

CAIECN PROJECT

CAPE AND ISLANDS EMERGENCY COMMUNICATIONS NETWORK

2026-10-05

V13 2026-10-05

AGENDA

- WHO ARE WE?
- WHAT IS OUR MISSION?
- WHAT HAVE WE DONE?
- WHAT'S THE LATEST?

WHO ARE WE?

- LEM W1LEM
- BRUCE WA3SWJ
- ROB K1UI
- AL WW1RF
- FRANK WQ1O
- JON N1ILZ
- STACEY W1LYN
- DAVE KC1XXX
- RICH KC1TNF
- DON AC5YK
- STAN W1LE
- MIKE W1MLL
- DON AB1PH
- PAUL NM1Z
- TOM KC1QBB
- JASON KC1MLQ

YOU?

WHAT IS OUR MISSION?

- PROVIDE SUBSTITUTE COMMUNICATIONS “WHEN ALL ELSE HAS FAILED”
 - INTRA- AND INTER-SITE VOICE, VIDEO, FILE TRANSFER, ETC.
 - DEPLOY MOBILE MESH NODES
- PROVIDE REMOTE VIDEO TO THE DCR FIRE SERVICE FROM VARIOUS FIRE TOWERS

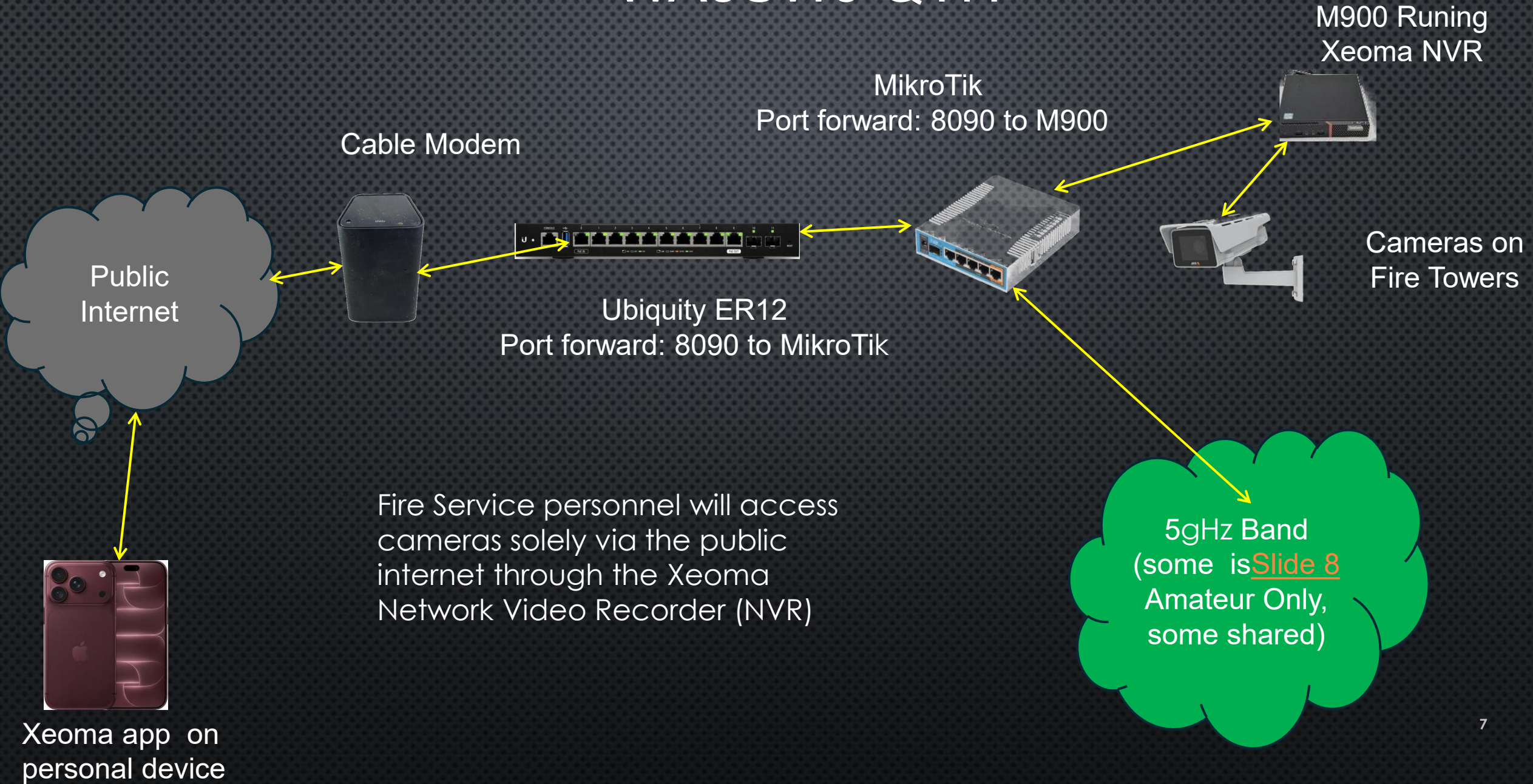
WHAT HAVE WE DONE SO FAR?

- DEMONSTRATED THE CAPABILITY TO PUBLIC SAFETY PERSONNEL
- WORKED WITH THE FIRE SERVICE TO REFINE APPROACH TO VIDEO SURVEILLANCE

WHAT'S THE LATEST?

- ESTABLISHED COMMUNICATION BETWEEN HOME STATIONS AND THE DENNIS AND BREWSTER FIRE TOWERS AND BETWEEN THE FIRE TOWERS
- ESTABLISHED TUNNELS FROM HOME STATIONS TO SUPERNODE IN NH
 - PROVIDE CONNECTIVITY ACROSS OUR NETWORK AND BEYOND OVER THE INTERNET (OVER RF IN THE FUTURE)

WA3SWJ QTH



Dennis Fire Tower to WW1RF and Brewster Fire Tower

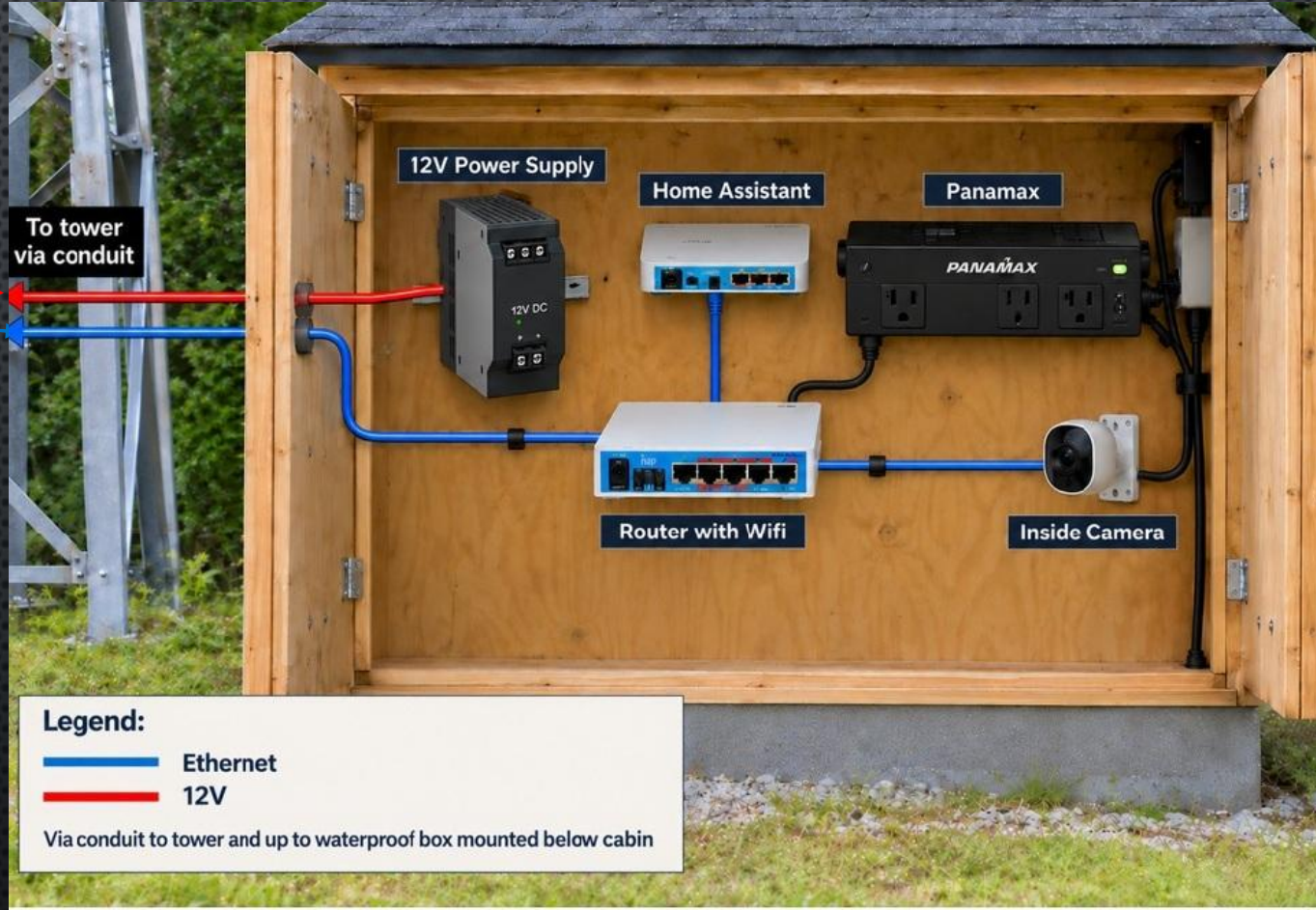
Dennis Fire Tower
(RF link to Brewster)

Repeater Shed at Dennis FireTower Site

Brewster Fire Tower
(RF link to Dennis)



Conduit



Ubiquity PowerBeam WA3SWJ-N07
(RF link to Dennis),
Camera facing West

Ubiquity PowerBeam WA3SWJ-N08
Ubiquity LightBeam WA3SWJ-N06
PTZ Camera facing West
(uses Wifi from Lightbeam)
2nd Camera Facing East (planned)
Box beneath cabin with POE
Conduit carries data
and power to Box

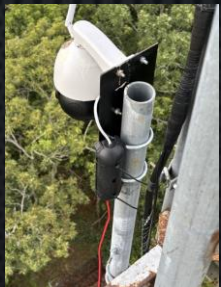
Dennis Fire Tower (RF link to Brewster and WW1RF)



- A box mounted under the cabin contains the POE switch powered by 12V line from the shack via conduit traveling up tower leg
- Cameras and their radios are powered and connected via this POE



- Ubiquiti LightBeam WA3SWJ-N08 RF link to Brewster
 Currently sector antenna WA3SWJ-N05, to be replaced
- Ubiquiti LightBeam WA3SWJ-dennis-ma-mode-6 RF Link to WW1RF
 WW1RF provides internet access
- PTZ Camera facing West uses Wifi from Lightbeam
 (to be replaced by fixed camera)
- 2nd Camera Facing East planned at request of Fire Service
- Each camera provides 180 degree view (total 360)



Dennis Fire Tower to WW1RF and Brewster Fire Tower

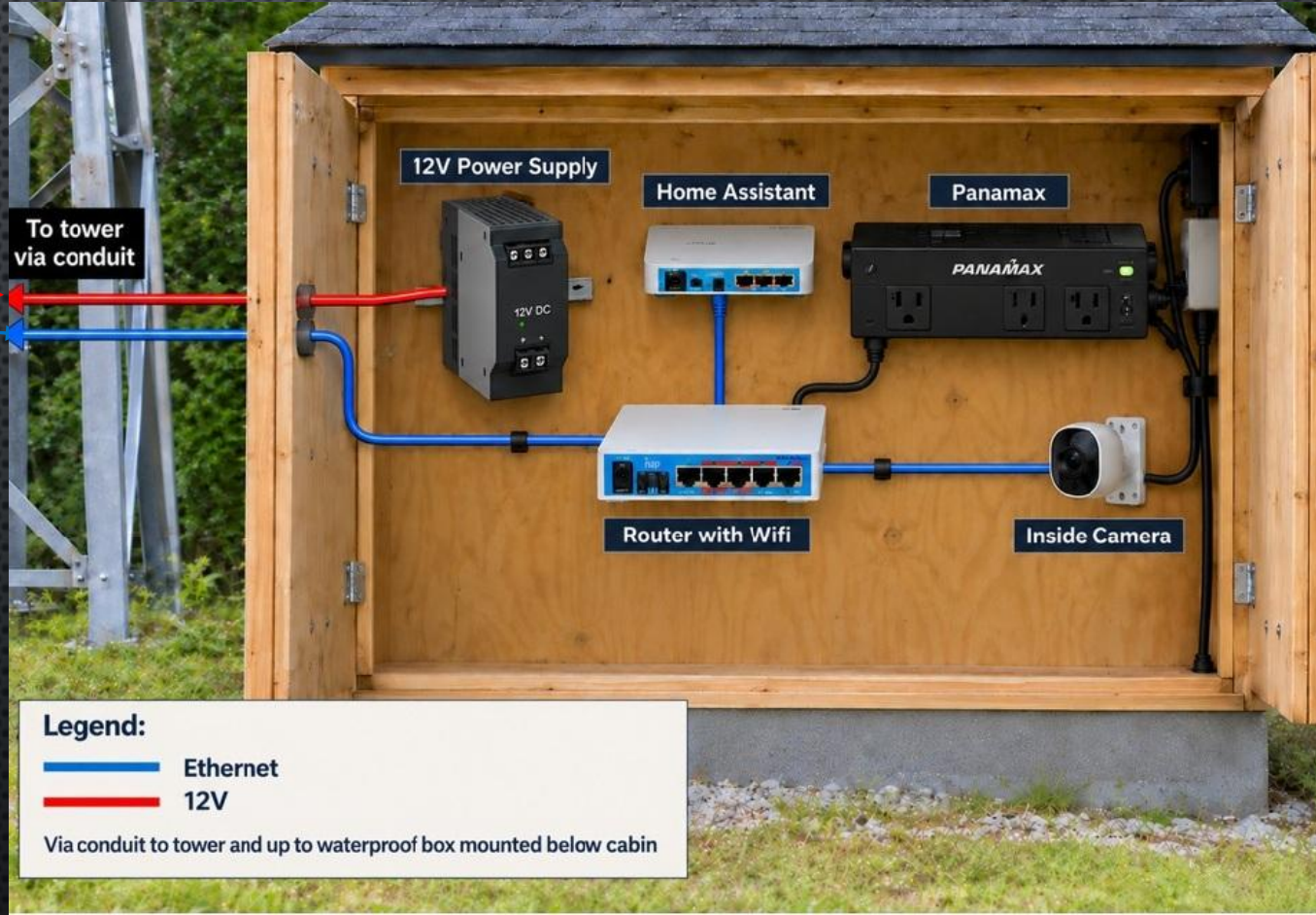
Dennis Fire Tower
(RF link to Brewster)

Repeater Shed at Dennis FireTower Site

Brewster Fire Tower
(RF link to Dennis)



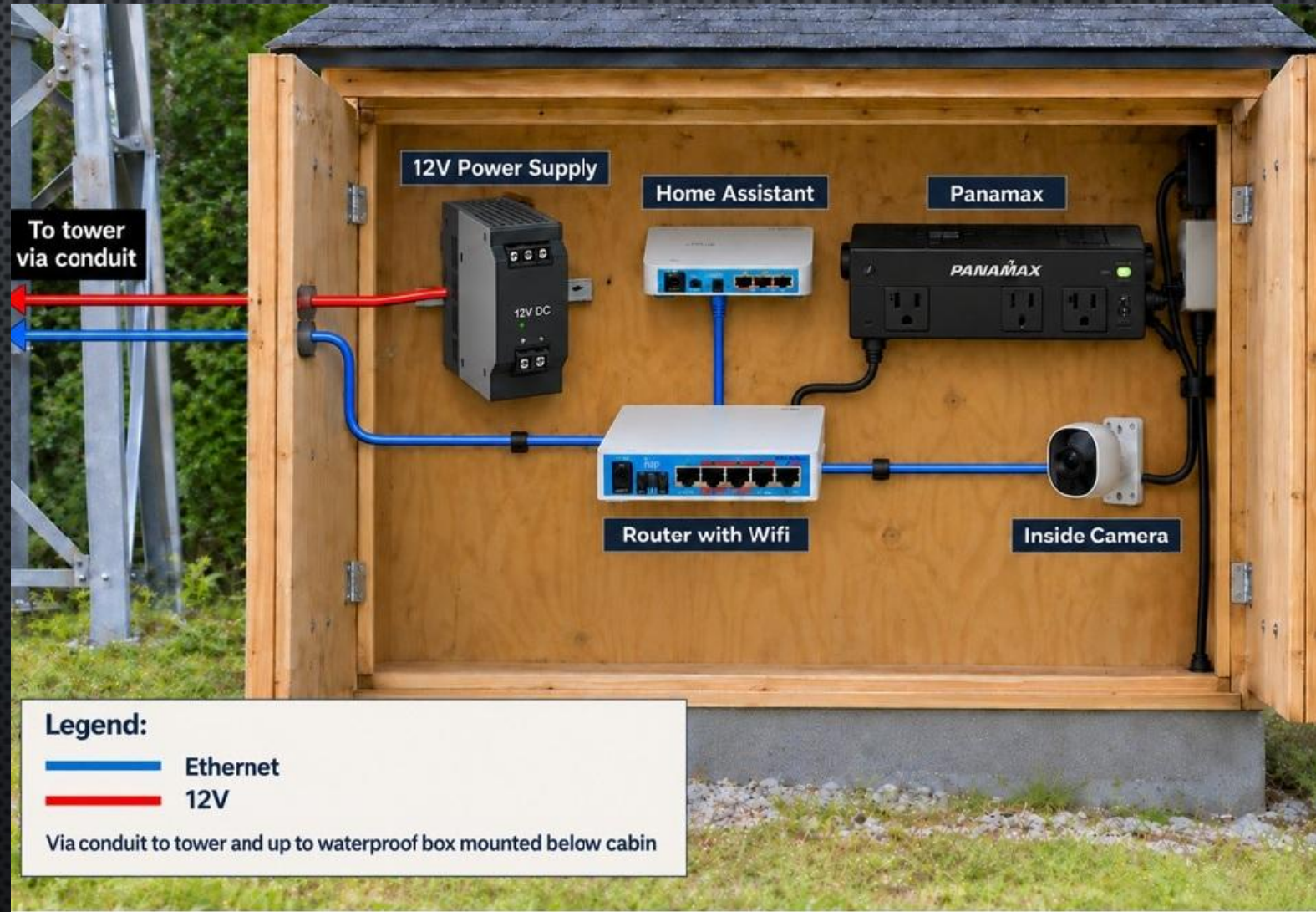
Conduit



Ubiquity PowerBeam WA3SWJ-N07
(RF link to Dennis),
Camera facing West

Ubiquity PowerBeam WA3SWJ-N08
Ubiquity LightBeam WA3SWJ-N06
PTZ Camera facing West
(uses Wifi from Lightbeam)
2nd Camera Facing East (planned)
Box beneath cabin with POE
Conduit carries data
and power to Box

Repeater Shed at Dennis Fire Tower Site



Dennis Fire Tower to WW1RF and Brewster Fire Tower

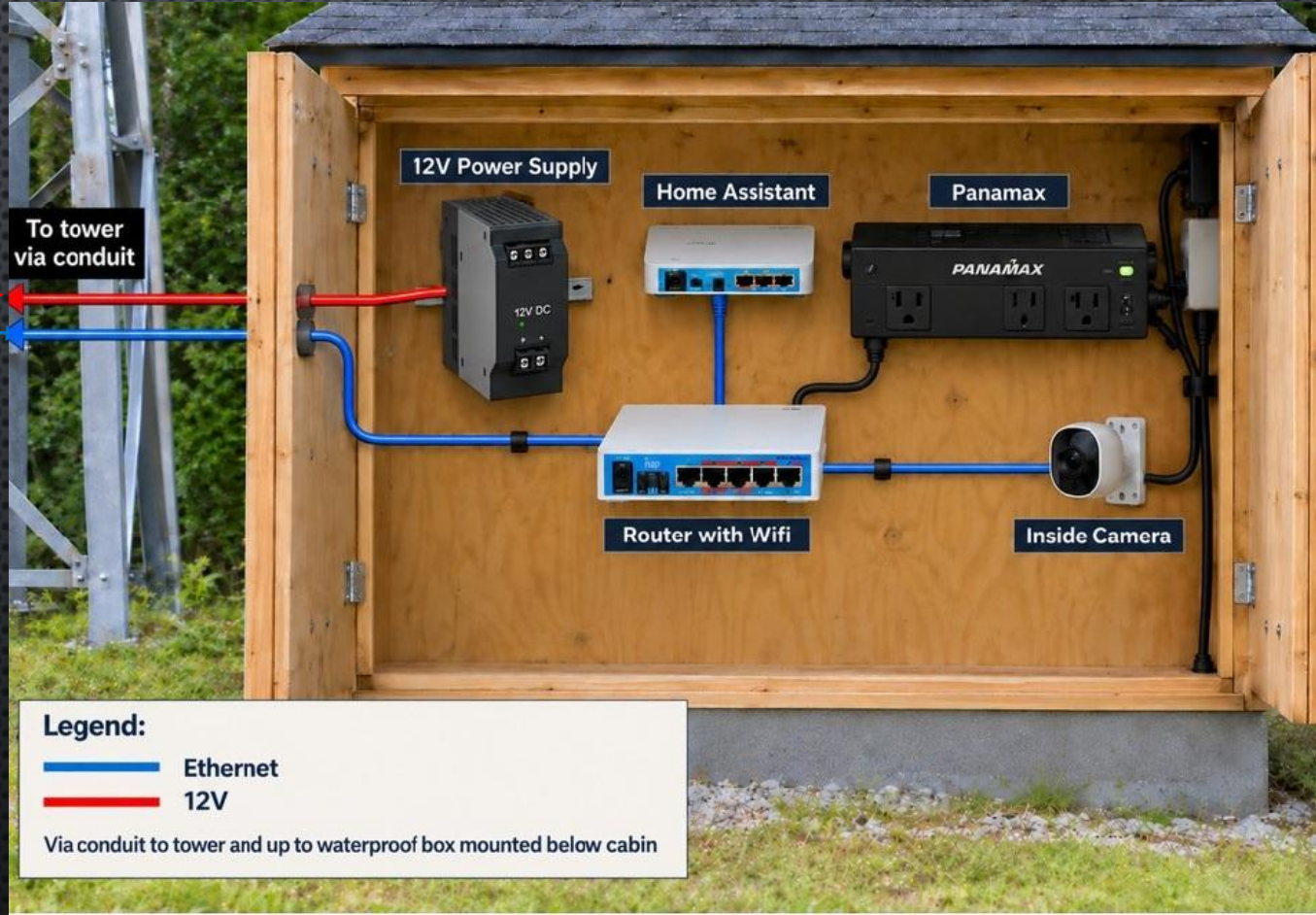
Dennis Fire Tower
(RF link to Brewster)

Repeater Shed at Dennis FireTower Site

Brewster Fire Tower
(RF link to Dennis)



Conduit



Ubiquity PowerBeam
WA3SWJ-N07
(RF link to Dennis),
Camera facing West

Ubiquity PowerBeam WA3SWJ-N08
Ubiquity LightBeam WA3SWJ-N06
PTZ Camera facing West
(uses Wifi from Lightbeam)
2nd Camera Facing East (planned)
Box beneath cabin with POE
Conduit carries data
and power to Box

Brewster Fire Tower

RF link to Dennis Fire Tower



- Ubiquiti PowerBeam WA3SWJ-N07 RF link to Dennis
- Camera facing West
- Future
 - Dish to connect to a 3rd Fire Tower
 - Additional camera facing east

WW1RF QTH

Ubiquiti LiteBeam to DFT



WW1RF MikroTik

WW1RF-Dennis-ma-node-01



Cable Modem

Isolate
Personal Network



DMZ Router

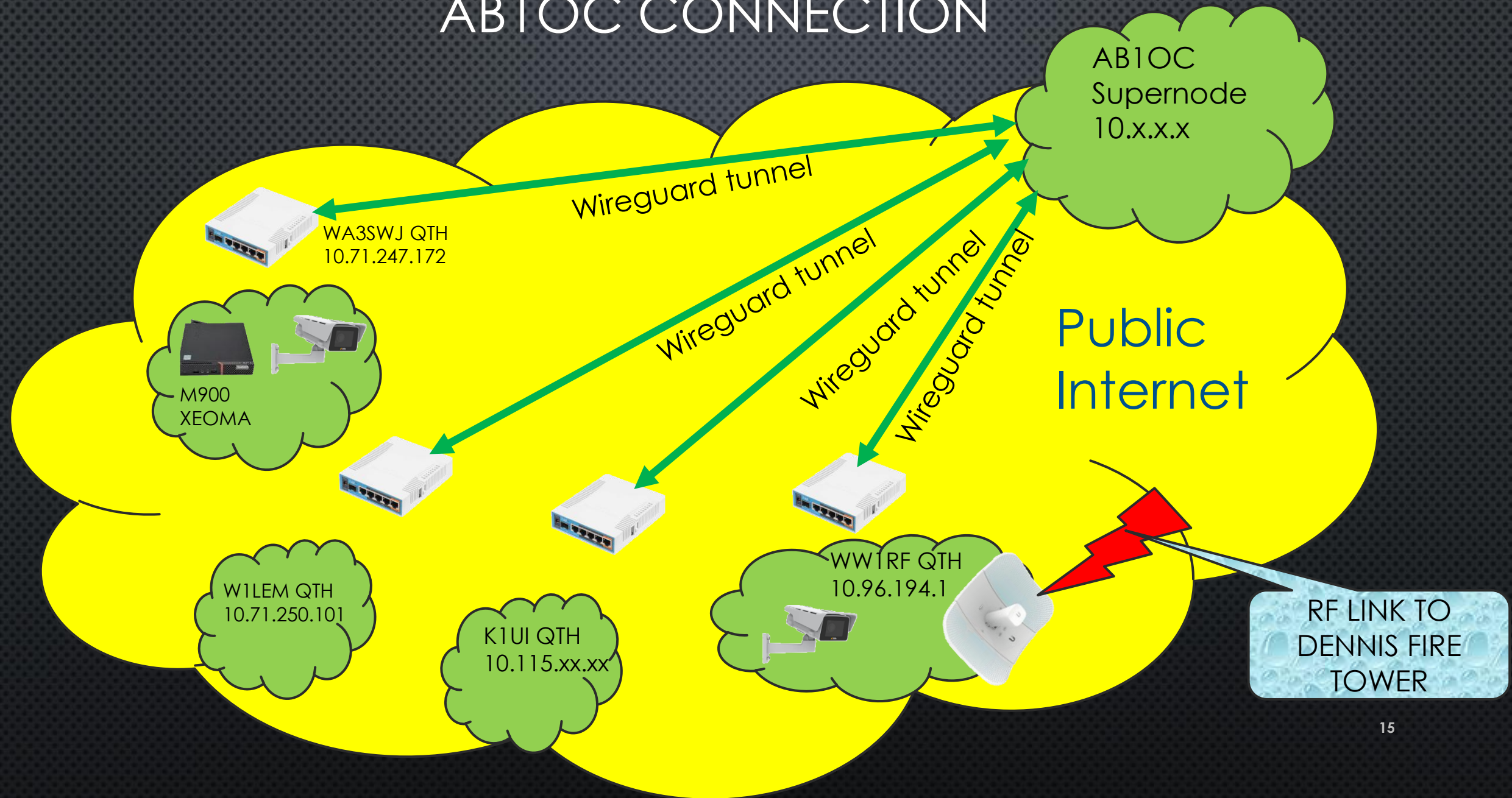


House Router)

Public Internet
entry to
NEDECN and
beyond via
AB1OC/MVARA



AB1OC CONNECTION



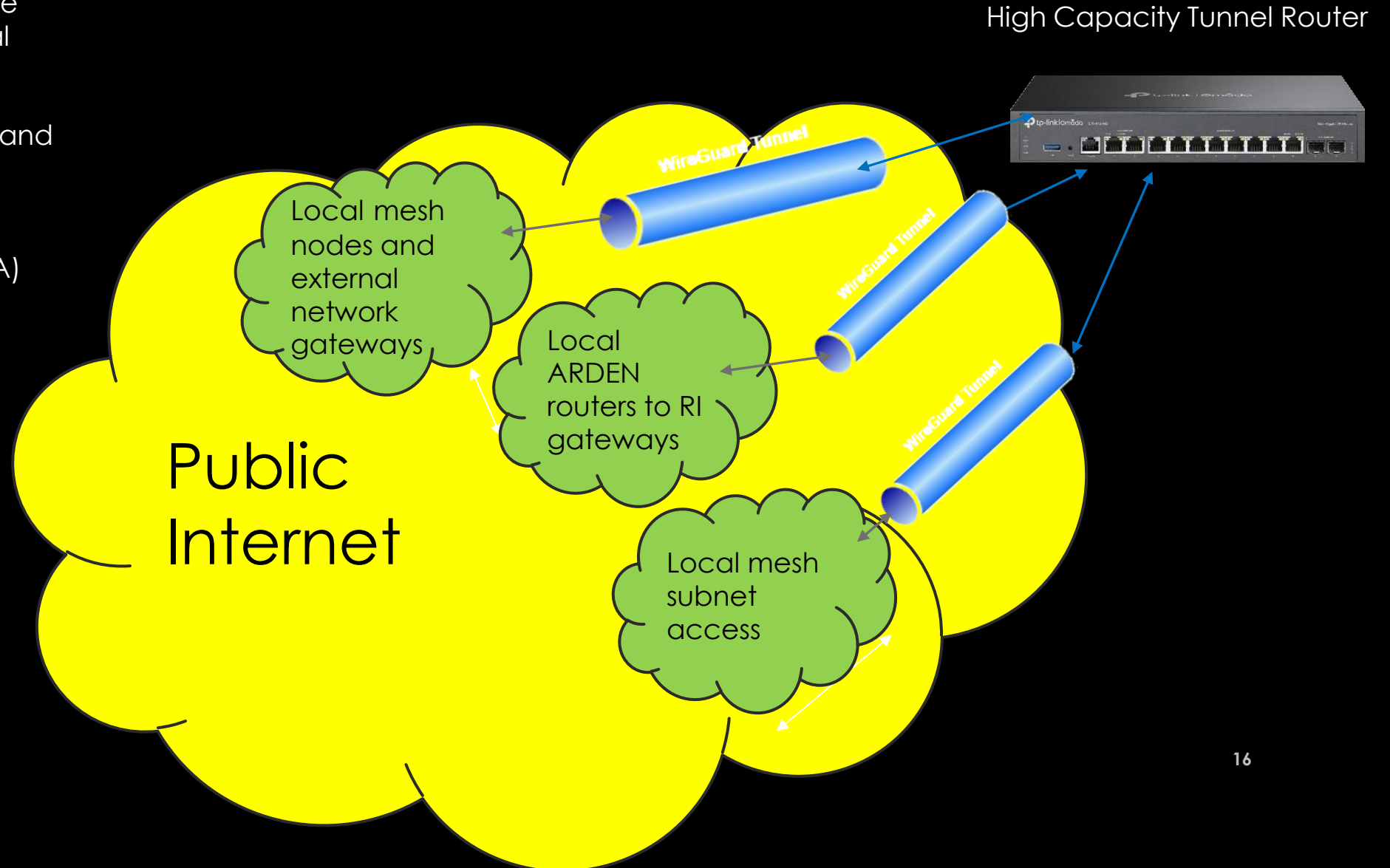
AB1OC SUPERNODE



Secure WireGuard internet tunnel to the New England Digital Emergency Communications Network (NEDECN) and beyond via the Merrimack Valley Amateur Radio Association (MVARA)



Intent is that when the RF network is built out, RF will replace internet tunnel access



WW3SWJ Access to AB1OC's Network

10/2/26, 10:11 AM

WA3SWJ-Brewster-MA-TUN status

WA3SWJ-Brewster-MA-TUN

status

AREDN

Connection to the MVARA mesh network

description

10:05 am

time (ntp)

30 days, 0:39

uptime

0.09 0.10 0.09

load average

9.14 MB 14.98 MB

free flash free ram

4.26.1.0

Update available

firmware version

issues

release notes

NETWORK

10.71.247.172 / 32

mesh address

10.63.189.97 / 29

lan address

10.0.67.101 / 24

wan address (dhcp)

10.0.67.1

wan gateway

8.8.8.8 8.8.4.4

dns

LOCAL SERVICES

wa3swj-mt-nvr

LOCAL DEVICES

m900-spare01

LOCAL NODES

	rx	rtt	snr	n snr	errors	mbps	miles
None							

NEIGHBORHOOD NODES

ab1oc-ne-tgw1	100%	30	-	-	0%	-	102.8
---------------	------	----	---	---	----	---	-------

RADIO

MikroTik RouterBOARD 952Ui-5ac2nD (hAP ac lite)

model

MESH

145	242	56
nodes	devices	services

LAN DHCP

Active

status

10.63.189.97 / 29	10.63.189.98 - 10.63.189.102
gateway	range

wa3swj-brewster-ma-tun.local.mesh/a/status

1/1

AB1OC's Tunnel Gateway#1

10/2/26, 10:13 AM

AB1OC-NE-TGW1 status

AB1OC-NE-TGW1 status

lan address

192.168.92.140 / 24

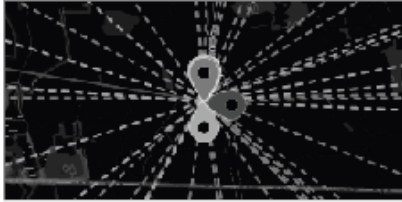
wan address (dhcp)

192.168.92.1

wan gateway

192.168.92.1 192.168.92.1

dns



42.71180, -71.59010
location

FN42er

ad1oc-ne-tgw5 100% 0%
ab1oc-ne-tgw6 100% 0%
n1mva-hollis-nh-msn 100% 0%

NEIGHBORHOOD NODES

ab1oc-hollis-nh-tun1	100%	0	-	-	0%	-	<1
ab1oc-hollis-nh-tun2	100%	0	-	-	0%	-	<1
ab1oc-hollis-nh-tun3	100%	1	-	-	0%	-	<1
ab1oc-hollis-nh-tun4	100%	1	-	-	0%	-	<1
ab1oc-hollis-nh-tun5	100%	1	-	-	0%	-	<1
ab1oc-hollis-nh-tun6	100%	1	-	-	0%	-	<1
ab1oc-hollis-nh-tun7	100%	0	-	-	0%	-	<1
k1ehz-bedford-nh-tun	100%	28	-	-	0%	-	15.5
kb1jfg-doug-ma	100%	32	-	-	0%	-	48.7
kc1dxl-littleton-ma-tun	100%	20	-	-	0%	-	13.4
kc1ggx-northfield-nh-tun	100%	27	-	-	0%	-	50.0
kc1tlf-tyngsboro-ma-tun	100%	28	-	-	0%	-	8.5
kc1uix-kennebunk-me-tun	100%	34	-	-	0%	-	70.9
kd1ha-lakewoodranch-fi	100%	49	-	-	0%	-	1214.5
kd1ha-pvd-wi-hosp	100%	30	-	-	0%	-	62.9
ne1b-hudson-nh-tun	100%	29	-	-	0%	-	12.4
nm1z-cataumet1-ma-tun	100%	27	-	-	0%	-	87.3
w1eml-tyngsboro2-ma-tun	100%	19	-	-	0%	-	7.2
w1wci-nandover-ma-tun	100%	26	-	-	0%	-	24.8
w1xmm-antrim-nh-tun	100%	5	-	-	0%	-	29.8
w3cx-lorton-va-tun	100%	37	-	-	0%	-	402.5
wa3swj-brewster-ma-tun	100%	32	-	-	0%	-	102.8

RADIO

QEMU PC

model

ab1oc-ne-tgw1.local.mesh/va/status

1/1

AB1OC's Supernode

10/2/26, 10:16 AM

AB1OC-NE-SUPERNODE status

AB1OC-NE-SUPERNODE status

AREDN.

New England Supernode running in the Proxmox Cluster at AB1OC

description

10:15 am

edt (ntp)

1 day, 22:53

uptime

0.50 0.48 0.38

load average

68.796 MB

335.46 MB

free flash

free ram

4.26.7.0

Up to date

firmware version

issues

release notes

NETWORK

10.62.174.177 / 32

mesh address

10.245.117.137 / 29

lan address

192.168.91.140 / 24

wan address (dhcp)

192.168.91.1

wan gateway

192.168.91.1 192.168.91.1

dns

LOCAL SERVICES

None

LOCAL DEVICES

None

LOCAL NODES

	rx	rtt	snr	n snr	errors	mbps	miles
ab1oc-hollis-nh-hlw0	100%				0%		
ab1oc-ne-sgw	100%				0%		
ab1oc-ne-tgw1	100%				0%		
ab1oc-ne-tgw2	100%				0%		
ab1oc-ne-tgw3	100%				0%		
ab1oc-ne-tgw4	100%				0%		
ab1oc-ne-tgw5	100%				0%		
ab1oc-ne-tgw6	100%				0%		
n1mva-hollis-nh-msn	100%				0%		

NEIGHBORHOOD NODES

hb9bla-basel-supernode	100%	143	-	-	0%	-	3712.2
k1rks-supernode-washco	100%	77	-	-	2%	-	2505.3
k1vl-shrewsburyvt-supernode	100%	31	-	-	0%	-	82.5
ku7pdx-hio-supernode	100%	81	-	-	0%	-	2513.0
m0mfs-eng-supernode	100%	99	-	-	0%	-	3120.5
n2mh-supernode-oki	100%	41	-	-	0%	-	702.9
nc8q-oh-supernode	100%	30	-	-	0%	-	684.5
sk3ga-sm-supernode	100%	125	-	-	0%	-	3644.5
ta2dmx-supernode	100%	97	-	-	0%	-	4844.2
ve3kpg-kawartha-supernode	100%	101	-	-	0%	-	348.7
wf0f-nl-supernode	100%	44	-	-	0%	-	4067.0

ab1oc-ne-supernode.local.mesh/a/status

1/1

AB1OC's Tunnel Gateway#4

10/2/26, 10:03 AM

AB1OC-NE-TGW4 status

AB1OC-NE-TGW4 status

AREDN

New England Tunnel Gateway #4
(New England Mesh Connections)

description

10:02 am

edit (ntp)

1 day, 22:41

uptime

0.00 0.00 0.00

load average

68.808 MB

159.932 MB

free flash

free ram

4.26.7.0

Up to date

firmware version

issues

release notes

NETWORK

10.150.175.52 / 32

mesh address

10.181.121.161 / 29

lan address

192.168.95.140 / 24

wan address (dhcp)

192.168.95.1

wan gateway

1.1.1.1 1.0.0.1

dns

LOCAL SERVICES

None

LOCAL DEVICES

None

LOCAL NODES

	rx	rtt	snr	n snr	errors	mbps	miles
ab1oc-hollis-nh-hlw0	100%				0%		
ab1oc-ne-sgw	100%				0%		
ab1oc-ne-supernode	100%				0%		
ab1oc-ne-tgw1	100%				0%		
ab1oc-ne-tgw2	100%				0%		
ab1oc-ne-tgw3	100%				0%		
ab1oc-ne-tgw5	100%				0%		
ab1oc-ne-tgw6	100%				0%		
n1mva-hollis-nh-msn	100%				0%		

NEIGHBORHOOD NODES

k1ui-yarmouthport-ma-tun	100%	31	-	-	0%	-	98.3
ke5yim-orange-ct-tun	100%	25	-	-	0%	-	124.3
w1lem-brewster-ma-tun	100%	34	-	-	0%	-	102.5
ww1rf-dennis-ma-tun	100%	30	-	-	0%	-	98.7

RADIO

QEMU PC

model

ab1oc-ne-tgw4.local.mesh/a/status

1/1

20

WW1RF Access Via RF and Tunnel

10/3/26, 6:02 AM

WW1RF-Dennis-MA-TUN status

WW1RF-Dennis-MA-TUN

status

AREDN

None

description

10:00

time (ntp)

22 days, 0:02

uptime

0.06 0.06 0.04

load average

9.14 MB

free flash

8.996 MB

free ram

4.26.1.0

Update available

firmware version

issues

release notes

LOCAL SERVICES

None

LOCAL DEVICES

None

LOCAL NODES

	rx	rtt	snr	n snr	errors	mbps	miles
ww1rf-dennis-ma-node-01	100%				0%		

NEIGHBORHOOD NODES

ab1oc-ne-tgw4	100%	33	-	-	0%	-	98.7
ww1rf-dennis-ma-node-01	100%	2	38	29	0%	9.8	< 1
e4:38:83:b4:5f:26	50%	-	23	-	17%	19.6	-

HIDDEN NODES

wa3swj-dennis-ma-node-6

RADIO

MikroTik RouterBOARD 952Ui-5ac2nD (hAP ac lite)

model

MESH

162

channel

0 dBm

tx power

5805 - 5815 MHz

frequencies

0 miles

maximum distance (actual)

10 MHz

bandwidth

NETWORK

10.96.194.1 / 32

mesh address

10.6.16.9 / 29

lan address

192.168.1.92 / 24

wan address (dhcp)

192.168.1.1

wan gateway

8.8.8.8 8.8.4.4

dns

W1LEM Tunnel Only

10/2/26, 10:00 AM

W1LEM-BREWSTER-MA-TUN admin

W1LEM-BREWSTER-MA-TUN

admin

AREDN

-

notes

2:00 pm

utc (ntp)

23 days, 21:40

uptime

0.18 0.13 0.05

load average

8.6 MB

free flash

9.352 MB

free ram

4.26.7.0

Up to date

firmware version

issues

release notes

0

installed packages

NETWORK

10.71.250.101 / 32

mesh address

10.63.211.41 / 29

lan address

10.0.0.198 / 24

wan address (dhcp)

10.0.0.1

wan gateway

8.8.8.8 8.8.4.4

dns

active Cloud Mesh

disabled Hardware Watchdog

active IPerf3 Server

active WAN telnet

active Wireless Watchdog

disabled PoE out

active Metrics

disabled Remote Logging

active WAN ssh

active WAN web

active ID Beacon

active USB power out

LOCAL SERVICES

None

LOCAL DEVICES

Als-Gift-Laptop

LOCAL NODES

rx rtt snr n snr errors mbps miles

None

NEIGHBORHOOD NODES

ab10c-ne-tgw4

100%

31

-

-

0%

-

102.5

RADIO

MikroTik RouterBOARD 952Ui-5ac2nD (hAP ac lite)

model

MESH

149

channel

19 dBm

tx power

5740 - 5750 MHz

frequencies

50.1 miles

maximum distance (actual)

10 MHz

bandwidth

ANTENNA

w1lem-brewster-ma-tun.local.mesh/a/status

1/1

FINIS

QUESTIONS?

- FOR FOLLOW-UP DISCUSSION OR TO JOIN THE TEAM (PLEASE)
- CONTACT W1LEM (INFO ON BARC WEBSITE AND [QRZ](#))