

Broadband Hamnet

Ham Radio
2.4 GHz WiFi

- ▶ What is Broadband Hamnet?
- ▶ A network of IP WiFi routers for Ham use
- ▶ Uses repurposed Home WiFi Gear
- ▶ Some home WiFi operates in 2.4 GHz Band
- ▶ Typically Linksys WRT54 series routers
- ▶ Only certain model and versions will work

- ▶ What can it do?
- ▶ Allows hams to send files, audio, video, etc. without using the internet.
- ▶ Remote computer control.
- ▶ Forms a Ham Radio Intranet, like within a typical home or business but between QTHs.
- ▶ Allows connecting to the internet but all traffic must comply with Part 97 rules.

- ▶ What are the limitations?
- ▶ Range: 2.4 GHz is mostly line of sight.
- ▶ Typically requires high gain antennas.
- ▶ Narrow antenna beamwidth limits location options.
- ▶ High elevation above ground is essential.
- ▶ Coax feedline is lossy.
- ▶ Connectors are reverse SMA & TNC.

- ▶ What are the positives?
- ▶ Price: typically \$25 or less used for router.
- ▶ 2.4 GHz Yagi/dish antennas are affordable.
- ▶ Routers can be remote and powered by POE.
- ▶ Remote POE operation minimizes coax loss.
- ▶ Most items are available from eBay, Amazon, Hamfest, & possibly Flea Markets.
- ▶ Low power consumption – possibly by battery

- ▶ Typical Setup:
 - ▶ Linksys WRT54G or GT router
 - ▶ 17 dBi WiFi Yagi for 2.4 GHz w/ N connector
 - ▶ Coax LMR240 or better with N & RP-SMA
 - ▶ RP-SMA to RP-TNC to connect to router
- ▶ For POE Operation:
 - ▶ Add POE Ethernet switch and POE splitter

- ▶ Node Configuration:
 - ▶ Callsign with extension (–01 typical)
 - ▶ Secure password

- ▶ Node Status:
 - ▶ Shows connection to nodes within range
 - ▶ Auto refresh option

- ▶ Node Topology:
- ▶ Mesh Topology – decentralized
- ▶ Automatically connects to other Hamnet nodes
- ▶ Automatically finds new packet route if node drops
- ▶ WiFi is not accessible to public – only Hamnet nodes can connect to a Hamnet node

Computer #1
connected to Node
#1 LAN port

Linksys WRT54G
Router #1 with
Hamnet Node
Software



Computer #2
connected to Node
#2 LAN port

Linksys WRT54G
Router #2 with
Hamnet Node
Software



- ▶ IP Address Scheme:
- ▶ Default for WRT54G is 8 addresses per node
- ▶ All IPs start with 10 (10.xxx.xxx.xxx)
- ▶ Subnet Mask is 255.255.255.248
- ▶ Only 5 IPs available for devices per node
- ▶ All node to node traffic must be routed
- ▶ Routing is handled by Hamnet software

Computer #1 LAN
Subnet 10.36.145.8
IP 10.36.145.13

Linksys WRT54G
Router #1 Node
Subnet 10.36.145.8
IP 10.36.145.9



Computer #2 LAN
Subnet 10.121.24.0
IP 10.121.24.5

Linksys WRT54G
Router #2 Node
Subnet 10.121.24.0
IP 10.121.24.1



Hamnet Software
routes packets
between all Hamnet
10.x.x.x subnets

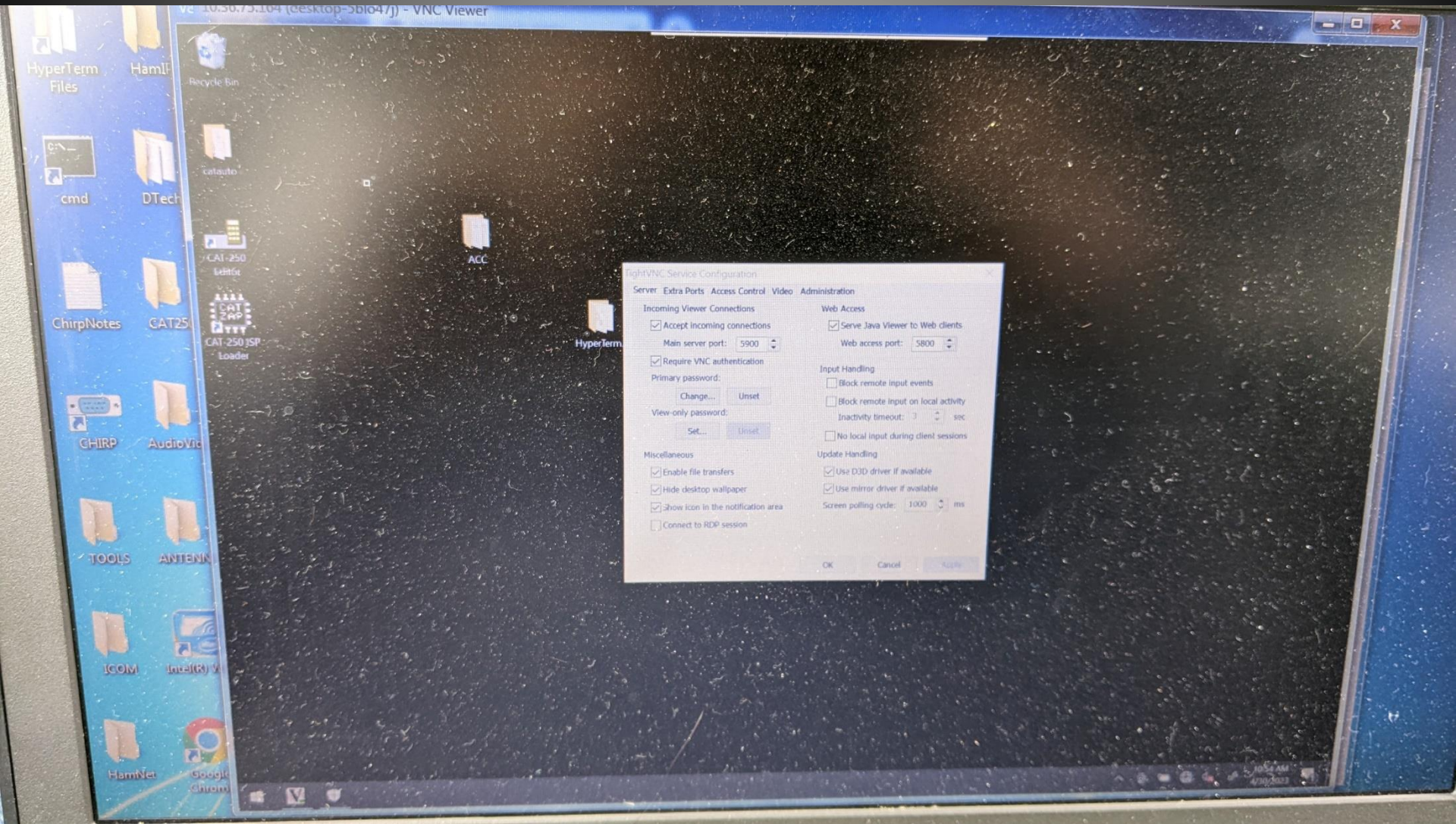
▶ Websites:

▶ <http://www.broadband-hamnet.org/>

▶ <https://wcares.org/hamnet-a-broadband-mesh-network/>

▶ <https://sites.temple.edu/tuarc/broadband-hamnet/>

Laptop in mobile connecting to repeater controller Laptop



- ▶ IP Routing:
- ▶ If PC is also connected to home WiFi...
- ▶ It won't talk across nodes: internet takes over
- ▶ Fix: Add a permanent ROUTE TABLE entry
- ▶ Use IPCONFIG to get PC gateway for node

- ▶ As administrator, run command prompt
- ▶ `route -p add 10.0.0.0 255.255.255.248 10.x.x.x(the node gateway) metric 100`
- ▶ Should respond OK!

