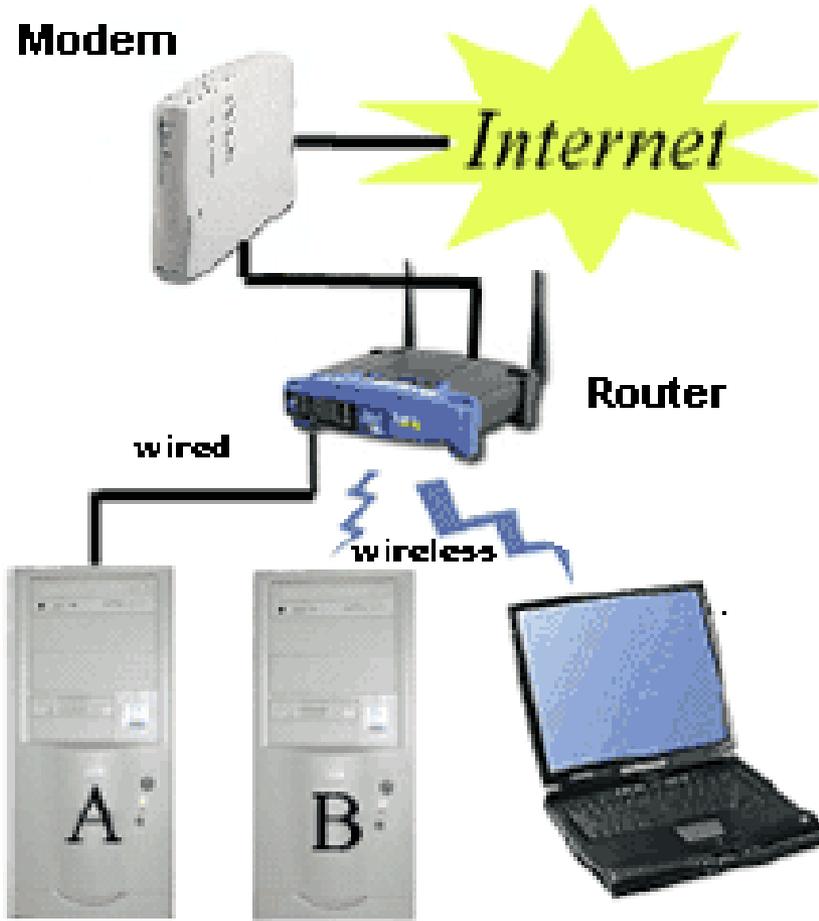
THE 123 OF WIRELESS SECURITY AT HOME/SOHO 家居WIFI 保安 123

CONFIGURING YOUR HOME WIRELESS NETWORK



Presented by: WTIA & PISA

Home Network



- Internet – ISP
 - ▣ Wire to home
- Modem
 - ▣ Translates electronic data
- Router
 - ▣ Disperses electronic data
- Network Adaptor
 - ▣ Required for each Computer
 - ▣ Wired
 - NIC (network interface card) or ethernet card
 - ▣ Wireless
 - Wireless Adaptor

Functions of a Home Wireless Router

- Router
- Access Point
- Firewall



What is a Router

- Connects one network to another ... Sometimes called a “Gateway”
- Connects your computer to the internet (cable modem or DSL Line) – keeps LAN traffic local
- Routers keep track of IP addresses and physical (MAC) addresses of hosts
 - ▣ IP (Internet Protocol) address ... your computers internet address
 - ▣ MAC (Media Access Control) ... id for each physical communication device

What is an Access Point

- A point where computers access a network
 - ▣ Device which links wireless users to network
 - ▣ Transmits and receives data (Transceiver)
 - ▣ Bridge between wireless and wired networks
- Can be linked together to cover broad area
- No security or firewall implemented
- Wireless Networking Standards
 - ▣ 802.11 a, b, g, n and ac
 - configuration specifications to insure compatibility
 - Different speed/range capabilities
 - ▣ Equipment conforming to “n” and “ac” are most popular/available
 - Good for 100-400 feet ... in a house



What is a Firewall

- A device that filters packets of data or traffic
- Its job is to be a traffic cop
- You configure the firewall:
 - ▣ What will allow to pass
 - ▣ What will it block
- Hides your home network from the outside world
- Can be either in hardware or software
- Most popular routers for home have built in firewall protection

What Does a Firewall do?

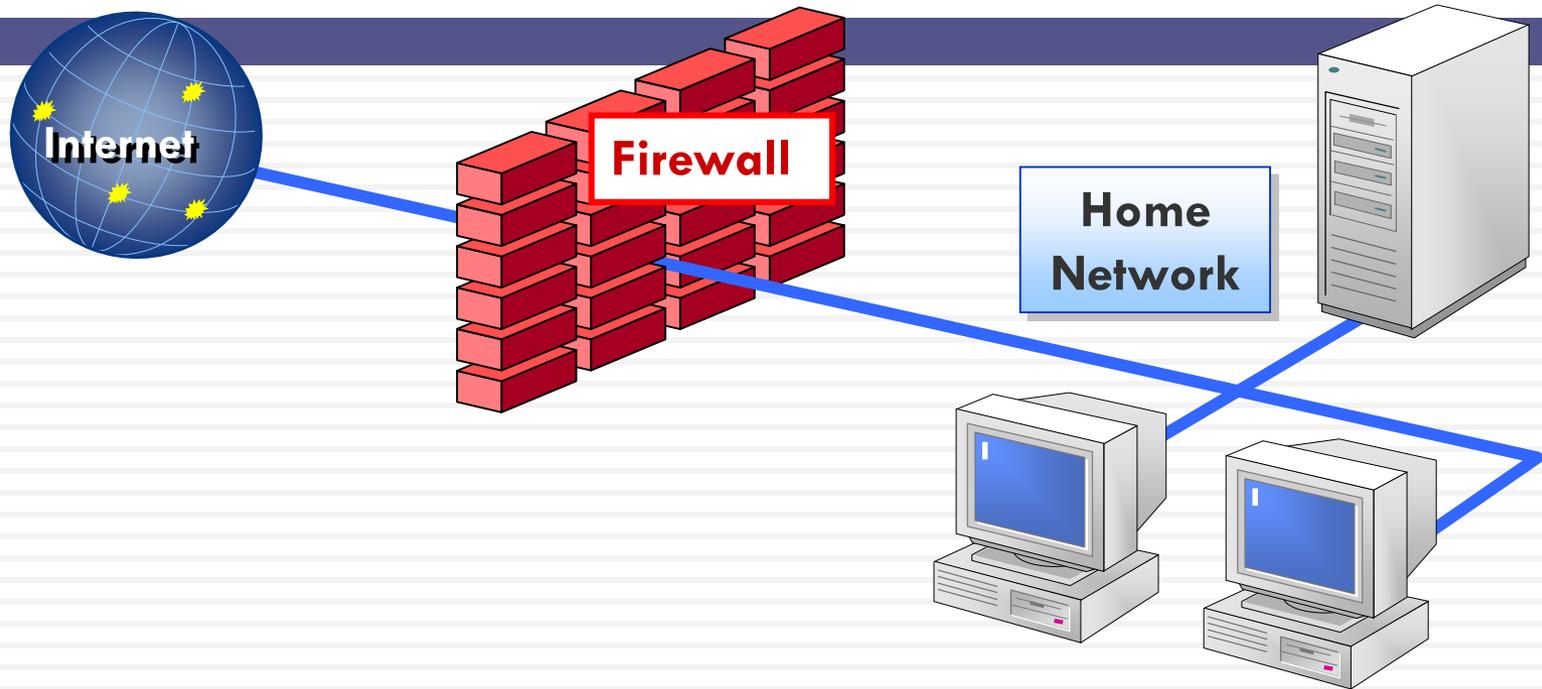
They:

- Protect your home computer from the bad guys
- Keep your information private
- Make you less of a target

By:

- Stopping viruses
- Hiding your computer from the world
- Making the bad guys work harder to get your info

Firewall Protection



1. Checks incoming traffic from the network before it gets to your home network
default – Blocks all Incoming connections
2. Traffic leaving your home network ...
default - Allow all outbound connections
3. Hardware firewalls protect you home network by stop all traffic before it get to your computers
4. Personal software firewall on your computer blocks incoming and outgoing (lets you know what is leaving your computer)

Configure Wireless Firewall/router

Overview

1. **Set Account name and password**

Change name and password ... don't used default

2. **Basic Settings** ... name, internet connection, ip address, etc

Check for firmware updates

3. **Wireless Settings**

SSID broadcast ...

make sure that remote computers are set to automatically connect

Do **NOT** enable DMZ

Do enable ping blocking

4. **Security - Blocking and Filtering**

Wireless Security encryption

MAC filtering

5. **Backup settings**

Account Name

- Change name
 - ▣ Default name is set by manufacturer ... eg, Belkin54
 - ▣ Bad guys know defaults and default administrative passwords
- Create Administrative Password
 - ▣ Use Strong Password
- Record your password where you can find it so you can make changes

Default Info

- Router default info is easily available on internet for consumers ... and the bad guys
 - eg
 - <http://www.otosoftware.com/wwhelp/Default Router Usernames and Passwords.htm>
 - <http://forum.pcmec.com/showthread.php?t=64258>
 - <http://www.defaultpassword.com>
- So Change Name and Password

<i>Mfg</i>	<i>Default IP</i>	<i>User Name</i>	<i>Password</i>
Belkin	192.168.2.1	admin	blank
D-link	192.168.0.1	admin	blank
Linksys	192.168.1.1	blank	admin
Netgear	192.168.0.1	admin	password

Passwords

Your computer password is the foundation of your computer security

- ❑ No Password = No Security
- ❑ Old Passwords & Same Password = Reduced Security
- ❑ Set and change the “administrator” password on router (and your computer logon)
- ❑ STRONG PASSWORD ... 8 characters
 - ❑ use upper, lower case, numbers and symbols



HOW PASSWORD
LENGTH WINS
THE INTERNET

Passwords 102

Wireless Settings

- SSID - service set identifier
 - ▣ name given to your wireless network, **change** it
 - ▣ Broadcasting this ID makes network visible to PCs in area
 - can **be turned off** so it will not be detected by other PCs in area
 - Be sure to set up your own pc to automatically detect and logon to your WLAN
- DMZ –
 - ▣ allows you to select a PC to access WLAN outside the firewall
 - ▣ **do not enable** unless firewall interferes with some activity
- Ping Blocking - troubleshooting tool
 - ▣ Signal sent and echo received indicates valid ip address
 - ▣ Used by hackers to find active computers
 - ▣ **Enable ping blocking** ... won't send echo back
- WPS ... Wi-Fi Protected Setup
 - ▣ **Disable WPS after use**

Example: SSID Setting



Go to Advanced-> Wireless Settings → Disable SSID Broadcast option



Change the Default Settings

Go to set password-> Change the default password

Security

Blocking and Filtering

- **Encryption** – coding transmissions
 - ▣ Multiple variations, WPA2, WPA & WEP in Wi-Fi
- **WPA2-PSK** ... Wireless Protected Access (Pre-shared key)
 - ▣ Use same password for all computers
 - ▣ Use AES
 - ▣ Best Choice in Home/Soho
- ~~□ **WPA-PSK**~~
 - ~~▣ 2nd Choice (if WPA2 not supported)~~
- ~~□ **WEP** ... Wired equivalent privacy~~
 - ~~▣ 64 or 128 bit encryption ...~~
 - ~~▣ Never never use this~~

Example: Authentication and Encryption

The screenshot displays the Netgear SmartWizard router manager interface for a Wireless-G Router (model WGR614v9). The interface is divided into a left sidebar and a main content area. The sidebar contains a navigation menu with categories: Setup Wizard, Setup (Basic Settings, Wireless Settings, Content Filtering, Logs, Block Sites, Block Services, Schedule), Maintenance (Router Status, Attached Devices, Backup Settings, Set Password, Router Upgrade), and Advanced (Wireless Settings, Port Forwarding / Port Triggering, WAN Setup, LAN IP Setup, Dynamic DNS, Static Routes). The 'Wireless Settings' page is active, showing the following configuration options:

- Wireless Network:**
 - Name (SSID): SECUREDNW
 - Region: Europe
 - Channel: Auto
 - Mode: b and g
- Security Options:**
 - None
 - WEP
 - WPA-PSK [TKIP]
 - WPA2-PSK [AES]
 - WPA-PSK [TKIP] + WPA2-PSK [AES]
- Security Options (WPA2-PSK):**
 - Passphrase: securitypwd (8-63 characters or 64 hex digits)

Buttons for 'Apply' and 'Cancel' are located at the bottom of the form.

Go to Wireless Settings

- Authentication-WPA2-PSK
- Cipher type(Encryption)-TKIP or AES
- Pass phrase- Configure the pass phrase (Minimum 8 characters)
- SSID-Change the default SSID

MAC Filtering

- **MAC address** ... Media Access Control address
 - ▣ Unique ID permanently attached to each communication device by manufacturer – hardware id
 - ▣ Can find MAC address (Windows Example):
run → cmd → netsh wlan show interface
- Enter MAC addresses of acceptable network clients
 - ▣ If address is not on filter list, access to network will be denied
- Added Security

Example: MAC Filtering

The screenshot shows the configuration interface for a Wireless-B Broadband Router (model BEFW11S4). The main menu includes 'Wireless', 'Setup', 'Security', 'Applications & Gaming', 'Administration', and 'Status'. The 'Wireless' menu is expanded to show 'Basic Wireless Settings', 'Wireless Security', 'Wireless Network Access', and 'Advanced Wireless Settings'. The 'Wireless Network Access' page is active, showing options to 'Allow All' or 'Restrict Access'. The 'Restrict Access' option is selected. Below this is an 'Access List' with 15 MAC address input fields. The first two fields are empty, while the remaining 13 are filled with '000000000000'. A blue sidebar on the right provides information about the 'Wireless Network Access' screen and includes a 'More...' link.

Wireless-B Broadband Router BEFW11S4

Wireless

Setup Wireless Security Applications & Gaming Administration Status

Basic Wireless Settings Wireless Security Wireless Network Access Advanced Wireless Settings

Wireless Network Access

Allow All

Restrict Access

Access List:

MAC 01:	<input type="text"/>	MAC 11:	<input type="text" value="000000000000"/>
MAC 02:	<input type="text"/>	MAC 12:	<input type="text" value="000000000000"/>
MAC 03:	<input type="text" value="000000000000"/>	MAC 13:	<input type="text" value="000000000000"/>
MAC 04:	<input type="text" value="000000000000"/>	MAC 14:	<input type="text" value="000000000000"/>
MAC 05:	<input type="text" value="000000000000"/>	MAC 15:	<input type="text" value="000000000000"/>

Wireless Network Access

The Wireless Network Access screen is where you can restrict wireless access. The restriction is based on wireless device MAC address. MAC address is a unique 12 digit hexadecimal value given to each network device.

[More...](#)

Check this to restrict access to prescribed MAC ids

Enter allowed MAC ids

To get the MAC address of your Wireless card, Go to "Command Prompt" and type "ipconfig /all" or "netsh wlan show interface"

Extra:

- Enable VPN Virtual Private Network
 - ▣ PPTP server
 - ▣ If available

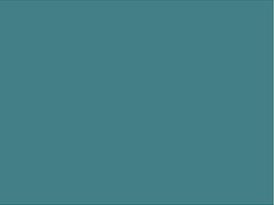
The screenshot shows a web-based configuration interface for a network device. The top navigation bar includes tabs for Setup, Wireless, Services, Security, Access Restrictions, NAT / QoS, and Admin. The 'Services' tab is active, and a sub-menu below it shows options for Services, FreeRadius, PPPoE Server, VPN, USB, NAS, Hotspot, SIP Proxy, and My Ad Network. The 'VPN' sub-tab is selected, leading to the 'PPTP Server' configuration page. The page title is 'PPTP Server'. The configuration options are as follows:

PPTP Server	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Broadcast support	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
MPPE Encryption	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
DNS1	<input type="text"/>
DNS2	<input type="text"/>
WINS1	<input type="text"/>
WINS2	<input type="text"/>
MTU	<input type="text"/> (Default: 1450)
MRU	<input type="text"/> (Default: 1450)
Server IP	<input type="text" value="192.168.11.111"/>
Client IP(s)	<input type="text" value="192.168.11.120,192.168.11.122-140"/>
Authentication	<input type="radio"/> Radius <input checked="" type="radio"/> Local User Management (CHAP Secret)

RECAP- Steps to protect your wireless network



1. Change the default admin password on your router
2. Enable WPA2(AES) on router and wireless workstation
3. Use Strong WPA2-PSK key
4. Update Firmware
5. Disable WPS after use
6. [Added Security] Use MAC address filtering
7. SSID broadcast off
8. Prohibit Peer-to-peer (Ad Hoc) networking
9. [Advanced User] Turn on VPN, if available



Questions

