USING ROUTERS WITH "WIRELESS INTERNET SERVICE PROVIDER" ("WISP") CAPABILITY

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SUMMARY

A router that has "Wireless Internet Service Provider" ("WISP") capability can grab a wireless Wi-Fi signal and repackage the signal in order to provide you with capabilities, cost savings, and security that you otherwise would not have with a wireless Internet service.
TOPICS

• "Wireless Internet Service Provider" (WISP) fundamentals
• "Edimax" routers with "WISP" mode
• "Netis" routers with "WISP" mode
• "Travel routers" with a "WISP" mode
TOPICS (continued)

• Appendix 1: "Captive Portal" Screens
• Appendix 2: Workaround for Negotiating a "Captive Portal" screen
• Appendix 3: We do not recommend "Tenda" routers
"WISP" FUNDAMENTALS

- WiFi wireless Internet in the home or small business environment does NOT have "wireless isolation" while "public WiFi", hotel Internet service, and WiFi in restaurants, shopping malls, airports, schools, etc. have "wireless isolation"
"WISP" FUNDAMENTALS (continued)

• "wireless isolation"
  = "AP isolation"
  = "Access Point isolation"
  = "client isolation"
  = "station isolation"
  = "wireless client isolation"
"WISP" FUNDAMENTALS (continued)

• Even if a hotel, school, or commercial building has wired Internet, they will almost never allow file or printer sharing for you because of the liability issues and other problems that it would cause.
"WISP" FUNDAMENTALS (continued)

- Some of the more expensive hotels have a tech support phone number that you can call if you want to have file or printer sharing capability activated for specific computers or other devices in your hotel room.
"WISP" FUNDAMENTALS (continued)

• There are two kinds of "wireless isolation":
  Type 1:
  Wireless computers cannot communicate with each other while all have access to the Internet
  Type 2:
  Wireless computers cannot communicate with each other but they can share files and printers with wired computers
"WISP" FUNDAMENTALS (continued)

- Both "Type 1" and "Type 2" wireless isolation will cause Chromecast to fail.
"SSID"  
= "Service Set Identifier" 
which is broadcast by a "Wireless Access Point" 
of a "wireless router"
Broadband Internet

Wireless Router with broadband Internet connection (and without "wireless isolation")

Computer or tablet or cell phone transmits Web-based or local content from the "Chrome" Web browser

TV or Flatscreen Monitor with "Chromecast" Receiver
"WISP" FUNDAMENTALS (continued)

• For "Chromecast" to work, the wireless router cannot have "wireless isolation" turned on:
"WIRELESS ISOLATION" CANNOT BE TURNED ON IN THE EXISTING WIRELESS ROUTER

Wireless Router with broadband Internet connection

TV or Flatscreen Monitor with "Chromecast" Receiver
"WISP" FUNDAMENTALS (continued)

- "Public Wi-Fi" has "wireless isolation"
- Home routers default to no "wireless isolation"
'WISP" FUNDAMENTALS (continued)

• This means that it is easy to use a home network for connecting a computer to a "Chromecast", if the router in a home network has wireless Wi-Fi capability on the local network side of the router.
"WISP" FUNDAMENTALS (continued)

• This means that you cannot use a public Wi-Fi service to for connecting a computer to a "Chromecast" or for sharing files and/or printers between two laptop computers
"Wireless isolation" means that client computers cannot discover each other and they cannot share files/printers, even if "File and Printer Sharing" or "SMB", or "Samba" or "Homegroups" are enabled inside the client computers.
"WISP" FUNDAMENTALS (continued)

• "Public Wi-Fi" (= "Public internet") has "wireless isolation":
  Starbucks' "Google Starbucks", Barnes And Noble, public libraries, Panera Bread, MacDonalds, airports, etc.
"WISP" FUNDAMENTALS (continued)

- Home routers, by default, do not have "wireless isolation" (but some of them let you set up "wireless isolation" in their configuration screens).
"WISP" FUNDAMENTALS (continued)

- "wireless isolation"
  = "AP isolation"
  = "Access Point isolation"
  = "client isolation"
  = "station isolation"
  = "wireless client isolation"
"WISP" FUNDAMENTALS (continued)

- "Wireless isolation" means that even if "File and Printer Sharing" is explicitly turned on in a connected client computer, no data is transmitted from the connected client computer to any other computer on the same local network.
"WISP" FUNDAMENTALS (continued)

- Wireless routers used for public Internet always have "wireless isolation" turned on
- Home routers never have "wireless isolation" turned on
- Some home routers have "wireless isolation" capability that you can activate
There are two kinds of "wireless isolation":
Type 1: Wireless client computers cannot communicate with each other (and all wireless client computers have access to the Internet)
"WISP" FUNDAMENTALS (continued)

- There are two kinds of "wireless isolation" (continued):
  Type 2:
  Wireless client computers cannot communicate with each other but they can share files and printers with wired computers on the same local network.
"WISP" FUNDAMENTALS (continued)

• According to http://www.pcworld.com/article/2150741/tested-6-new-travel-routers-that-can-deploy-a-secure-wifi-network-almost-anywhere.html

In WISP (Wireless Internet Service Provider) mode, the router becomes a client to a wireless Internet service (such as a Wi-Fi hotspot). The router shares that connection with its wireless clients.
"WISP" FUNDAMENTALS (continued)

- "WISP"
  = "Wireless Internet Service Provider"
  = "WISP Mode"
  = "WISP Client" (Fry's ad)
  = "WISP Client Mode" (Fry's ad)
  = "WISP Client Router"
  = "AP Client Router Mode" (TP-Link)
  = "WISP User Internet Sharing" (TP-Link)
  = "WISP Repeater" (D-Link)
wireless or cable
Some of the older models of WISP-capable routers cannot connect wirelessly to client computers on the local network side. These older models of routers can only connect by means of wired Ethernet cablers to client computers on the local network side. These older models are useless for "Chromecast" because "Chromecast" cannot connect by means of an Ethernet wire to a router:
"WISP" FUNDAMENTALS (continued)

- A typical router that does NOT have "WISP" mode: Wired "Internet" or "WAN" jack connects a broadband modem that then connects to the Internet. Wired and/or wireless computers, tablets, televisions, cell phones, etc. connect to the "Local Area Network" (LAN) side of the router:
TYPICAL ROUTER WITH NO "WISP" MODE ("WISP" = "WIRELESS INTERNET SERVICE PROVIDER")

- Internet Service Provider
- wired Ethernet and hardware firewall
- network address translator
- network switch
- network switch for the various wireless access points
- 2.45GHz Wi-Fi wireless access point
- 5GHz Wi-Fi wireless access point
- wired Ethernet jack for optional connection to broadband modem
- intranet (LAN)
"WISP" FUNDAMENTALS (continued)

• A router that has "WISP" mode: A wireless WiFi adapter on the "Internet" or "WAN" side of the router can be used to connect to a WiFi wireless access point that is provided by an Internet Service Provider (ISP). Wired and/or wireless computers, tablets, televisions, cell phones, etc. connect to the "Local Area Network" (LAN) side of the router:
"WISP" FUNDAMENTALS (continued)

- A router that has "WISP" mode: On the "Internet" or "WAN" side of the router, you can either connect to an Internet Service Provider (ISP) in a wired or a wireless manner, but you cannot utilize both the wired and the wireless network adapters at the same time:
USING A "WISP" ROUTER TO "FIX" CHROMCAST TO GET AROUND "WIRELESS ISOLATION"

• Chromecast's requirements for an external wireless router without "wireless isolation" presents significant technical challenges because public Internet services almost always have "wireless isolation".
USING A "WISP" ROUTER TO "FIX" CHROMCAST TO GET AROUND "WIRELESS ISOLATION" (continued)

• Both "Type 1" and "Type 2" wireless isolation will cause "Chromecast" to fail.
• The elegant fix for "Chromecast": Use a "router" that has "Wireless Internet Service Provider" (WISP) capability to connect between the public Wi-Fi Internet service, your laptop, and the Chromecast device.
A laptop or tablet or cell phone transmits Internet-based or local video and audio from the "Chrome" Web browser or a "Chrome" app to a Chromecast Receiver through a router that has "Wireless Internet Service Provider" (WISP) capability. The Chromecast Receiver then outputs the video and audio to a TV or monitor via an HDMI connection.
REGULAR-SIZED ROUTERS THAT HAVE A "WISP" MODE

- Most home and small-business routers DO NOT have a "WISP" mode:
  Instead most routers require an "upstream" wired Ethernet connection with a network jack that is labelled "Internet" or "WAN" (with "WAN" standing for "Wide Area Network"
When shopping for a "WISP" router, be sure to read the manufacturer's specifications and user manuals to make sure that the specific router actually has a "WISP" mode and that the "WISP" mode has the set of features that you need.
REGULAR-SIZED ROUTERS THAT HAVE A "WISP" MODE (continued)

- Two brands of routers that have a well- implemented "WISP" mode are Edimax and Netis
REGULAR-SIZED ROUTERS THAT HAVE A "WISP" MODE (continued)

• "Edimax" routers with "WISP" mode are the best "WISP"-capable routers that we have ever tested in terms of both features and cost

• "Netis" routers with "WISP" mode are the second best "WISP"-capable routers that we have ever tested in terms of both features and cost
"EDIMAX" ROUTERS

- "Edimax" is the only brand of "WISP" routers that have the ability to negotiate a "captive portal" screen (like the "End User Agreement" Web pages at many schools and colleges OR the Web pages with password or PIN number challenges at many hotels)
"EDIMAX" ROUTERS (continued)

- The ability to help you get past a "captive portal" screen can provide you with cost savings when hotel Internet services have a "per-device" charge (where there is a separate daily charge for each "MAC address" that you connect to the Internet
"EDIMAX" ROUTERS (continued)

• Both small "travel routers" and regular-sized routers are available from "Edimax": However, their regular-sized routers run cooler and are more reliable relative to their "travel routers":

According to http://www.amazon.com/Edimax-Wireless-Personal-Hotspot-BR-6258nL/product-reviews/B00ADHPP6Y, the smaller Edimax BR-6258nL router:
It works fine with hotel systems that require authentication through a web interface. All you do is 1) connect to the router; 2) through the configuration screen, tell the router to connect to the hotel's Wi-Fi network in WISP mode; 3) you'll see the hotel's login screen popup in your browser. Once you authenticate, all your devices will have internet.
"EDIMAX" ROUTERS (continued)

• All models of Edimax's wireless routers can connect you to the authentication "splash" Web page of a hotel's Wi-Fi Internet service during the setup of "WISP".
"EDIMAX" ROUTERS (continued)

• Can attach a "HomePlug AV" powerline networking link to the "Internet"/"Wide Area Network" side of the router

• Can attach a "HomePlug AV" powerline networking link to the "Local Area Network"/"Ethernet" side of the router
Edimax

Edimax BR-6478AC New AC1200 Gigabit Dual-Band Wi-Fi Router/Range Extender/AP/Bridge/WISP with USB Port and VPN (White)

Available from these sellers.

- AC1200 High-Speed: Next generation 802.11ac Wi-Fi standard
- 5 Modes in 1: Router, Access Point, Wi-Fi Range Extender, Wi-Fi Bridge and WISP
- Concurrent Dual-Band: Wireless connectivity for 2.4GHz and 5GHz
- VPN (Virtual Private Network): Access secure, remote networks from anywhere and protect privacy on public Wi-Fi and bypass Internet censorship
- USB Port: Storage & FTP file or printer sharing as your own private, secure cloud

Compare with similar items

Used & new (42) from $45.00 + $5.49 shipping
Edimax BR-6478AC New AC1200 Gigabit Dual-Band Wi-Fi Router/Range Extender/AP/Bridge/WISP with USB Port and VPN (White)
- AC1200 High-Speed: Next generation 802.11ac Wi-Fi standard
- 5 Modes in 1: Router, Access Point, Wi-Fi Range Extender, Wi-Fi Bridge and WISP
- Concurrent Dual-Band: Wireless connectivity for 2.4GHz and 5GHz
- VPN (Virtual Private Network): Access secure, remote networks from anywhere and protect privacy on public Wi-Fi and bypass Internet censorship
- USB Port: Storage & FTP file or printer sharing as your own private, secure cloud
$57.52
& FREE Shipping + $0.00 estimated tax

- **New**
- Arrives between Mar. 30 - April 4.
- Want it delivered Monday, March 26? Order it in the next 14 hours and 20 minutes, and choose Two-Day Shipping at checkout. See details
- Shipping rates and return policy.

my Goods
🌟🌟🌟🌟🌟 99%
positive over the past 12 months. (96,061 total ratings)

$58.96
& FREE Shipping + $5.90 estimated tax

- **New**
- Arrives between Mar. 28 - April 4.
- Want it delivered Monday, March 26? Choose Two-Day Shipping at checkout.
- Shipping rates and return policy.

BuyVPC
🌟🌟🌟🌟🌟 93%
positive over the past 12 months. (27,031 total ratings)

$59.00  ✓prime
& FREE Shipping Details + $0.00 estimated tax

- **New**
- Arrives between Mar. 28 - April 4.
- Want it delivered Friday, March 23? Order it in the next 15 hours and 35 minutes, and choose One-Day Shipping at checkout. See details
- Shipping rates and return policy.

Express Goods
🌟🌟🌟🌟🌟 97%
positive over the past 12 months. (25,562 total ratings)

$52.64
+ $6.37 shipping + $5.31 estimated tax

- **New**
- Arrives between March 27-30.
- Want it delivered Wednesday, March 28? Choose Expedited Shipping at checkout.
- Shipping rates and return policy.

Ace Micros
🌟🌟🌟🌟🌟 90%
positive over the past 12 months. (1,536 total ratings)

$60.33
& FREE Shipping + $0.00 estimated tax

- **New**
- Arrives between Mar. 30 - April 4.
- Ships from NY, United States.
- Shipping rates and return policy.

biddeal_co
🌟🌟🌟🌟🌟 86%
positive over the past 12 months. (35,554 total ratings)
"EDIMAX" ROUTERS (continued)

• See
"NETIS" ROUTERS

• "Netis" routers are our second choice for a WISP-capable router
"NETIS" ROUTERS (continued)

• Unlike "Edimax" routers, "Netis" routers do not have the ability to negotiate a "captive portal" screen (like the "End User Agreement" Web pages at many schools and colleges OR the Web pages with password or PIN number challenges at many hotels)
"NETIS" ROUTERS (continued)

• Both small "travel routers" and regular-sized routers are available from "Netis": However, their "travel router" DOES NOT have "WISP" capability so we only recommend Netis' regular-sized routers which do have "WISP" capability.
"NETIS" ROUTERS (continued)

- The lowest-priced models of "Netis" routers have 10/100 Fast Ethernet ports:
  Do not buy them since these older, slower Ethernet ports will bottleneck your Internet download and upload speeds:
  Only buy the models of "Netis" routers that have Gigabit Ethernet ports.
Here is a "Netis" router that we do recommend: This model of "Netis" router is regular-sized, has "WISP" capability, and has Gigabit Ethernet ports:
Netis WF2780 Wireless AC1200 Router, Access Point And Repeater All in One, Advanced QoS, WPS Setup, 5 dBi High Gain Antenna

🌟🌟🌟🌟🌟 295 customer reviews
| 82 answered questions

List Price: $69.99
Price: $59.39 & FREE Shipping. Details
You Save: $10.60 (15%)

Get $50 off instantly: Pay $9.39 upon approval for the Amazon Rewards Visa Card.

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Only 10 left in stock (more on the way).
Want it Friday, March 23? Order within 16 hrs 7 mins and choose One-Day Shipping at checkout. Details
Ships from and sold by Amazon.com. Gift-wrap available.

Model: AC1200
Netis WF2780 Wireless AC1200 Router, Access Point And Repeater All in One, Advanced QoS, WPS Setup, 5 dBi High Gain Antenna

★★★★★ 4.5 out of 5 stars 295 customer reviews
| 82 answered questions

List Price: $69.99

Price: $59.39 & FREE Shipping. Details
• 802.11AC standard with backwards compatibility to all 802.11a/b/g/n devices
• Speeds up to 867Mbps on 5GHz and 300Mbps on 2.4GHz simultaneously, ideal for larger homes with multiple devices
• 4x 5dBi antennas for optimum range
• Advanced security features with the latest WPA2 encryption to protect the network
• Quick setup, with built-in multilingual web management page
• Five Gigabit ports provide 10 times faster than conventional Fast Ethernet connections
• Supports WISP
• Quick setup, with built-in multilingual web management page
"NETIS" ROUTERS (continued)

• See

"TRAVEL ROUTERS"

• Small in size and weight for travel
• Less suspicion at TSA checkpoints at airports
• Run hotter than regular-sized routers
• Less features than regular-sized routers
"Travel routers" have less data throughput speeds and lower Wi-Fi speeds relative to regular-sized routers.
"TRAVEL ROUTERS" WITH "WISP" CAPABILITY

• Not all "travel routers" have "WISP" capability

• If the documentation of a "travel router" does not spell out "WISP", then that model does not have "WISP" capability
"TRAVEL ROUTERS" WITH "WISP" CAPABILITY

• Here are some models of "travel routers" that have "WISP" capability:
TP-Link

TP-Link AC750 Wireless Wi-Fi Travel Router (TL-WR902AC)

59 customer reviews
55 answered questions

List Price: $44.99
Price: $40.99 & FREE Shipping. Details
You Save: $4.00 (9%)

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Setup options: Get expert setup and hands-on training. Details

Without expert setup
Expert setup +$99.00

See more

- Travel-Sized Design – Conveniently small and light
TP-Link AC750 Wireless Wi-Fi Travel Router (TL-WR902AC)
• Travel-Sized Design – Conveniently small and light to pack and take on the road, creating Wi-Fi network via Ethernet
• Dual Band AC750 Wi-Fi – Strong, fast connection for HD streaming on all your devices
• One Switch for Multiple Modes – Perfect for Wi-Fi at home, your hotel room or on the road
• Flexible Power – Micro USB port to an adapter, portable charger or laptop
• Industry-leading 2-year warranty and unlimited 24/7 technical support
"TRAVEL ROUTERS" WITH "WISP" CAPABILITY

• See
TRENDnet AC750 Wireless Dual Band Travel Router, Share a Single Internet Connection with Multiple Users, WPS for Security, Plug & Play, WISP, AP, Repeater Mode, TEW-817DTR

45 customer reviews
| 11 answered questions

Amazon’s Choice for "trendnet travel router"

Price: $34.99 & FREE Shipping. Details

Get $50 off instantly: Pay $0.00 upon approval for the Amazon Rewards Visa Card.

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Ships from and sold by Amazon.com. Gift wrap
TRENDnet AC750 Wireless Dual Band Travel Router, Share a Single Internet Connection with Multiple Users, WPS for Security, Plug & Play, WISP, AP, Repeater Mode, TEW-817DTR
Price: $34.99 & FREE Shipping
"TRAVEL ROUTERS" WITH "WISP" CAPABILITY

- See https://www.trendnet.com/products/wifi/AC-routers/AC750/TEW-817DTR
APPENDIX 1
"CAPTIVE PORTAL" SCREENS

• See
https://en.wikipedia.org/wiki/Captive_portal
Free access with your OurHotel Rewards membership

Username
Password

Not an OurHotel Rewards member, join now
Wifi Network & Internet conditions:

You are solely responsible for any illegal activities once you click the "OK, I AGREE" button.

We are not responsible for faulty operation of your computer or equipment. You may be asked to stop using your equipment if it causes interference to other residents.

A service charge will be made if you require assistance to connect to our routers.

This banner will appear again periodically.

To renew your access time, you must agree once again to these conditions.

Ok, I Agree!

Powered by Tomato Firmware and NoCat Splash
Authentication Required

Please enter your username and password to continue.

Username: 

Password: 

Continue
APPENDIX 2
WORKAROUND FOR NEGOTIATING A "CAPTIVE PORTAL" SCREEN

• If your "travel router" cannot negotiate a "login screen" (is not a "Edimax" router) you can use a laptop or a virtual machine to "spoof" the MAC address of your "travel router" during the setup process for a "WISP" router:
This procedure is called "spoofing a MAC address" or "MAC cloning"

"MAC" stands for "Media Access Control"

A "MAC address" is also known as a "physical address" or a "hardware address"
APPENDIX 2
WORKAROUND FOR NEGOTIATING A "CAPTIVE PORTAL" SCREEN (continued)

• SPOOFING OR CLONING A "MAC ADDRESS" STEP 1: Determine the MAC address for the WAN or Internet (RJ45) port of the travel router.
APPENDIX 2
WORKAROUND FOR NEGOTIATING A "CAPTIVE PORTAL" SCREEN (continued)

• SPOOFING OR CLONING A "MAC ADDRESS" STEP 2:
  Use the appropriate tool or settings menu on your computer's network adapter to change it's MAC address to the MAC address of the router.
APPENDIX 2
WORKAROUND FOR NEGOTIATING A "CAPTIVE PORTAL" SCREEN (continued)

• SPOOFING OR CLONING A "MAC ADDRESS" STEP 3:
Using your computer, log into a Web browser and complete the authentication process.
• SPOOFING OR CLONING A "MAC ADDRESS" STEP 4: Change your computer's MAC address back to it's default MAC address and then reboot your computer.
APPENDIX 2
WORKAROUND FOR NEGOTIATING A "CAPTIVE PORTAL" SCREEN (continued)

- SPOOFING OR CLONING A "MAC ADDRESS" STEP 5:
  Power on your router and then complete the "WISP" setup
• SPOOFING OR CLONING A "MAC ADDRESS" (continued):
APPENDIX 2
WORKAROUND FOR NEGOTIATING A "CAPTIVE PORTAL" SCREEN (continued)

- SPOOFING OR CLONING A "MAC ADDRESS" (continued):
  Reference for the steps for spoofing a "MAC address":
  https://plus.google.com/+MoritzTolxdorff/posts/4pKyBEr2sMK:
WORKAROUND FOR NEGOTIATING A "CAPTIVE PORTAL" SCREEN (continued)

- SPOOFING OR CLONING A "MAC ADDRESS" (continued):
  See also
  http://vignesh.foamsnet.com/2014/06/use-your-chromecast-roku-on-hotel-wifi.html