
HOME WIRELESS SECURITY

JOHN KONG - NOVEMBER 12TH 2013

Let's pretend...



Some Wireless Terms

- * Router - Internet (WAN) port and LAN port(s). Separates two or more networks e.g. separates your network from the internet
- * AP - Access Point - LAN port(s). Extends your network
- * SSID - Wireless network name
- * WPA - Wireless Protected Access. A wireless authentication method
- * WEP - Wireless Equivalent Protocol. A wireless authentication method
- * Passphrase - String of characters used to access wireless network.
- * TKIP /AES - Wireless Encryption Types

How we use wireless

- * Computers
- * Printers
- * SmartPhones
- * Media players
- * TVs
- * Media servers
- * Weather stations
- * Video surveillance
- * Video display
- * Screen-casting
- * NAS
- * SIP phones
- * Audio
- * Projectors
- * Bridges
- * Games
- * ...

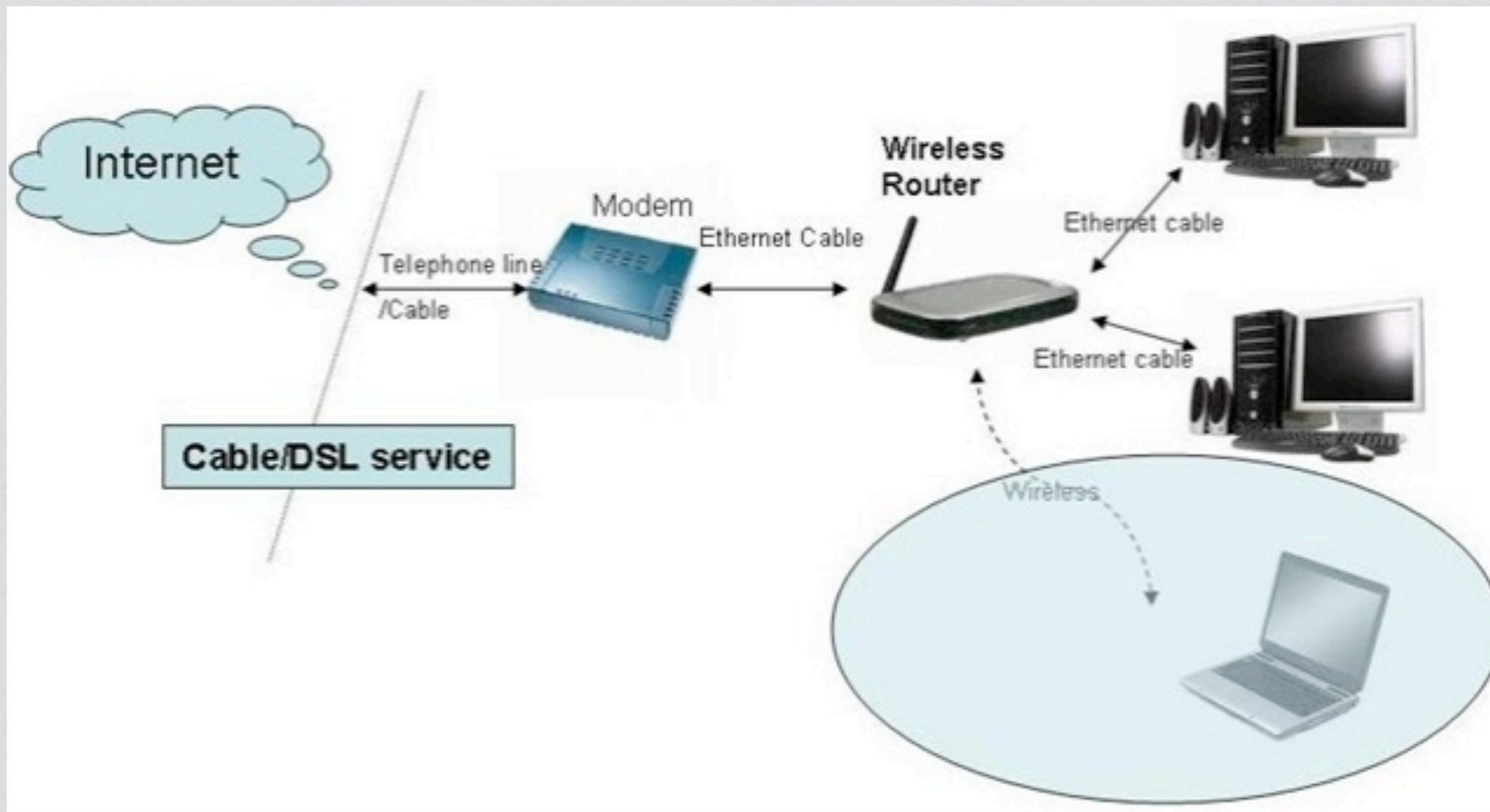
Wireless Router Network Diagram



Routers / APs



Setting up the Router

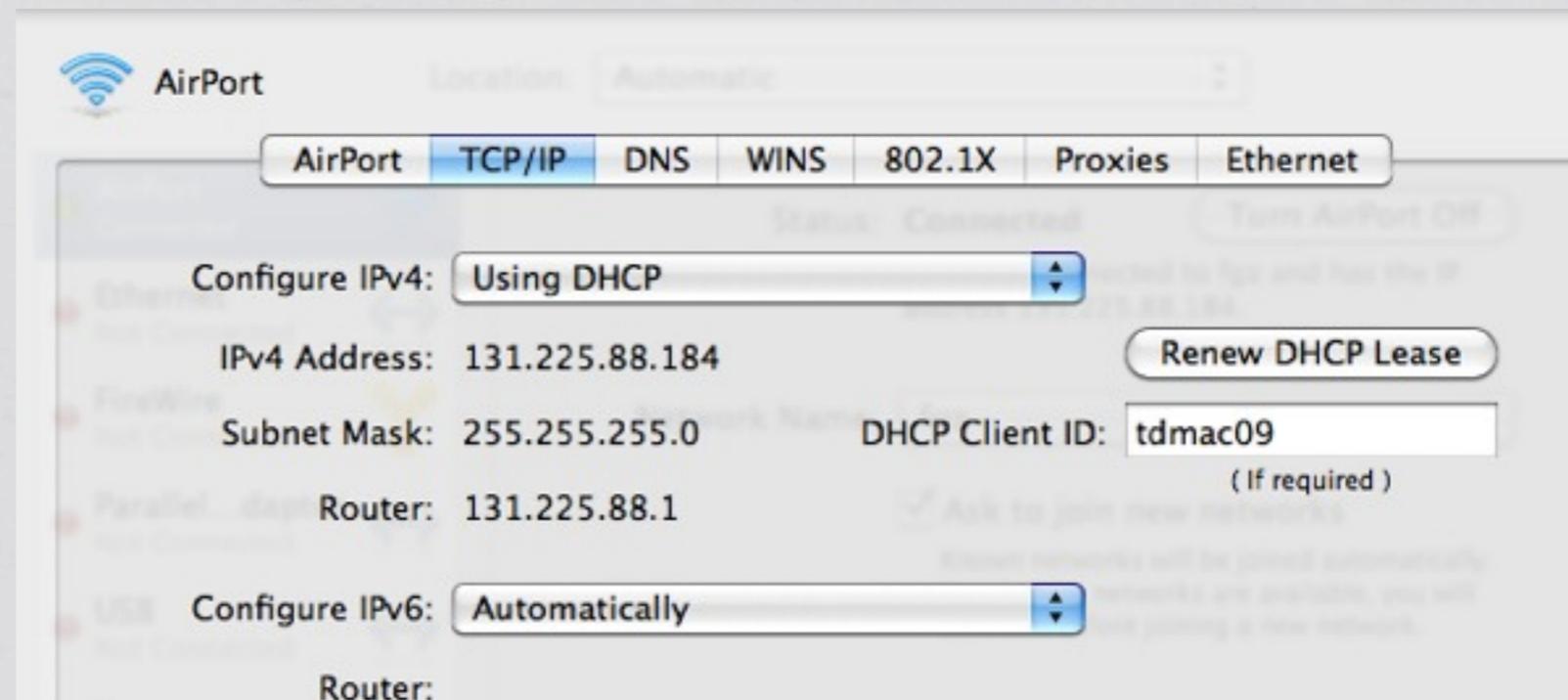
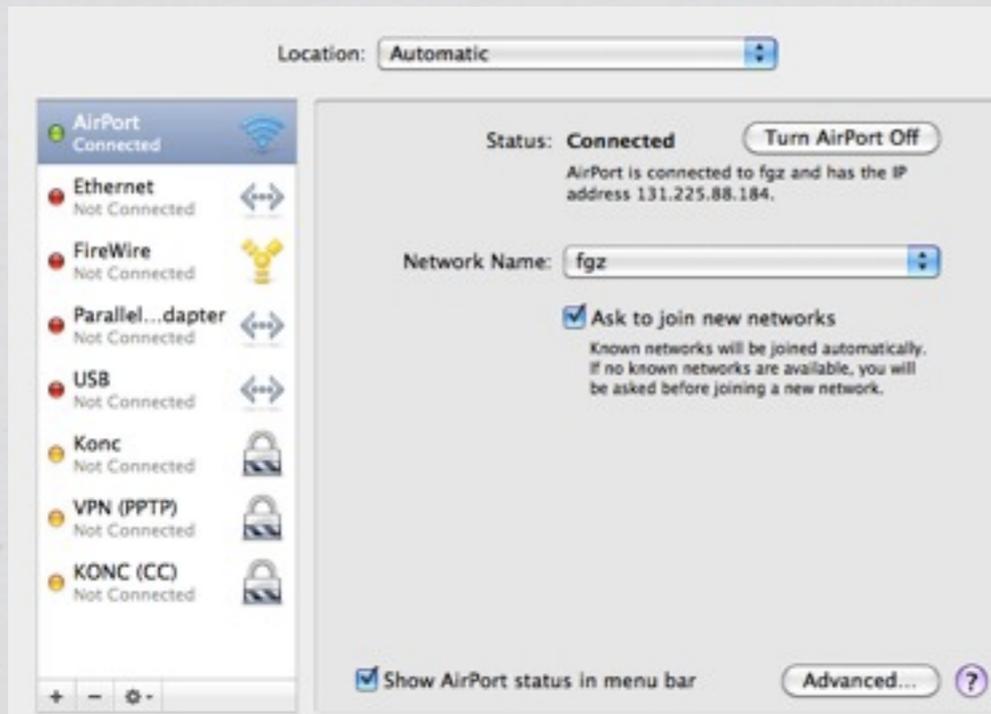


Setting up the Router



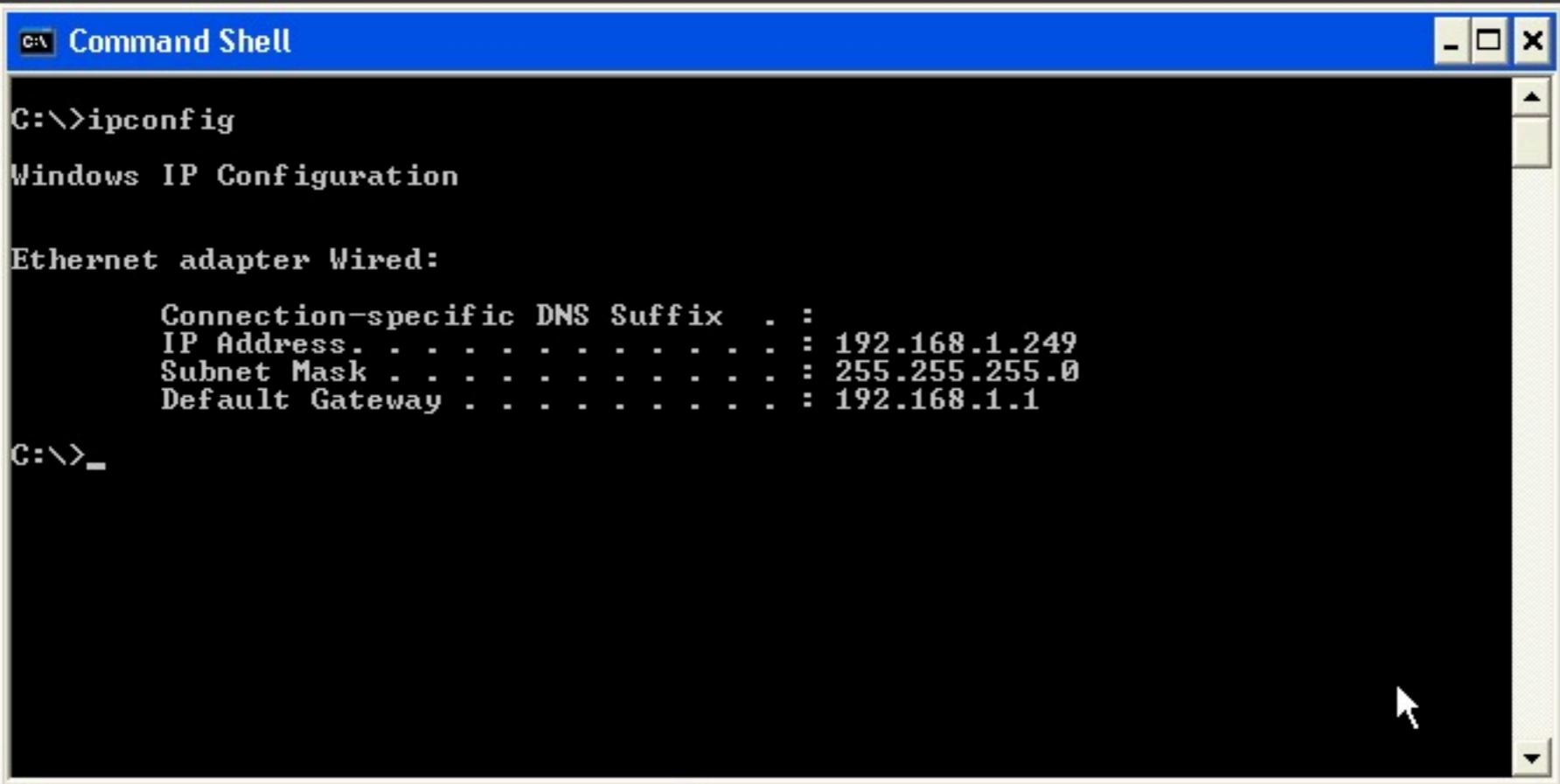
Setting up the Router

Apple



Setting up the Router

Windows



```
C:\>ipconfig

Windows IP Configuration

Ethernet adapter Wired:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . .               : 192.168.1.249
    Subnet Mask . . . . .             : 255.255.255.0
    Default Gateway . . . . .         : 192.168.1.1

C:\>_
```

Setting up the Router

dd-wrt.com ... control panel

Firmware: DD-WRT v24-sp2 (10/10/09) vpn
Time: 11:50:37 up 8 days, 20:22, load average: 0.11, 0.14, 0.08
WAN IP: 0.0.0.0

Setup Wireless Services Security Access Restrictions NAT / QoS Administration Status

System Information

Router		Services	
Router Name	WRT54GL	DHCP Server	Disabled
Router Model	Linksys WRT54G/GL/GS	WRT-radauth	Disabled
LAN MAC	<u>68:7F:74:26:83:6B</u>	WRT-rflow	Disabled
WAN MAC	<u>68:7F:74:26:83:6C</u>	MAC-upd	Disabled
Wireless MAC	<u>68:7F:74:26:83:6D</u>	Sputnik Agent	Disabled
WAN IP	0.0.0.0		
LAN IP	172.27.1.100		

Wireless		Memory	
Radio	Radio is On	Total Available	12.7 MB / 16.0 MB
Mode	AP	Free	1.6 MB / 12.7 MB
Network	Mixed	Used	11.1 MB / 12.7 MB
		Buffers	1.5 MB / 11.1 MB
		Cached	5.1 MB / 11.1 MB

Setup **Wireless** Services Security Access Restrictions NAT / QoS Administration

Basic Settings Radius Wireless Security MAC Filter Advanced Settings WDS

Wireless Physical Interface w10

Physical Interface w10 - SSID [City of Refuge] HWAddr [68:7F:74:26:83:6D]

Wireless Mode	AP
Wireless Network Mode	Mixed
Wireless Network Name (SSID)	CORNY
Wireless Channel	9 - 2.452 GHz
Wireless SSID Broadcast	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Sensitivity Range (ACK Timing)	2000 (Default: 2000 meters)
Network Configuration	<input type="radio"/> Unbridged <input checked="" type="radio"/> Bridged

Virtual Interfaces

Network Address Server Settings (DHCP)

DHCP Type	DHCP Server
DHCP Server	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Start IP Address	192.168.1. 100
Maximum DHCP Users	10

Setting Up Wireless

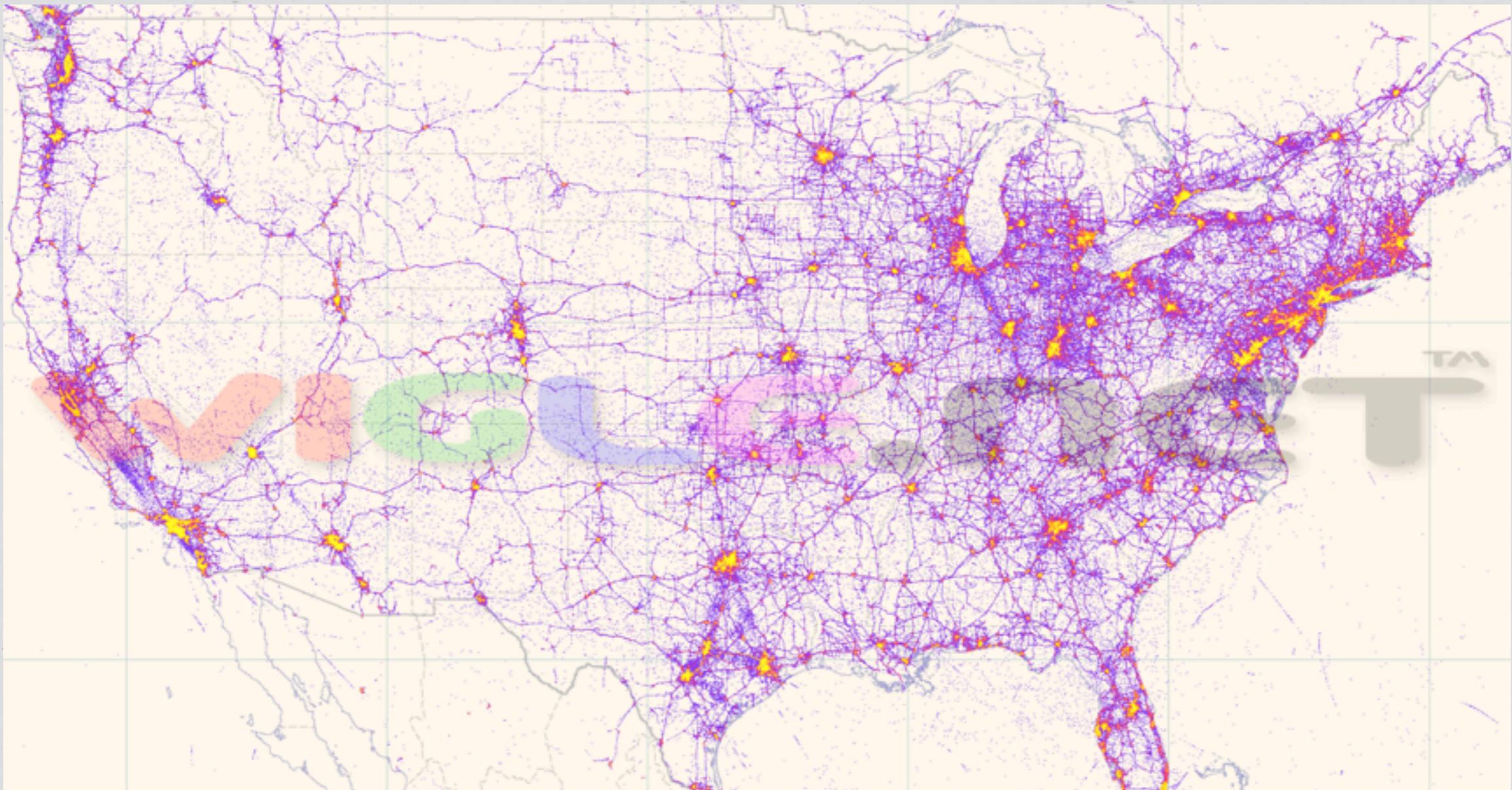
* SSID

- * Enter this name into the router/AP and then on the client to setup the connection.

- * It is best not to broadcast the SSID

 - If you do, don't use an identifiable name like the The Smith Family
(unless your name is not Smith)

- * Set your DHCP range to match your needs.



[Home](#) | [Download](#) | [Forums](#) | [Post File](#) | [Query](#) | [Screenshots](#) | [Stats](#) | [Uploads](#) | [Web Maps](#) | [MapPacks/Trees](#) | [Wiki](#) | [Login](#)

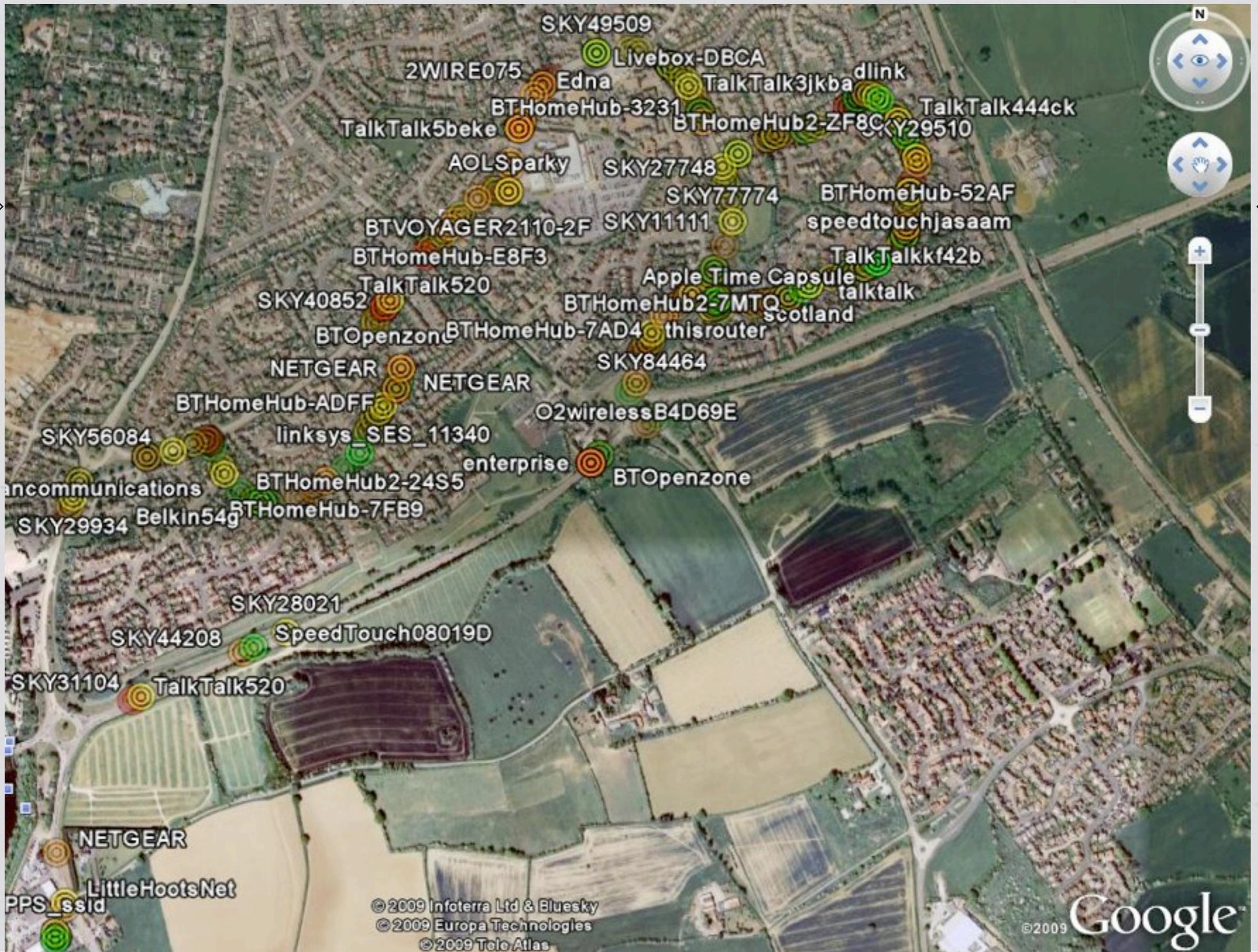


WIGLE.NETTM

Wireless Geographic Logging Engine: Making maps of wireless networks since 2001

wifi cellular unique observations

login user: password: Don't expire auth cookie [reset password](#) or [register a new account](#)



© 2009 Infoterra Ltd & Bluesky
 © 2009 Europa Technologies
 © 2009 Tele Atlas

© 2009 Google

Setting Up Wireless

- * Security Options

- * Open

- * WEP

- * WPA

- * MAC address filter

Wireless Security

- * Open

- * Best if you want to provide internet access to your neighborhood.

- * A great way to potentially share you sensitive information with neighbors and strangers.

- * Very easy and convenient!

Wireless Security

- * WEP

- * Slightly more secure than Open

- * Can be cracked in a matter of seconds

- * Not a good choice.

Wireless Security

- * WPA - Usually the best choice.
- * Use a complex passphrase

The screenshot shows a router's configuration interface. At the top, there are navigation tabs: Setup, **Wireless**, Services, Security, Access Restrictions, NAT / QoS, Administration, and Status. Under the 'Wireless' tab, there are sub-tabs: Basic Settings, Radius, **Wireless Security**, MAC Filter, Advanced Settings, and WDS. The main content area is titled 'Wireless Security w10'. It includes a 'Physical Interface w10 SSID [City of Refuge] HWAddr [68:7F:74:26:83:6D]' header. The configuration fields are: Security Mode (WPA Personal), WPA Algorithms (TKIP+AES), WPA Shared Key (masked with dots), and Key Renewal Interval (in seconds) (3600). There is an 'Unmask' checkbox next to the key field. A 'Help' section on the right explains the Security Mode options. At the bottom, there are 'Save' and 'Apply Settings' buttons.

Wireless Security w10

Physical Interface w10 SSID [City of Refuge] HWAddr [68:7F:74:26:83:6D]

Security Mode: WPA Personal

WPA Algorithms: TKIP+AES

WPA Shared Key: [Masked] Unmask

Key Renewal Interval (in seconds): 3600 (Default: 3600, Range: 1 - 99999)

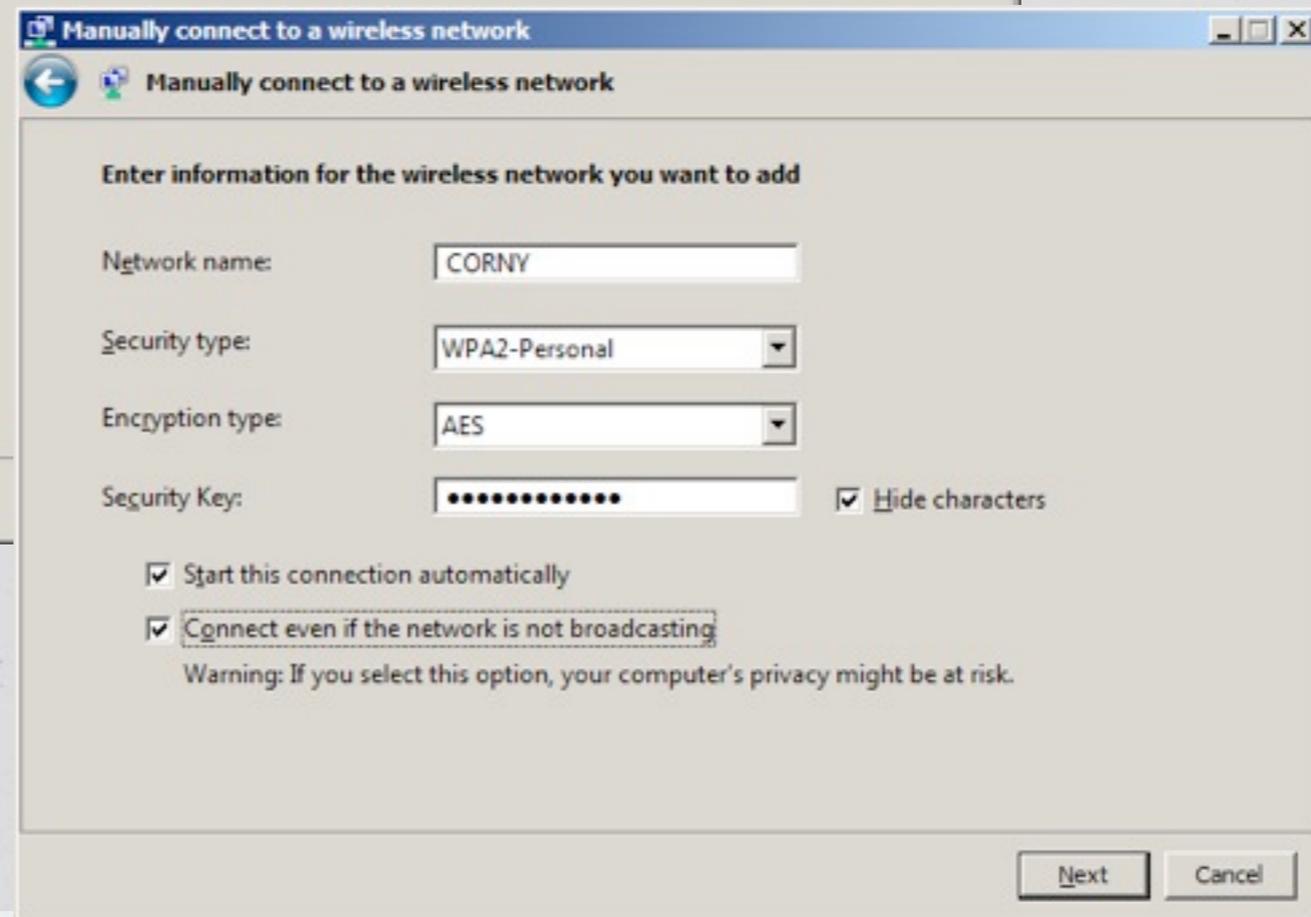
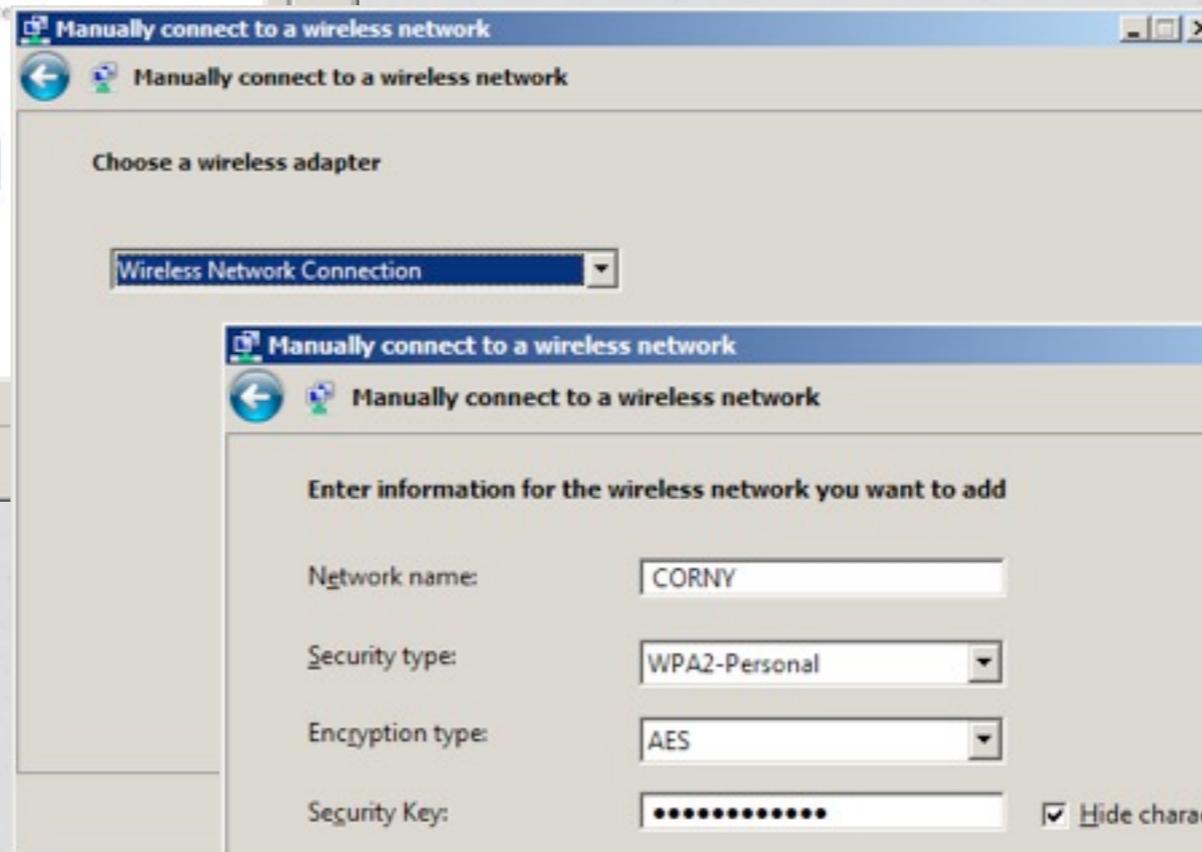
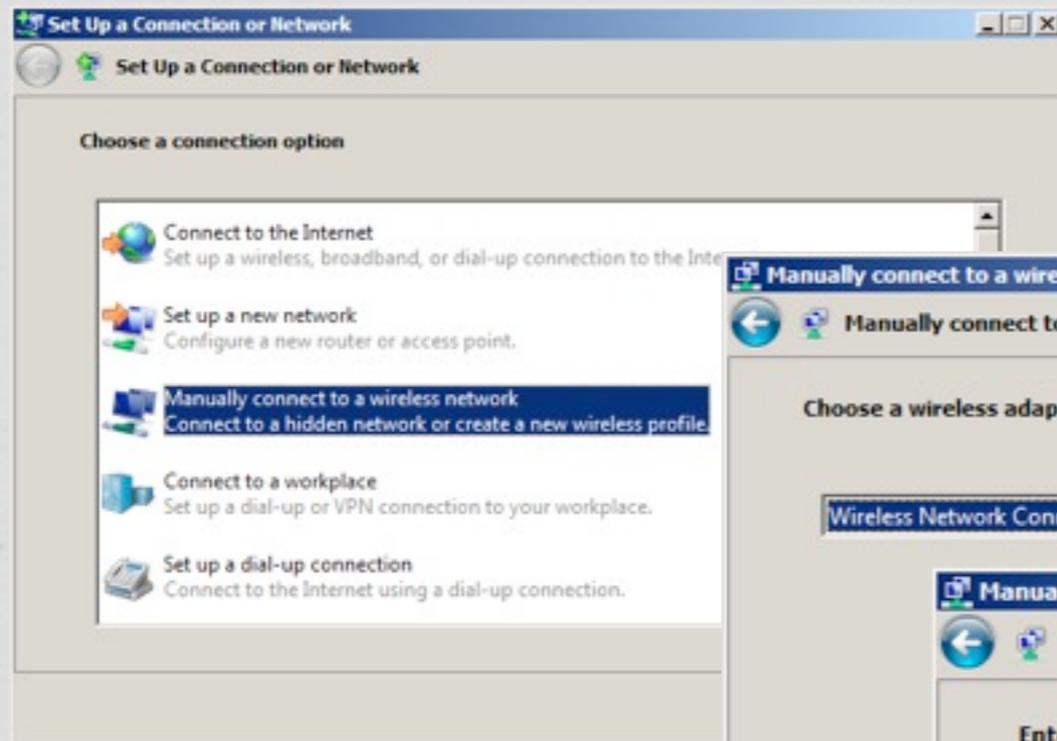
Help more...

Security Mode:
You may choose from Disable, WEP, WPA Personal, WPA Enterprise, or RADIUS. All devices on your network must use the same security mode.

Save Apply Settings

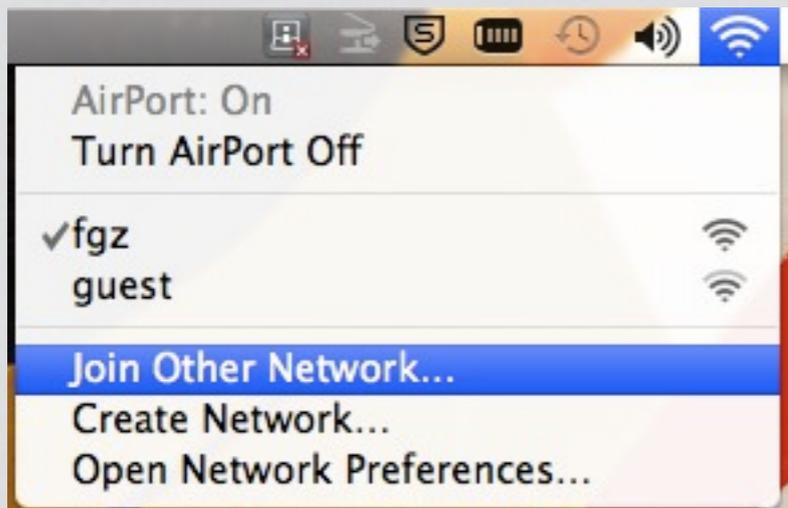
Connect to Hidden Network

Windows



Connect to Hidden Network

Apple



Wireless Security

- * MAC Filtering (MAC does not refer to Apple MacIntosh)
- * Create a set of mac addresses that are allowed or prevented from accessing your network.

The screenshot shows the 'Wireless MAC Filter' configuration page. The navigation tabs at the top include Setup, Wireless, Services, Security, Access Restrictions, NAT / QoS, and Administration. Under the 'Wireless' tab, there are sub-tabs for Basic Settings, Radius, Wireless Security, MAC Filter, Advanced Settings, and WDS. The 'MAC Filter' sub-tab is selected.

Wireless MAC Filter

Use Filter: Enable Disable

Filter Mode: Prevent clients listed from accessing the wireless network
 Permit only clients listed to access the wireless network

[Edit MAC Filter List](#)

[Save](#) [Apply Settings](#) [Cancel Changes](#)

MAC Address Filter List

Enter MAC Address in this format : >

MAC 001 :	<input type="text" value="00:21:79:C7:06:52"/>
MAC 002 :	<input type="text"/>
MAC 003 :	<input type="text"/>
MAC 004 :	<input type="text"/>

Do's 'n Don'ts

- DO -

- * Hide the SSID
- * Limit DHCP addresses
- * Use a complex passphrase
- * Use MAC filtering
- * Monitor your network

Do's 'n Don'ts - Don't -

- * Don't use a SSID that identifies you.
- * If you do, don't use your phone number etc. as your passphrase.
- * Don't leave your router/AP configured with the default or 'no' password.

RouterPasswords.com

Select Router Make:

BELKIN

- MIKROTIK
- MILAN
- MINOLTA QMS
- MINTEL
- MITEL
- MOTOROLA
- MRO SOFTWARE
- MUTARE SOFTWARE
- NAI
- NEC
- NETCOMM
- NETGEAR**
- NETGENESIS
- NETOPIA
- NETPORT
- NETSCREEN
- NETSTAR
- NETWORK APPLIANCE
- NETWORK ASSOCIATES
- NETWORK EVERYWHERE

Find Password

Good Security Practices

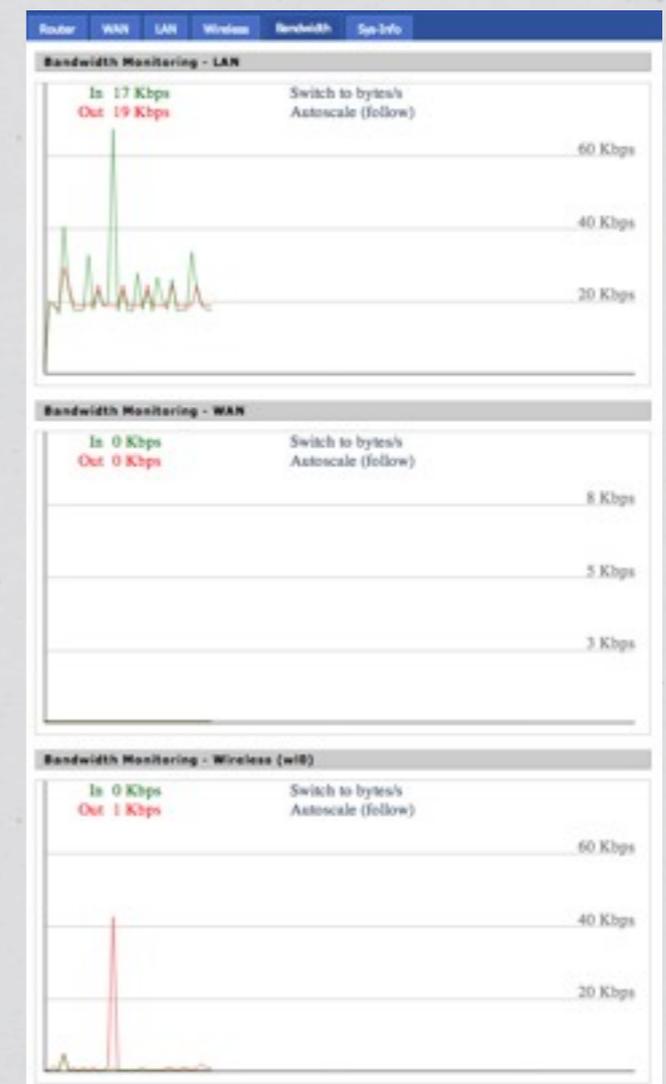
- * Use the tools that come with your router/AP.
 - * Client lists
 - * Bandwidth utilization
 - * Status and performance apps
- * Utilize firewalls and port filtering control where appropriate.

* Find the “status” page and show clients (only one listed in this case).

* Some devices provide other utilization data.

The screenshot shows a network device's status page. At the top, there are fields for IP address, MAC address, and other identifiers. Below this, a section displays interface statistics for eth0, showing 22368 OK packets with no errors and 117442 OK packets with 3341 errors, resulting in a 97% success rate. A 'Wireless Nodes' section is visible, with a 'Clients' table below it. The table has columns for MAC Address, Interface, Uptime, TX Rate, RX Rate, Signal, Noise, SNR, and Signal Quality. One client is listed with MAC address 00:21:79:C7:06:52 on interface eth1, with a signal quality of 56%. At the bottom, there are buttons for 'Site Survey' and 'Wiviz survey', and a status indicator 'Auto-Refresh is On'.

MAC Address	Interface	Uptime	TX Rate	RX Rate	Signal	Noise	SNR	Signal Quality
00:21:79:C7:06:52	eth1	N/A	N/A	N/A	-48	-92	44	56%



WAN Access

Access Policy

Policy [Delete](#) [Summary](#)

Status Enable Disable

Policy Name

PCs [Edit List of clients](#)

Deny

Filter

Internet access during selected days and hours.

Days

Everyday



Sun



Mon



Tue



Wed



Thu



Fri



Sat



Times

24 Hours

From 0 : 00 To 6 : 00

Blocked Services

Catch all P2P Protocols

HTTP ~

HTTPS ~

jabber ~

dns ~

[Add/Edit Service](#)

Website Blocking by URL Address

Summary

- * These pointers will help reduce but will not eliminate risk
- * Be vigilant; the bad guys are.
- * Sacrifice a little convenience for safety and security
- * You could be considered liable for something an intruder does on your network.
- * Know what is going on with your network. Use available tools to filter, monitor, and diagnose.

Etherape - unix

Ethereal - unix/Windows

NTOP - unix/Windows/Mac