Andreas, HB9BLA

The First Joined Swiss TCP/IP Network Convention

Agenda

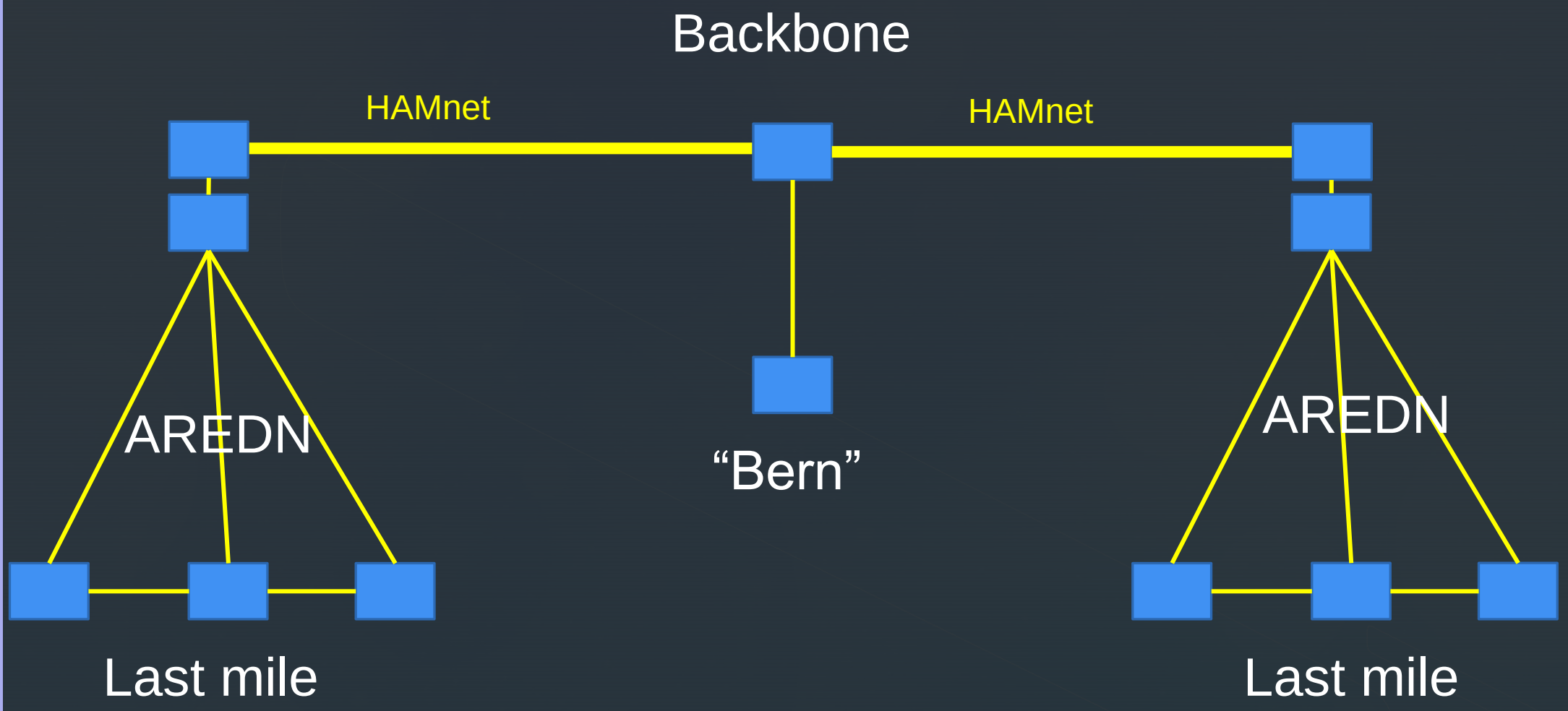
- 10:00 Welcome
- 10:05 One Swiss TCP/IP network (HB9BLA)
- 10:30 Introduction to HAMnet and AREDN (HB9BLA)
- 11:00 Break
- 11:15 HAMnet / AREDN status and projects (Participants)
- AREDN demo (if time permits)
- 12:00 New management of VOIP on AREDN networks (HB9HDH)
- 12:30 Lunch
- 13:30 Swiss Communication Competency Center Tour (S. Junker)
- Apero

One Swiss TCP/IP network

Andreas, HB9BLA

One Integrated Network

- Wireless
- Independent from the internet
- TCP/IP based (nearly…)
- Emergency power capable (as a goal)
- High-speed backbone
- Incl. DMR (voice), WinLink, LoRa Mesh, etc.
- Maybe also satellite communication


Backbone
HAMnet
HAMnet
AREDN
"Bern"
AREDN
Last mile
Last mile

HAMnet

MeshCom Netzwerk

AREDN

AREDN

Winlink Station

DMR Relay

Winlink Station

Focussed Implementation

1. Emergency communication groups: Usually organized in local organizations
2. Technology group (HAMnet/AREDN, etc.): Coordinated across Switzerland
3. Maybe a “packaging group” (hardened, emergency power)

→ Service catalog as an interface

HAMnet

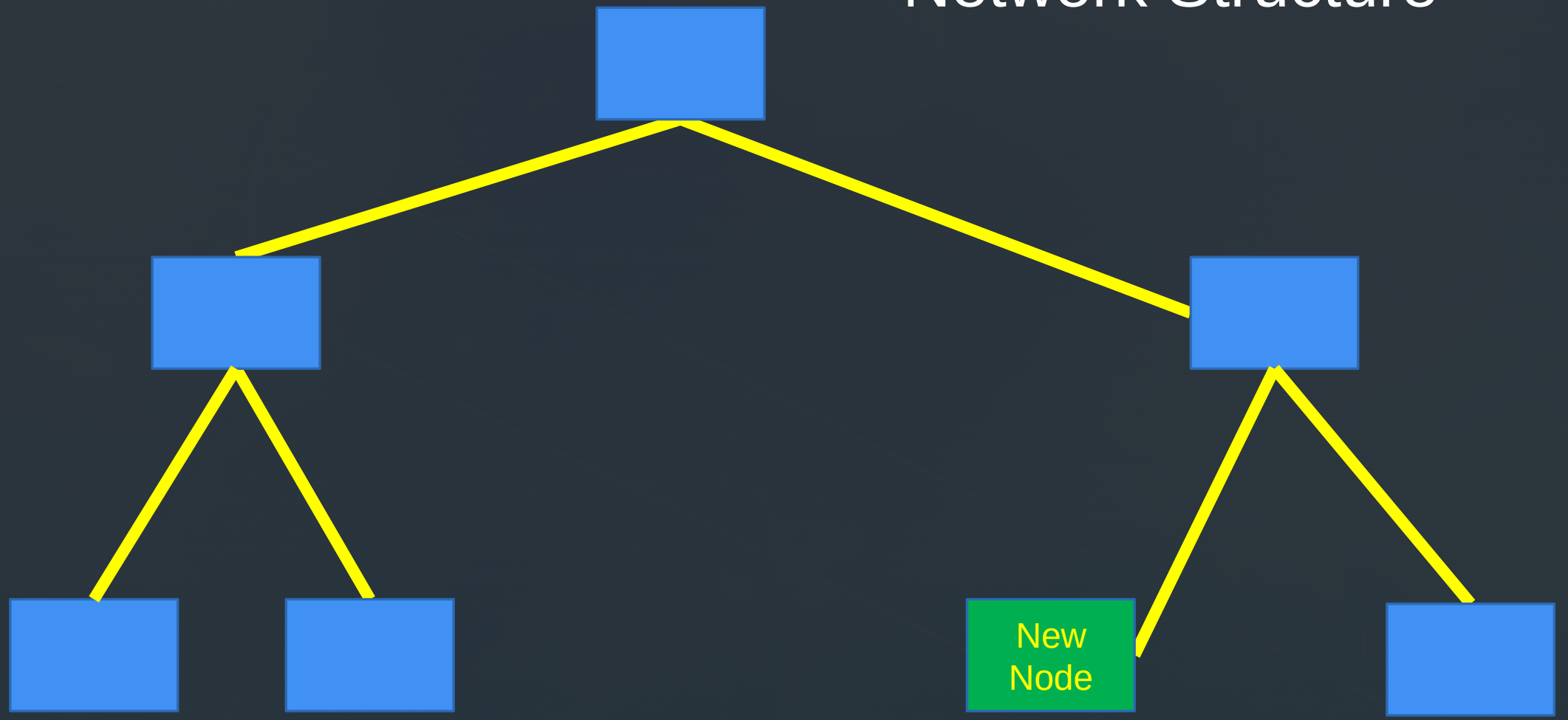
What is HAMnet?

- Highspeed Amateurradio Multimedia NETwork
- In 1981, we got the 44.0.0.0/8 address range of the internet (which was partly sold in 2019)
- The Swiss address range is: 44.142.0.0 - 44.142.255.255
- TCP-IP based, **hierarchical**, and managed like an ordinary network
- Used by services like EchoLink, WinLink2000, Instant Messaging, VoIP, DATV/ IP ATV and APRS
- In Switzerland it operates mainly on 5.7GHz

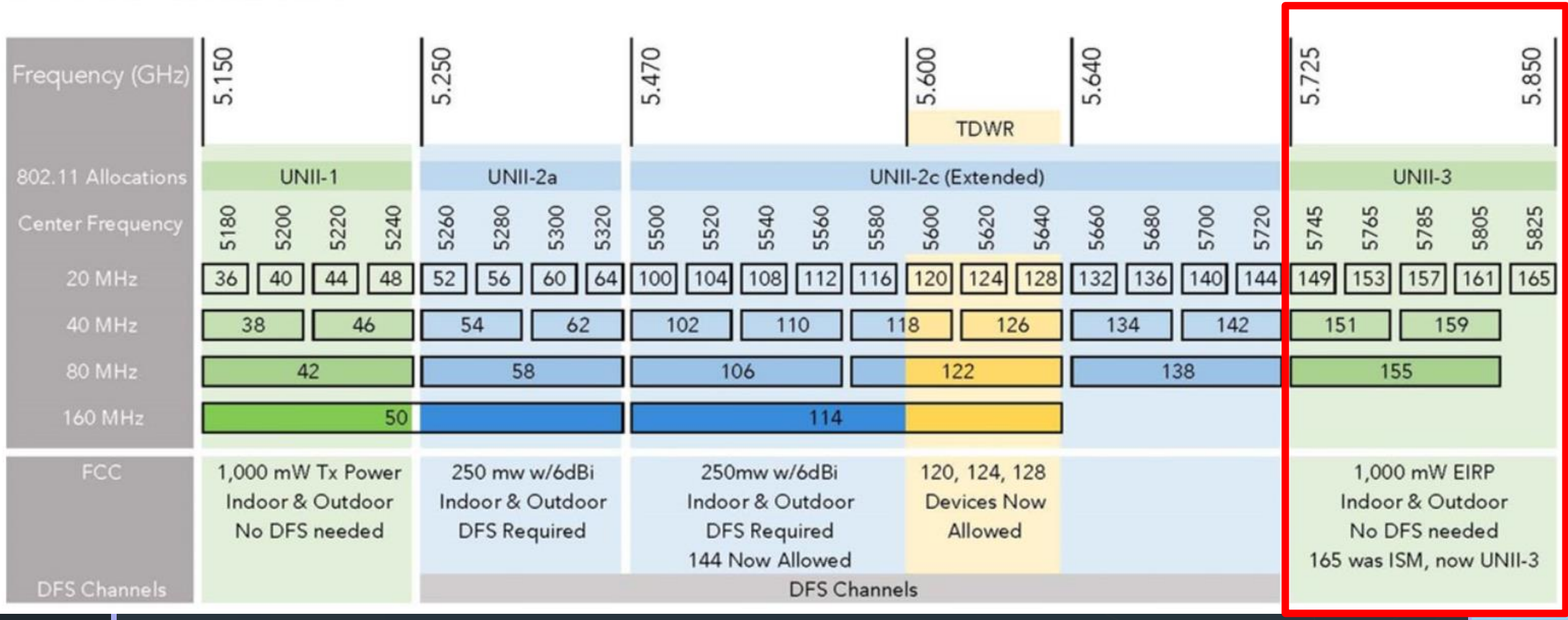
What is HAMnet?

- Adresses are managed by Markus Müller, HB9CTB
- Frequencies are managed by Renato Schlittler, HB9BXQ
- Standard routers and RF equipment are used
- Standard router software is used
- Access through VPN or a wireless link

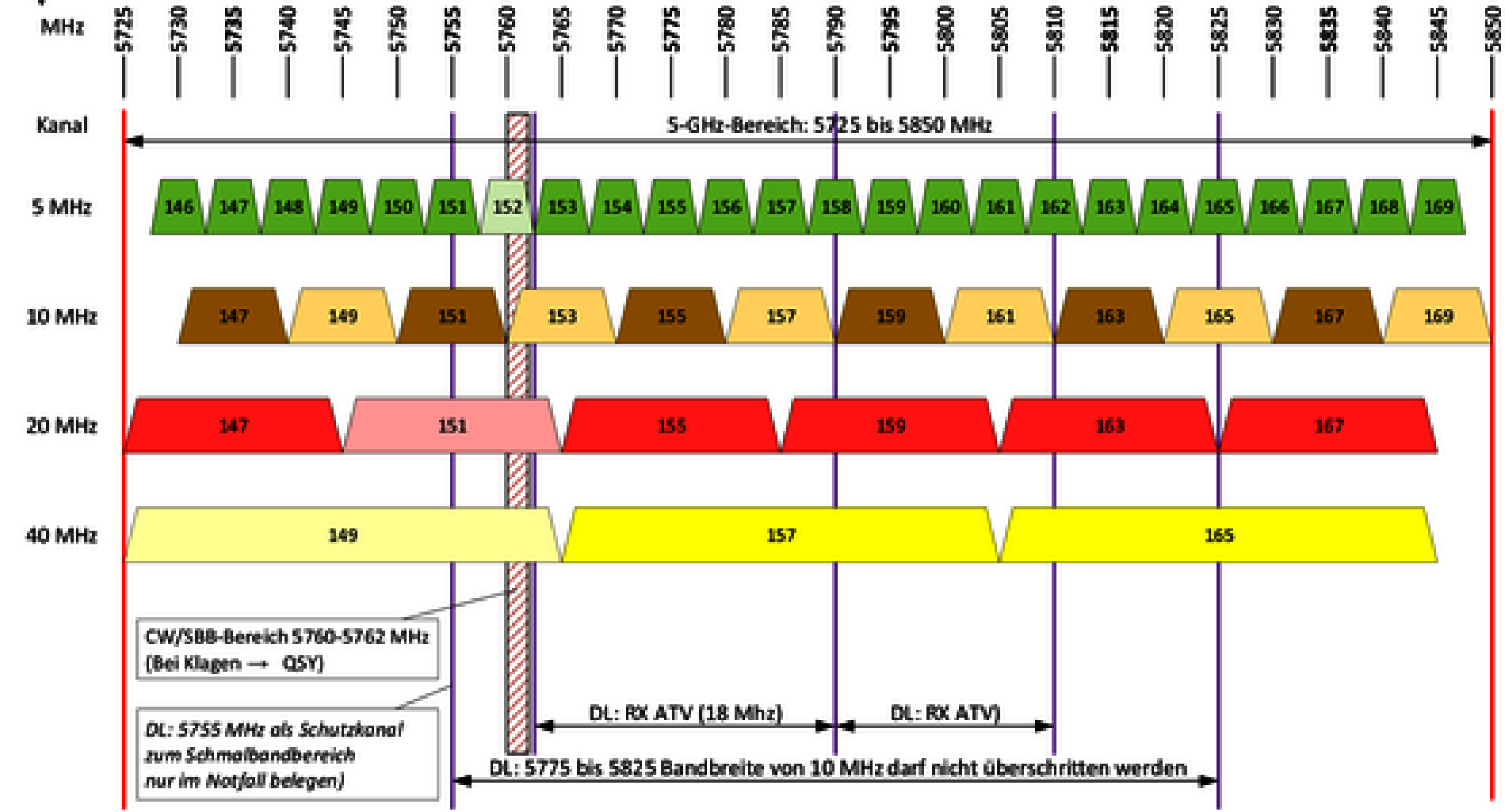
Network Structure



5 GHz Channel Allocations



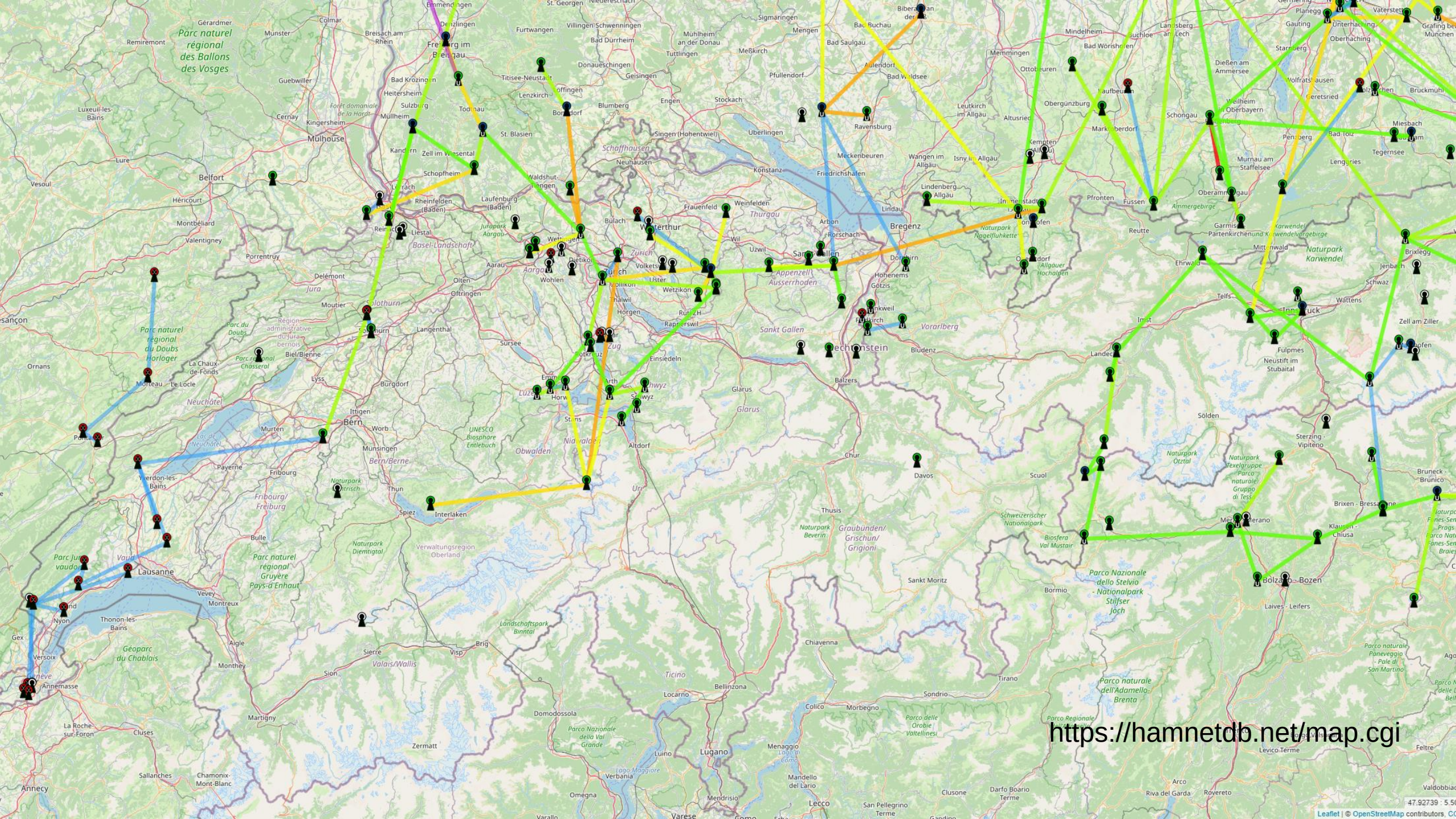
HB9-HAMNET-Bandplan 2015



USKA Frequenzkoordination: Bandplan vom 16.12.2010, ergänzt am 08.09.2015 (von HB9BXQ und HB9CZF)
DARC-Bandplan Stand 11/2013: Bandbreiten von 10 MHz dürfen nicht überschritten werden.
HB9: Im 10-MHz-Raster sollten die sich mit dem 20-MHz-Raster überschneidenden Kanäle nicht genutzt werden

Source: SwissARTG

Gezeichnet: HB9CJD 17.03.2022


https://hamnetdb.net/map.cgi
Leaflet | © OpenStreetMap contributors, CC

Site hb9zrh - Hamnet IP-Database - hamnetdb.net - Google Chrome

hamnetdb.net/index.cgi?q=hb9zrh

AS | Sites | Hosts | Subnets | Utilities | Last changes | Help | Login

Search hb9zrh AS: -All- Refresh

Site hb9zrh (Uetliberg (Uto))

Show: Map | Fullscreen Map

Coordinates: 47.349580,8.490790 - 47°20.97' N 8°29.45' E - 47°20'58" N 8°29'26" E - JN47FI83VV
Elevation: 12 m above ground

Maintainer: **hb9pae, hb9ctb**

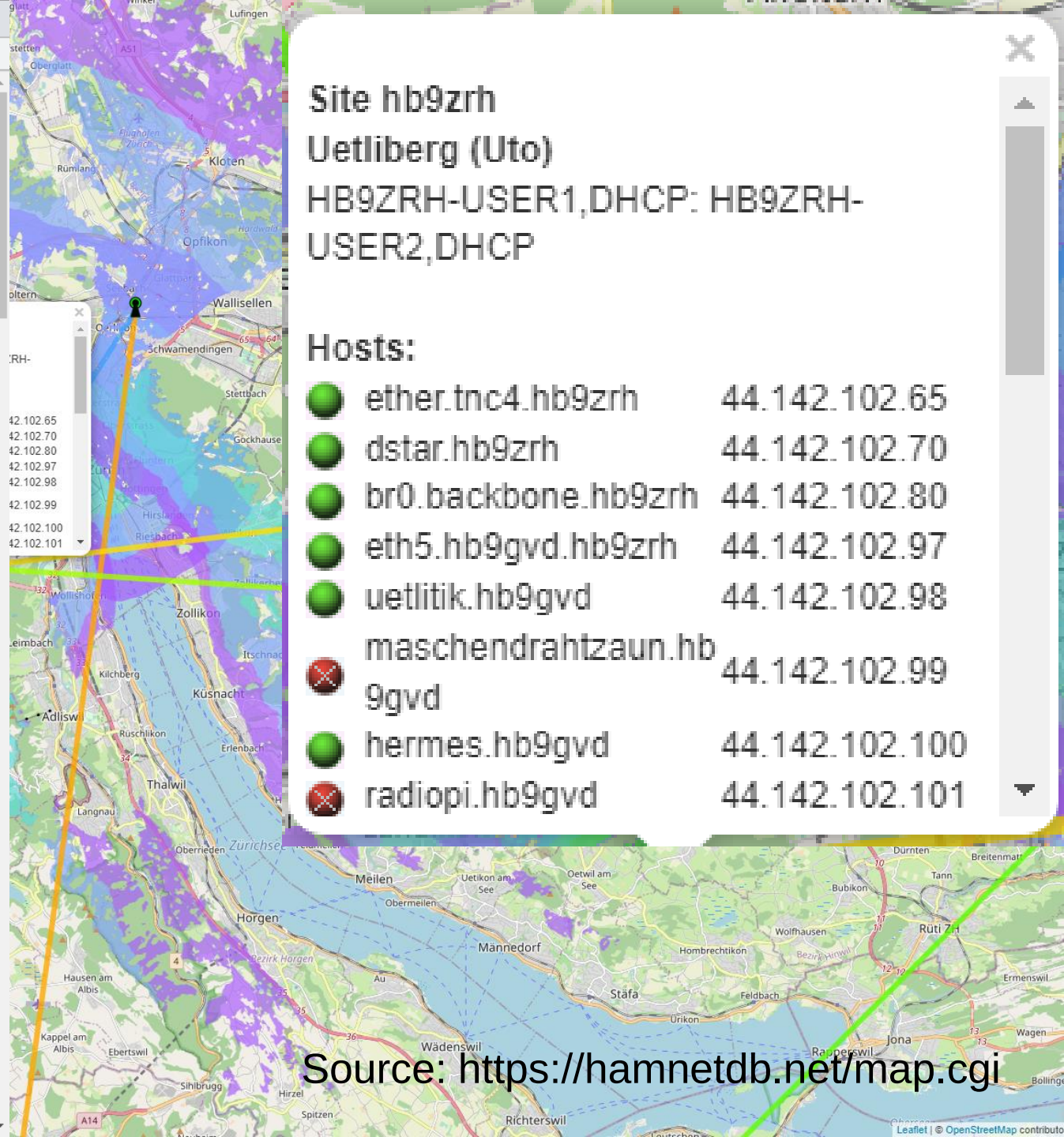
User access: **HB9ZRH-USER1,DHCP: HB9ZRH-USER2,DHCP**

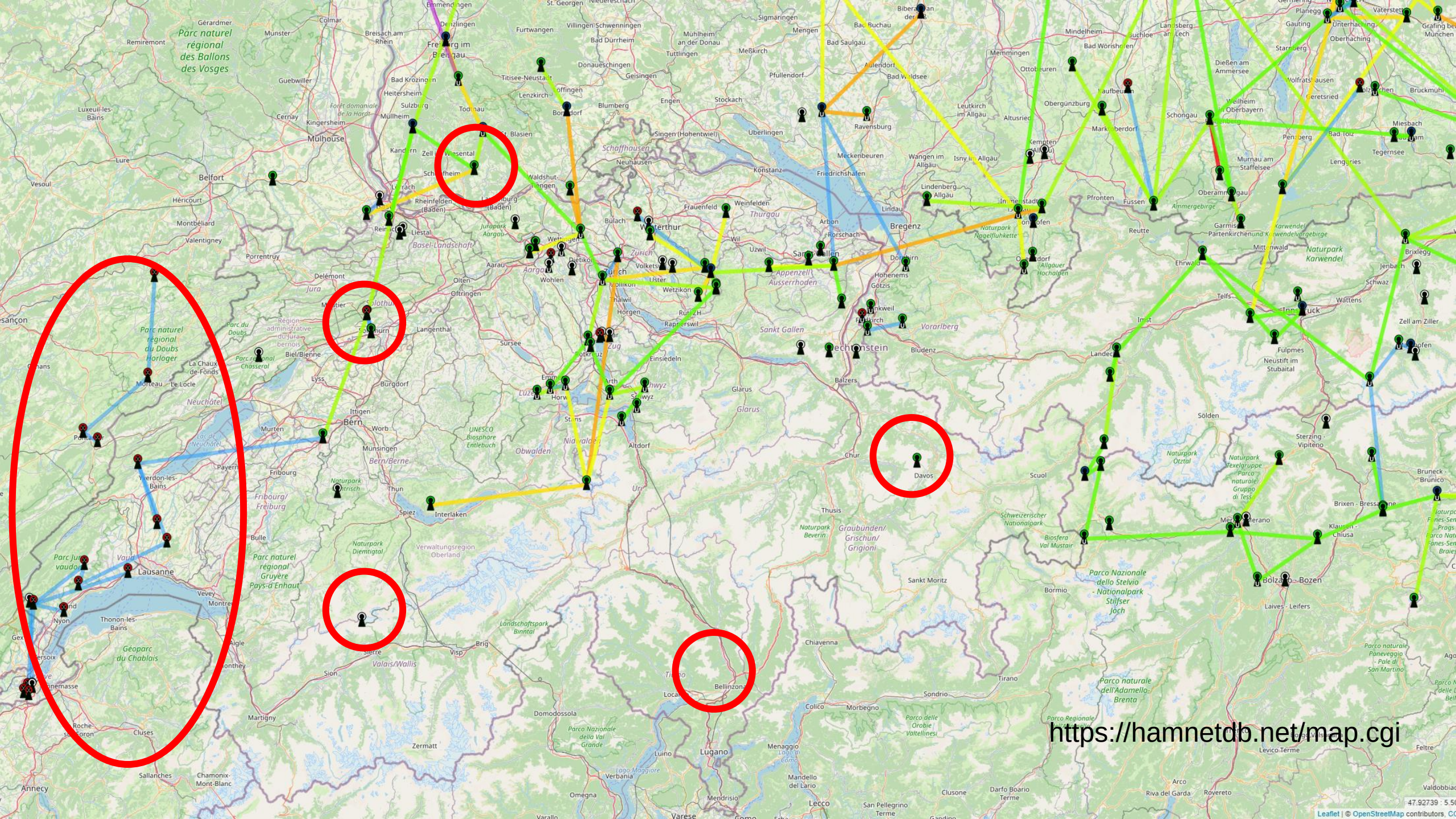
Antenna-configuration:

HB9ZRH-U2 Typ: **ubnt-120deg5G19-V** Azimuth: **20°** Elevation: **-1°** Frequency: **5775** MHz
HB9ZRH-U1 Typ: **ubnt-OMNI2G13-V** Azimuth: **0°** Elevation: **-1°** Frequency: **5755** MHz

*Last edited 2021-06-30 by **hb9pae***

hb9zrh (Uetliberg (Uto)) eth2.hb9zg-20.hb9zrh 44.142.255.206 Link zu HB9ZG-HU Hünenberg	Backbone-Network 44.142.255.200/29 Link HB9ZG-20 Hünenberg - HB9ZRH Uetliberg -67.2 dBm / -67.5 dBm	hb9zg-20 (Hünenberg) bb-hb9zrh.hb9zg-20 44.142.255.201 Link zu HB9ZRH Uto 19.4km - 194.1° - Show in Linktool
hb9zrh (Uetliberg (Uto)) eth8.hb9am.hb9zrh 44.142.255.177 Link zu HB9AM/Lägern	Backbone-Network 44.142.255.176/29 Link Lägern - Uetliberg -65 dBm / -63 dBm	hb9am-30 (Lägern) bb-hb9zrh.hb9am-30 44.142.255.182 Link Lägern <-> HB9ZRH (Uetliberg) 16.3km - 334.8° - Show in Linktool
hb9zrh (Uetliberg (Uto)) eth4.hb9nf-1.hb9zrh 44.142.254.137	Backbone-Network 44.142.254.136/29 -68 dBm / -68.9 dBm	hb9nf-1 (Warte ZH - WART) eth3.hb9zrh.hb9nf-1 44.142.254.142 Uetliberg 35.5km - 93.6° - Show in Linktool
hb9zrh (Uetliberg (Uto)) eth3.hb9nf.hb9zrh 44.142.254.118	Backbone-Network 44.142.254.112/29 -76 dBm / -77.8 dBm	hb9nf (Sternenberg - STBG) bb-hb9zrh.hb9nf 44.142.254.113 32.2km - 82.8° - Show in Linktool
hb9zrh (Uetliberg (Uto)) eth6.rtr.hb9zrh 44.142.249.65	Backbone-Network 44.142.249.64/29	hb9nf-2 (Zürich Oerlikon - ZOER) rtr.eth2.hb9nf-2 44.142.249.70 8.6km - 32.4° - Show in Linktool




https://hamnetdb.net/map.cgi

User Access

Hörnli

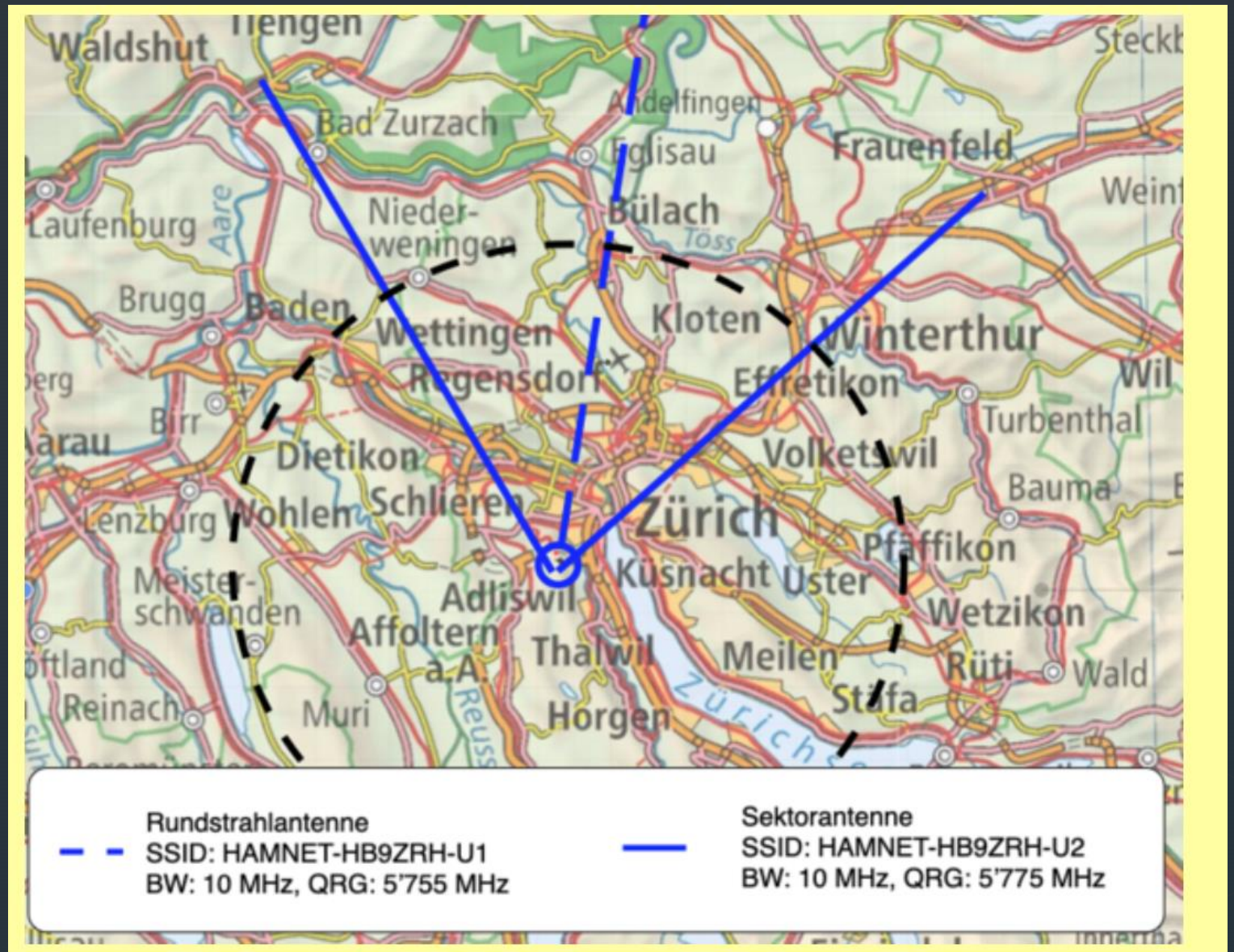
HB9AK, User 1

Antenne:	AirGrid, 23dBi
Antennenrichtung:	350° +/-10°, vertikal
Frequenz / Kanal:	5'815 MHz / 163
WLAN SSID:	HB9TG
Client IP-Adresse:	automatisch (DHCP)
Sysop:	hb9pae@swiss-artg.ch

Source: SwissARTG

	Panel-Antenne 23dBi
	305° +/-10°, vertikal
Frequenz / Kanal:	5'735 MHz / 147
WLAN SSID:	HB9AK-Winterthur
Client IP-Adresse:	automatisch (DHCP)
Sysop:	hb9pae@swiss-artg.ch

Üetliberg



Source: SwissARTG

Typical Clients

- Ubiquiti airMAX NanoStation 5AC loco, 13 dBi, ca. 50 CHF
- Ubiquiti airMAX NanoStation AC5,16 dBi, ca. 130 CHF
- Ubiquiti airMAX LiteBeam AC 5 GHz, 23 dBi, ca. 65 CHF
- Or VPN: vpnadmin@swiss-artg.ch

Source: SwissARTG

AREDN

What is AREDN?

- Amateur Radio Emergency Data Network
- Highspeed Amateur Radio **Mesh** NETwork
- Completely independent from the internet
- The Swiss address range is 10.xxx.xxx.xxx and is assigned automatically
- TCP-IP based, self-managed
- Used by services like VOIP, WinLink2000, and other services
- In Switzerland it operates on 5.7GHz

What is AREDN?

- All nodes in one mesh on the same frequency
- Address management by the network
- Frequencies of fixed nodes are managed by Renato Schlittler, HB9BXQ
- Standard routers and RF equipment is used, but only a list of devices are supported
- It uses a special firmware on the nodes
- Access through VPN or a wireless link

Supported Platform Matrix

The supported platform matrix identifies the make and models of hardware which may be used with AREDN firmware in the various frequency bands equipment marked with a green background is fully supported and tested. Models with a red background are NOT supported nor are they compatibl AREDN firmware. The orange background indicates equipment that will be sunsetted in a future firmware release (meaning no more new firmware b these devices). Equipment with a yellow background is in the research stage and may or may not achieve fully-supported status depending on test r

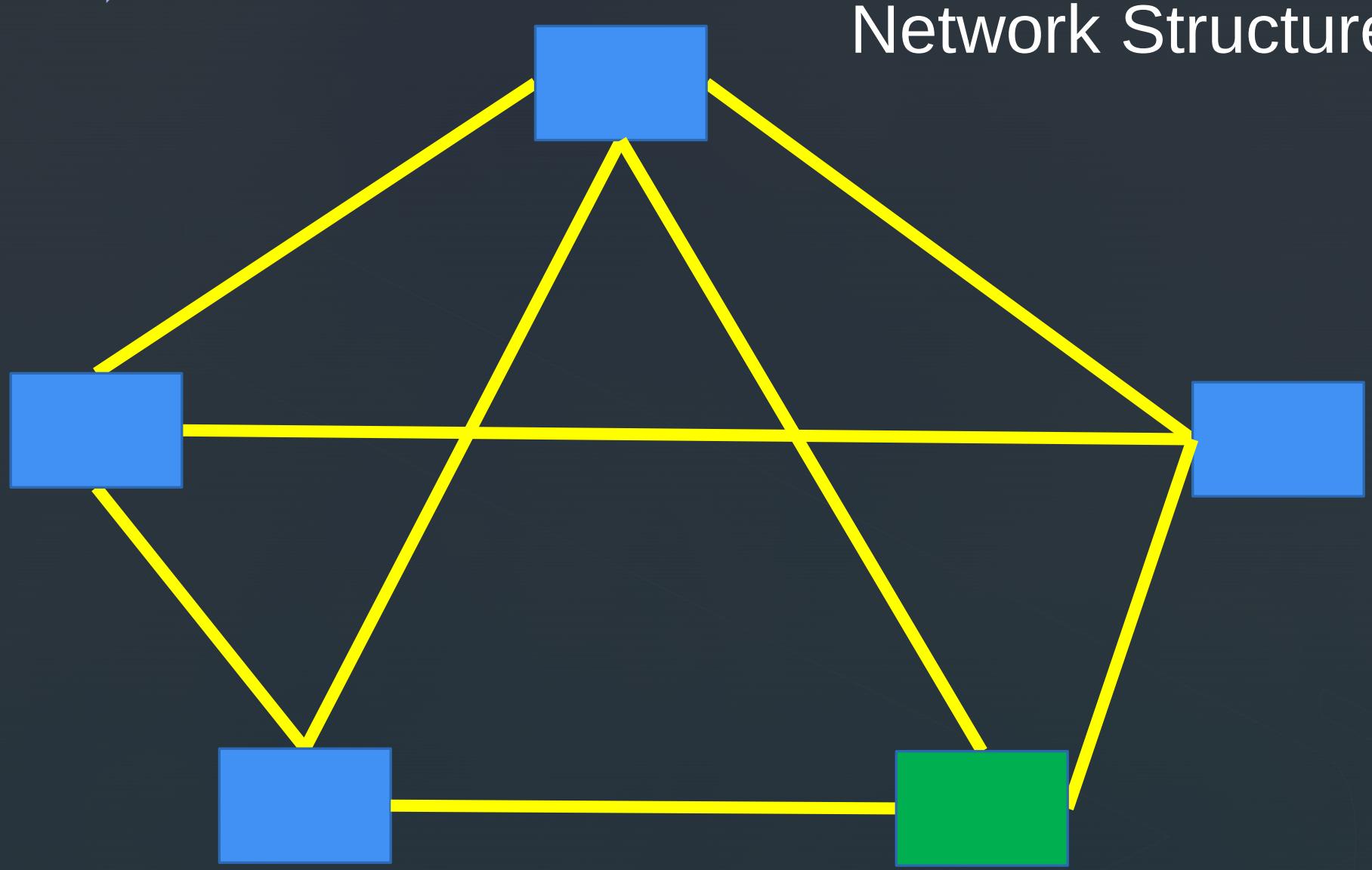
In the table below, if the model is a link (BOLD TEXT), we've linked those to Amazon for your convenience. As an Amazon Associate AREDI from qualifying purchases.

Current As of AREDN™ 3.22.12.0 (updated on 12/19/2022)				
	Band			
Manufacturer/Model	900Mhz	2.4Ghz	3Ghz [5]	5.8Ghz
Mikrotik (www.mikrotik.com)				
LHG (Lite Head Grid)		**RBLHG-2nD**		**RBLHG-5nD**
LHG HP/XL		RBLHG-2nD-XL		**RBLHG-5HPnD-X**
LHG HP				RBLHG-5HP
Basebox		**RB912UAG-2HPnD**		**RB912UAG-5HPnD**
hAP AC Lite (and TC)		**RB952Ui-5ac2nD**		**RB952Ui-5ac2nD** (AP only, no mesh)
LDF (Lite Dish Feed)		RBLDF-2nD		**RBLDF-5nD**
QRT				**RB911G-5HPnD-QRT**
SXT		SXTsq-2nD		**SXTsq-5nD** **SXTsq-5HPnD**
mANTBox		RB911G-2HPnD		RB911G-5HPnD
Ubiquiti Networks (www.ubnt.com)				
AirGrid (XM revision/old)		M2		M5
AirGrid (XW)				AG-HP-5Gxx
AirRouter		M2		
AirRouter HP		M2		
Bullet		M2		M5
Bullet Titanium		M2		M5
Bullet (XW)		M2		
LiteBeam				**M5**
NanoBeam (XW)		NBE-M2-13		NBE-M5-16/19
NanoBridge	M9	2G18	M3	5G22/5G25
NanoStation Loco (XM)	M9	M2		M5
NanoStation Loco (XW)		**M2**		M5
NanoStation (XM) Airmax		M2	**M3**	M5
NanoStation (XW) Airmax		**M2**		**M5**
PicoStation		M2		
PowerBeam [3]		**PBE-M2-400**		**PBE-M5-300 400 400ISO**
PowerBeam				**PBE-M5-620**
PowerBridge				M5
Rocket (XM)	**M900**	M2	**M3** [5]	M5
Rocket (XW)		**M2**		**M5**
Rocket Titanium (TI)		M2		M5

Each letter matters!

https://docs.arednmesh.org/

Network Structure



GUI Demo

Comparison Between AREDN and HAMnet

HAMnet

- “Hierarchical”
- Managed by admins
- Optimized capacity
- Addition of node needs coordination

AREDN

- Mesh
- Self-managed
- Lower capacity (redundancy, management traffic)
- Addition of nodes is simple

Comparison Between AREDN and HAMnet

HAMnet

- Easy to control
- Standard software
- Standard hardware
- 5.7GHz MIMO 802.11ac (potentially faster)

AREDN

- Harder to control
- Custom software
- List of supported devices
- 5.7GHz MIMO 802.11n (potentially slower)

SwissDigitalNet

swissdigitalnet

Follow

The Swiss Digital HAM Network

1 follower · 0 following

11:37 - same time

http://swissdigitalnet.com/

Block or Report

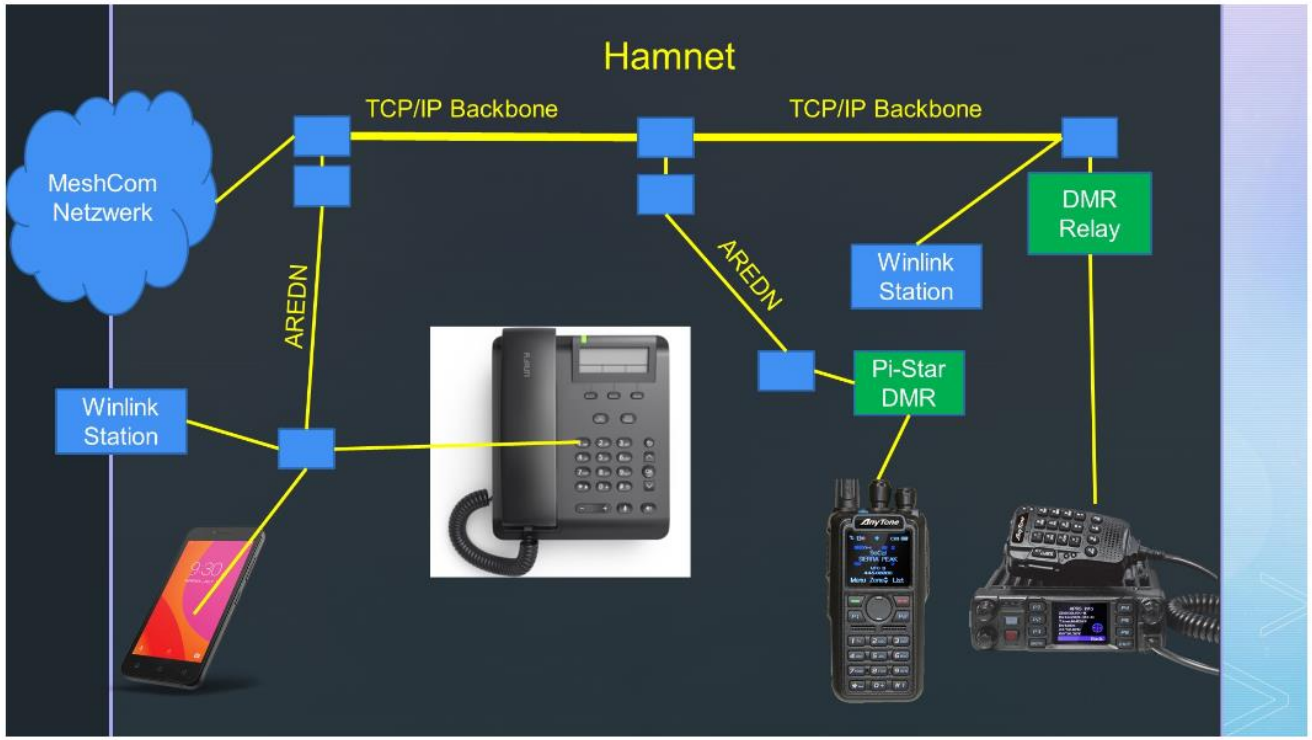
swissdigitalnet / README.md

We started to build a wirintegrated digital network for Switzerland independent from the internet. It is:

- Wireless
- Integrated. I supports end-to-end services like data transfer, mail, chat, voice, and information kiosk
- It should cover Switzerland
- and have a link to the worldwide internet (through satellites)

Its purposes are:

- Learing and fun with (mainly) TCP/IP technology, backbones, and meshes.
- Emergency network for the community
-



main 1 branch 0 tags

Go to file Add file Code Gitpod

Ph4ky Update Install Phonebook ea3e6cd on Jan 14 28 commits

Hardwaredeployment ideas	Create Hardwaredeployment ideas	5 months ago
Install Phonebook	Update Install Phonebook	last month
Phonebook on every AREDN Node	Update Phonebook on every AREDN Node	4 months ago
README.md	Update README.md	4 months ago
Remote Phonebook Yealink v1	Rename Remote Phonebook Yealink to Remote Phonebook Yealink v1	5 months ago
ip-phones	Create ip-phones	5 months ago

README.md

To do list

- Infrastructure (copy from IOTstack)
- Chat programs: (https://arednmesh.readthedocs.io/en/3.21.4.0/arednServicesGuide/chat_programs.html)
  - MatterMost (https://mattermost.com/)
  - MeshChat
- Webserver incl.
  - AREDN software distribution (https://youtu.be/vbV3JdPPBZ4)
  - Alert Messages (https://youtu.be/jURFNAHxBCM)
- Pat Winlink (https://youtu.be/_VhmhJVo3jM)
- PBX (Freeware or comercial license? Lot of knowledge in 3CX PBX)
- Address Book
- NTP server
- DuckDNS Client

About

No description, website, or topics provided.

Readme
15 stars
3 watching
5 forks

Releases

No releases published

Packages

No packages published

Contributors 2

Ph4ky Patrick H

dhamstack dHAMstack

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