



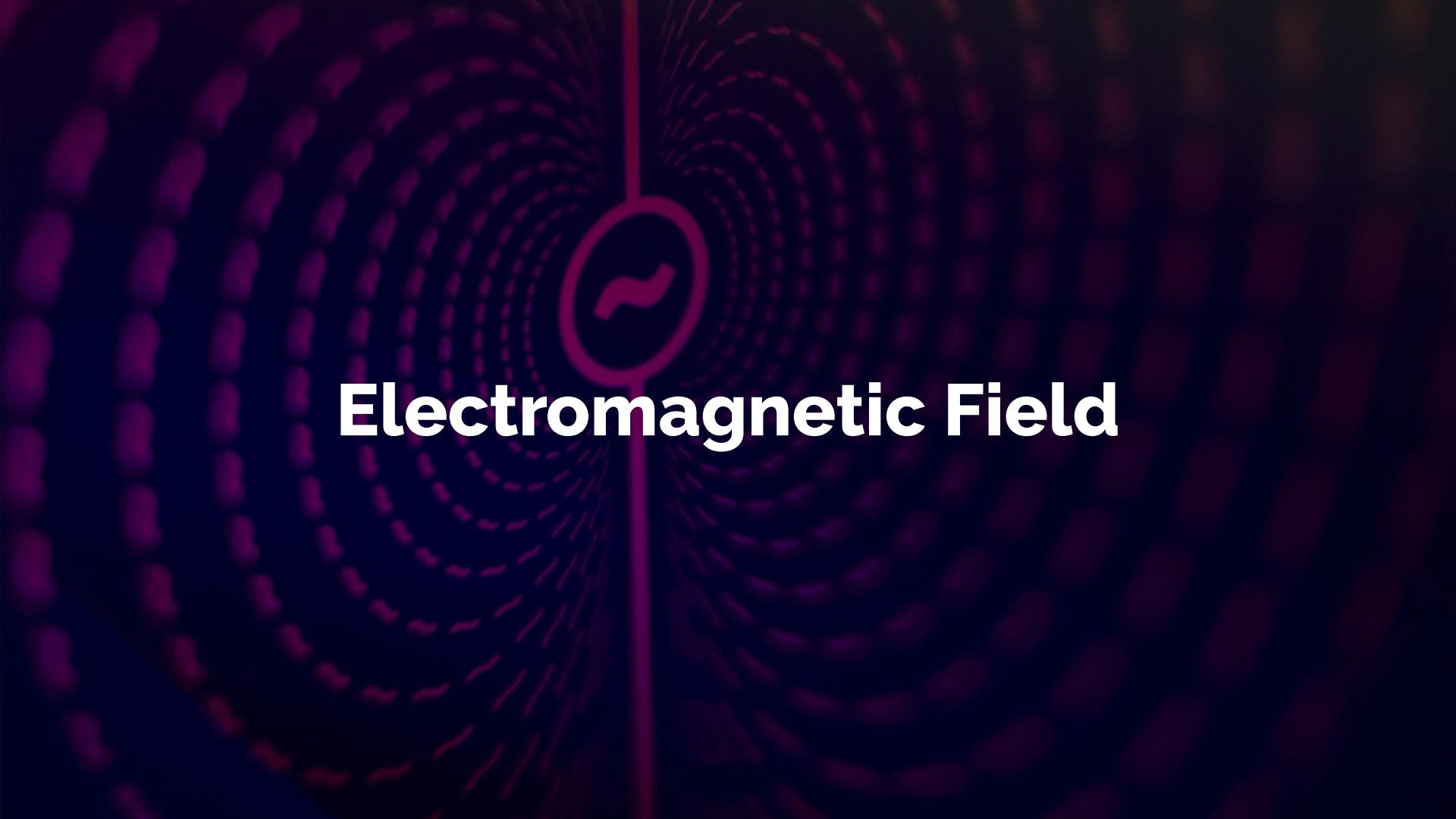
Electromagnetic Field

EMF and its Network

David Croft, EMF NOC

@emfnoc @davidcx

NetLdn, 12.12.2019



Electromagnetic Field

Impressions of EMF

A number of photographs appeared here, but have been removed from this PDF as I do not have rights to distribute them.

You can find them here:

<https://www.flickr.com/photos/chaoticeunoia/albums/72157670745765007>

<https://www.flickr.com/groups/emfcamp/>

<https://www.instagram.com/explore/tags/emfcamp/>



2012

500

2014

1200

2016

1600

2018

2500

2020

2750

EMF Attendees

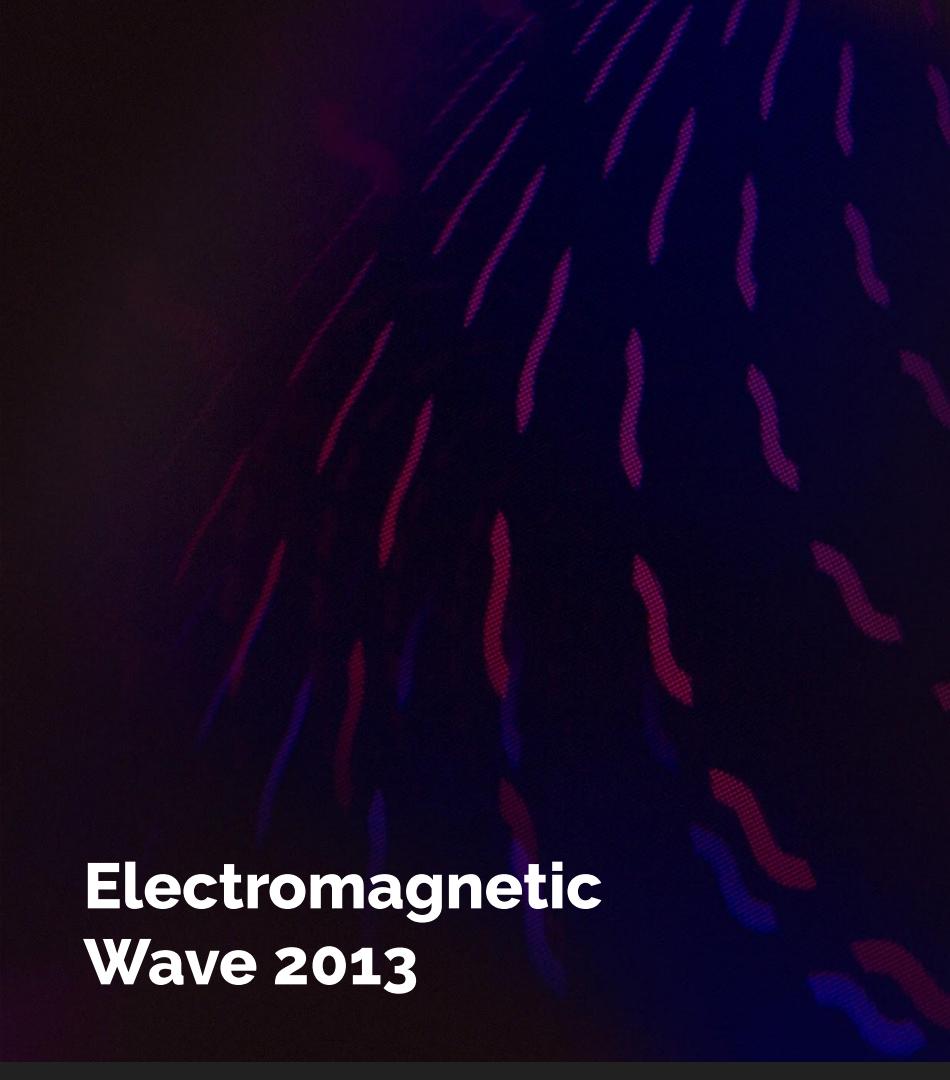


Uplink



Electromagnetic Field 2012

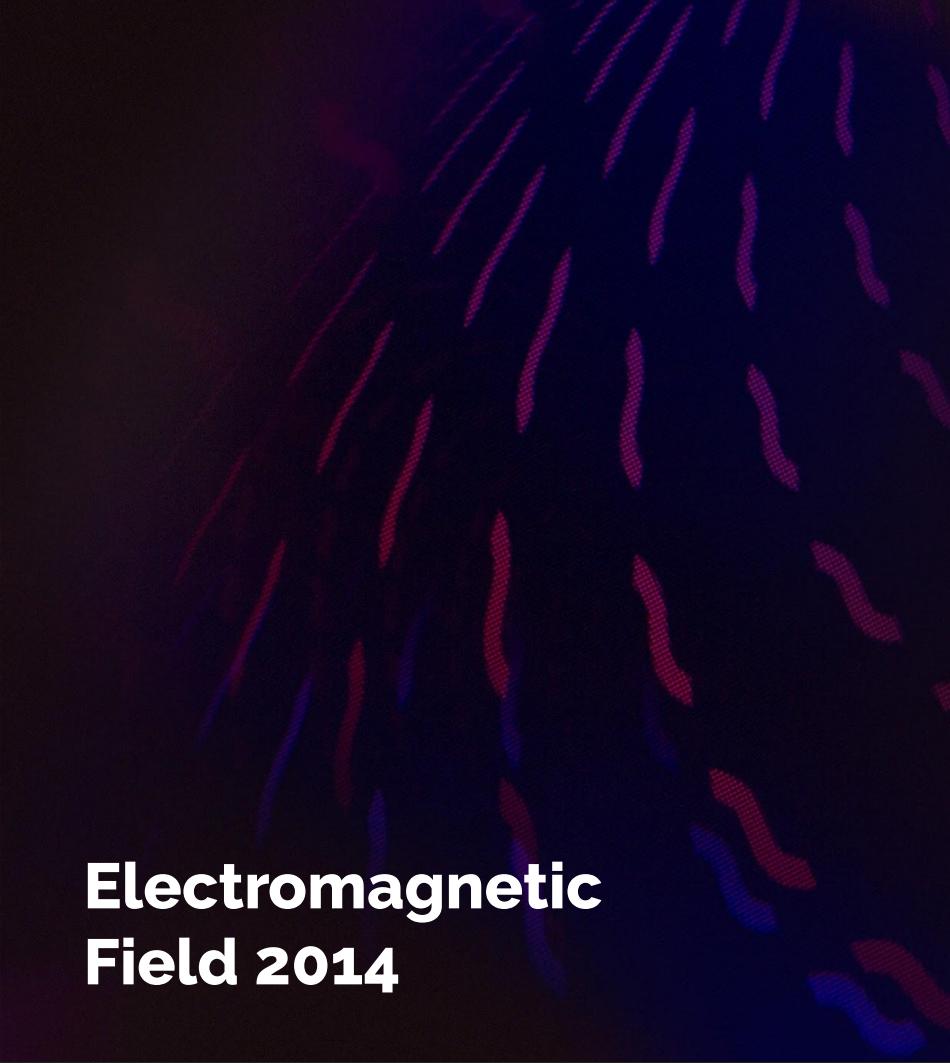


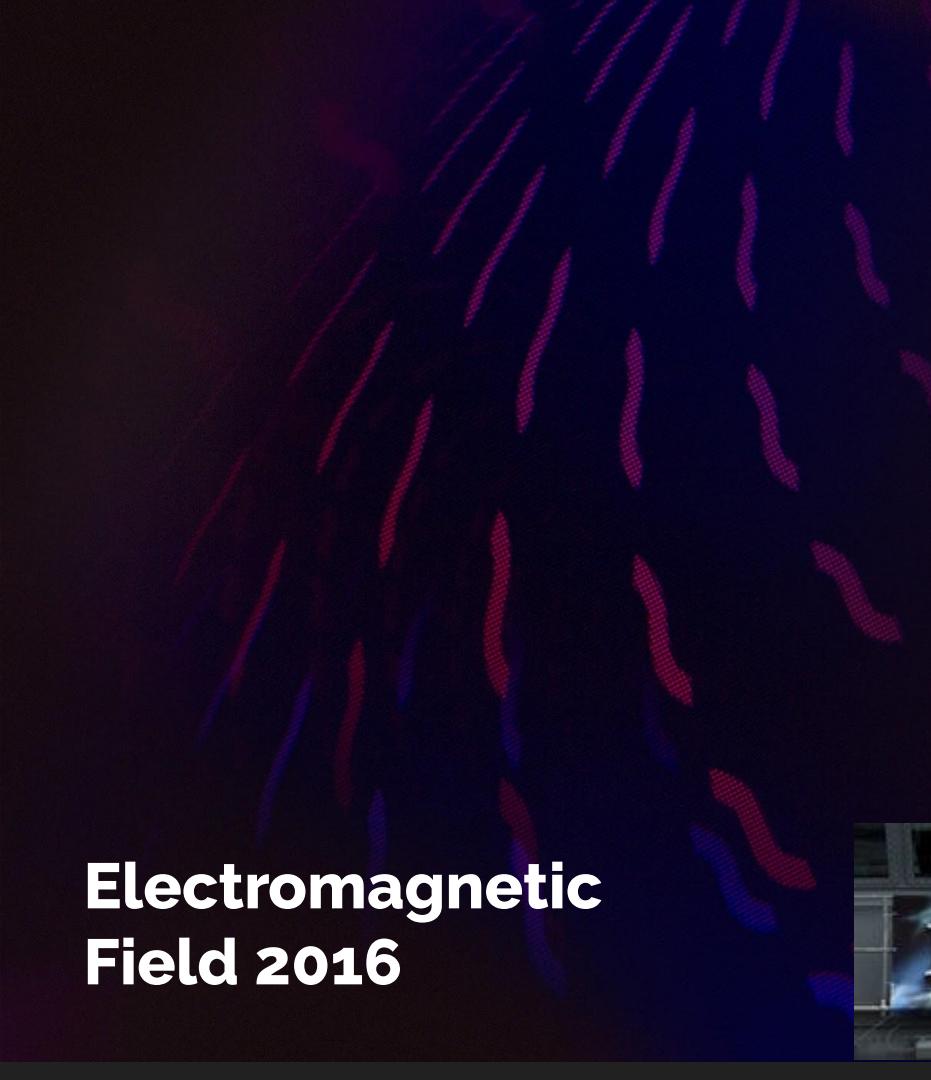


**Electromagnetic
Wave 2013**

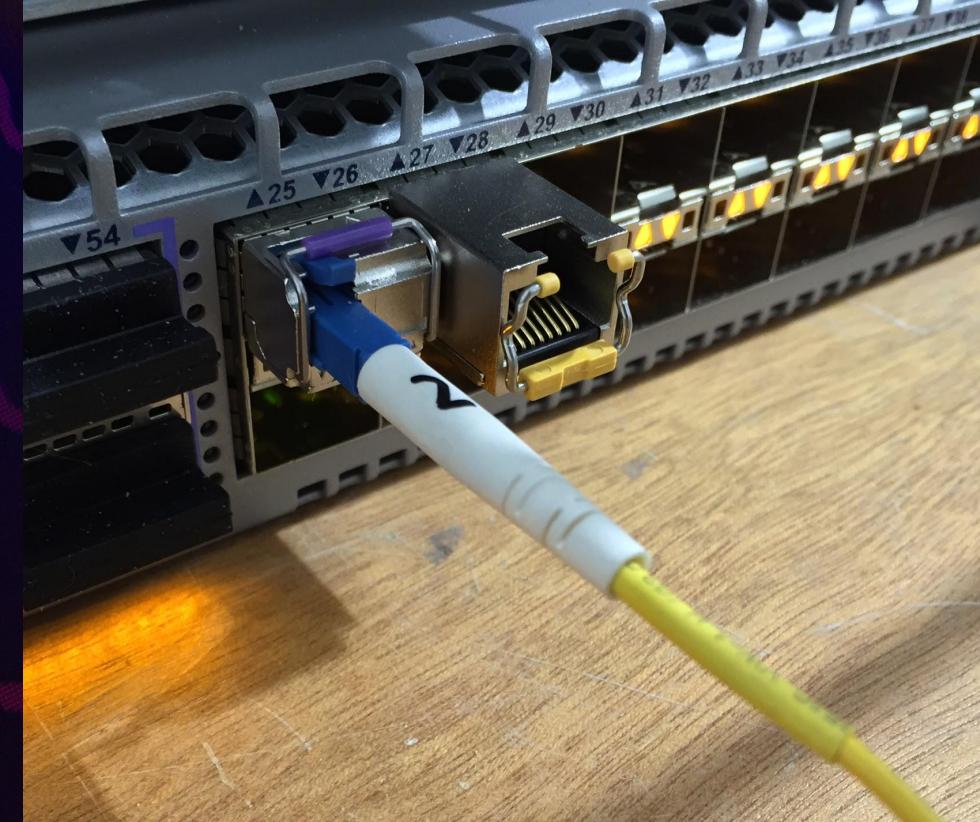


Electromagnetic Field 2014





**Electromagnetic
Field 2016**





Digging in snow



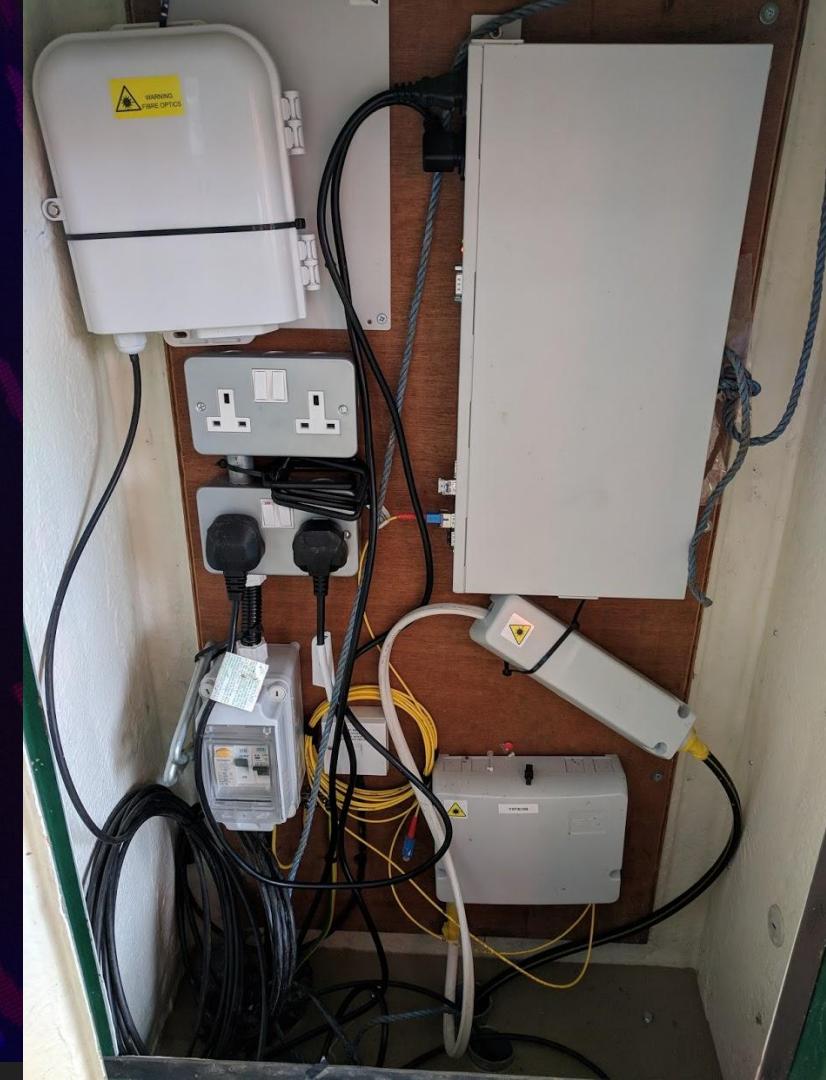


Cabinet base



Off-street furniture

Permanent Installation



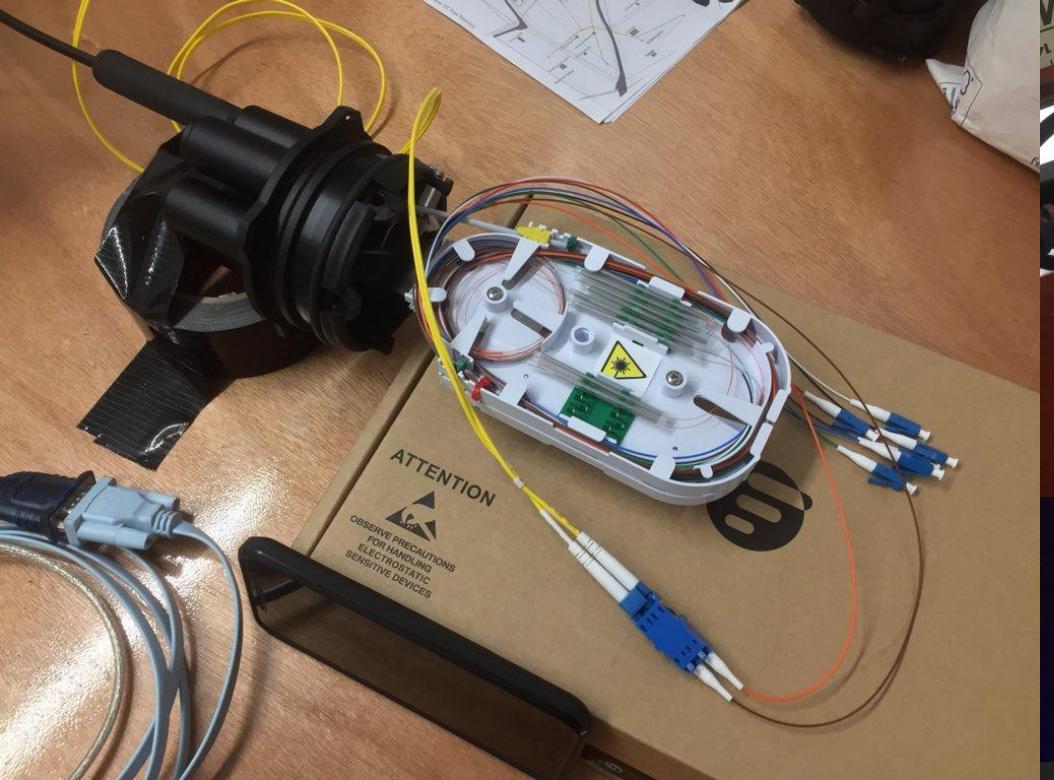


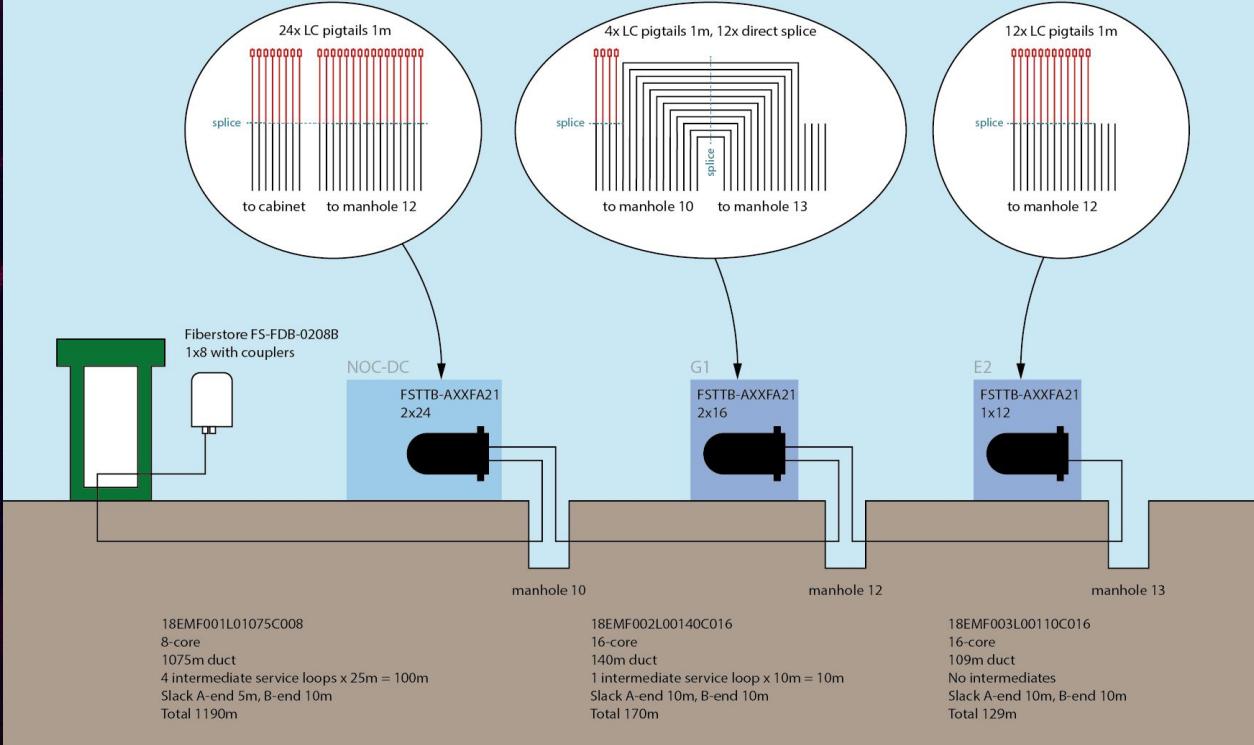






Splicing the uplink





Duct plan



Property of Electromagnetic Field
18EMF003L00110C016

01908 870803 - noelectromfamps.org





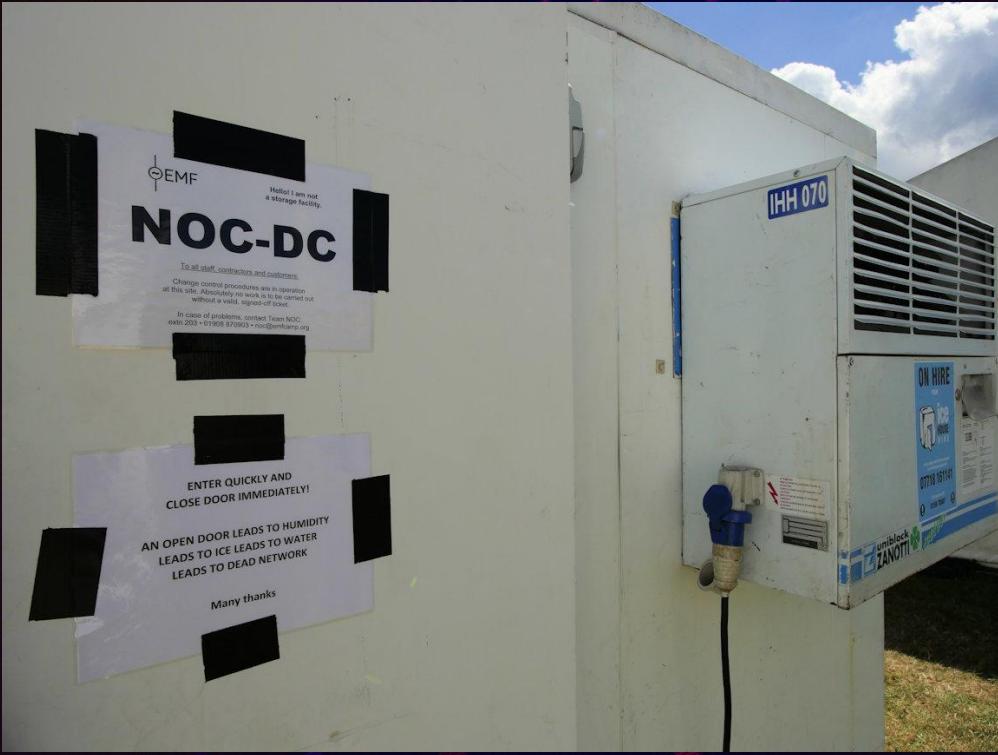
NOC-DC



EMF 2012 Rack in a Tent



EMF 2014 Reefer



EMF 2016 Cool Room + Emergency A/C

EMF 2018





There was no flat





Power resilience



Network Operations Centre of Excellence

Incorporating GCHQ Liaison Office

EMF NOC

dashboard.emf.camp

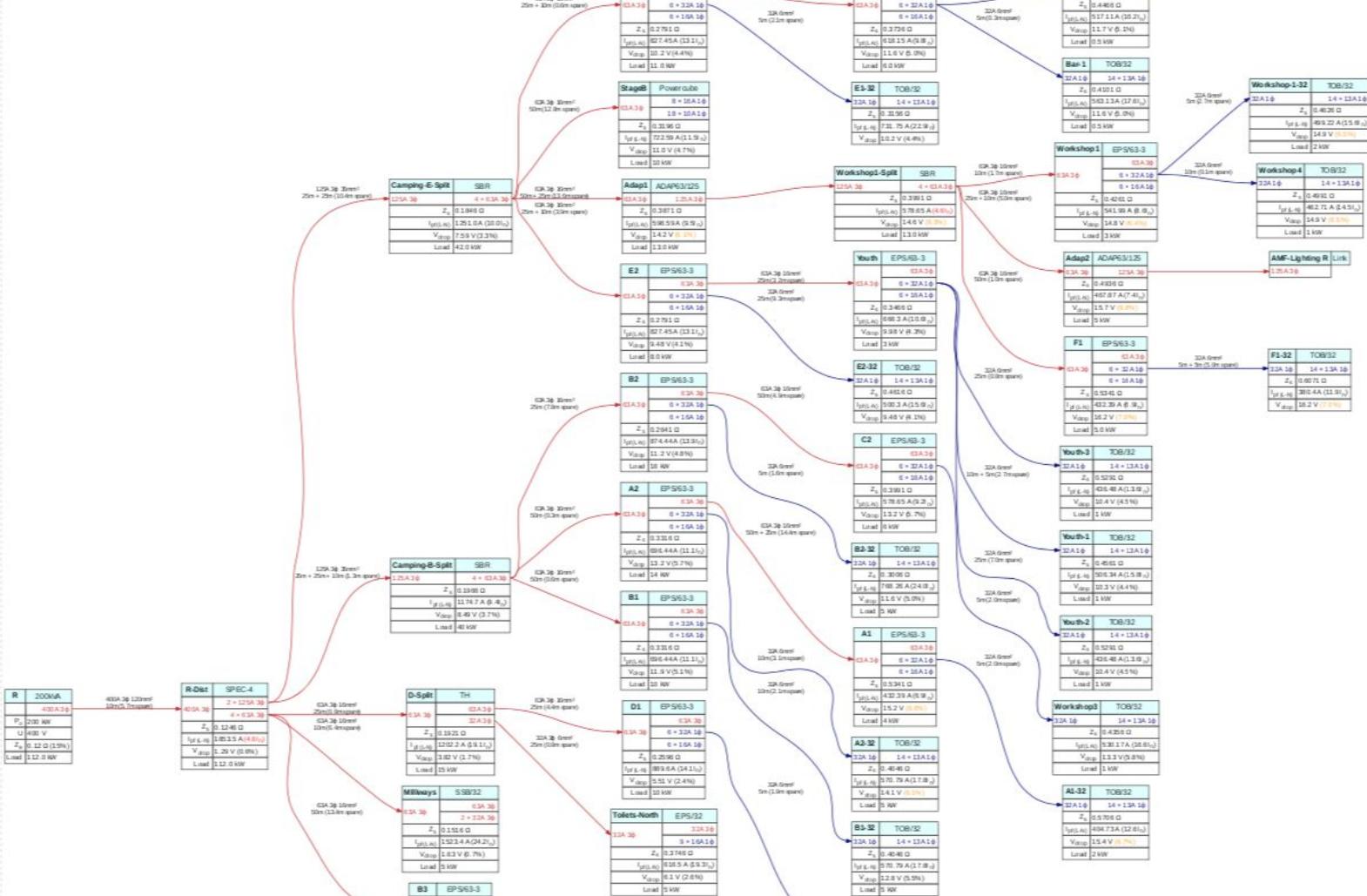
@emfnoc



Site Distribution

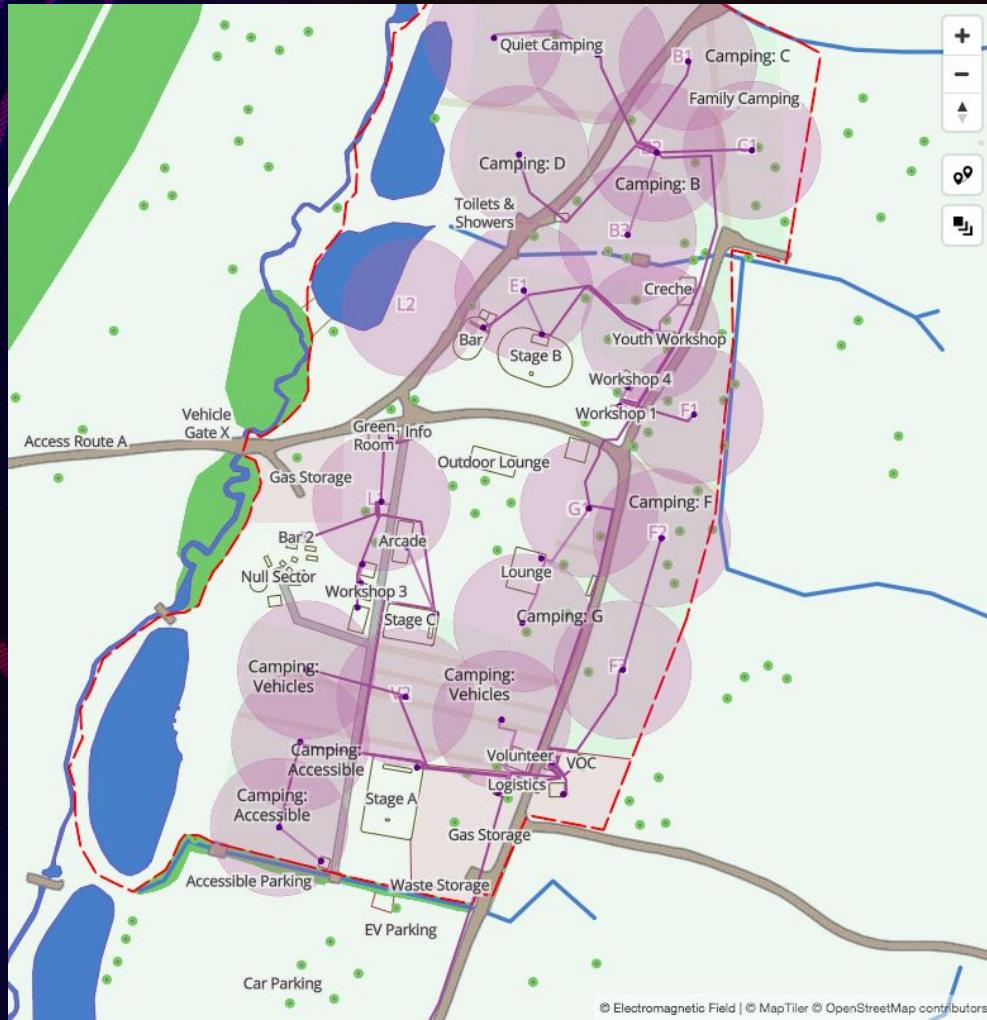


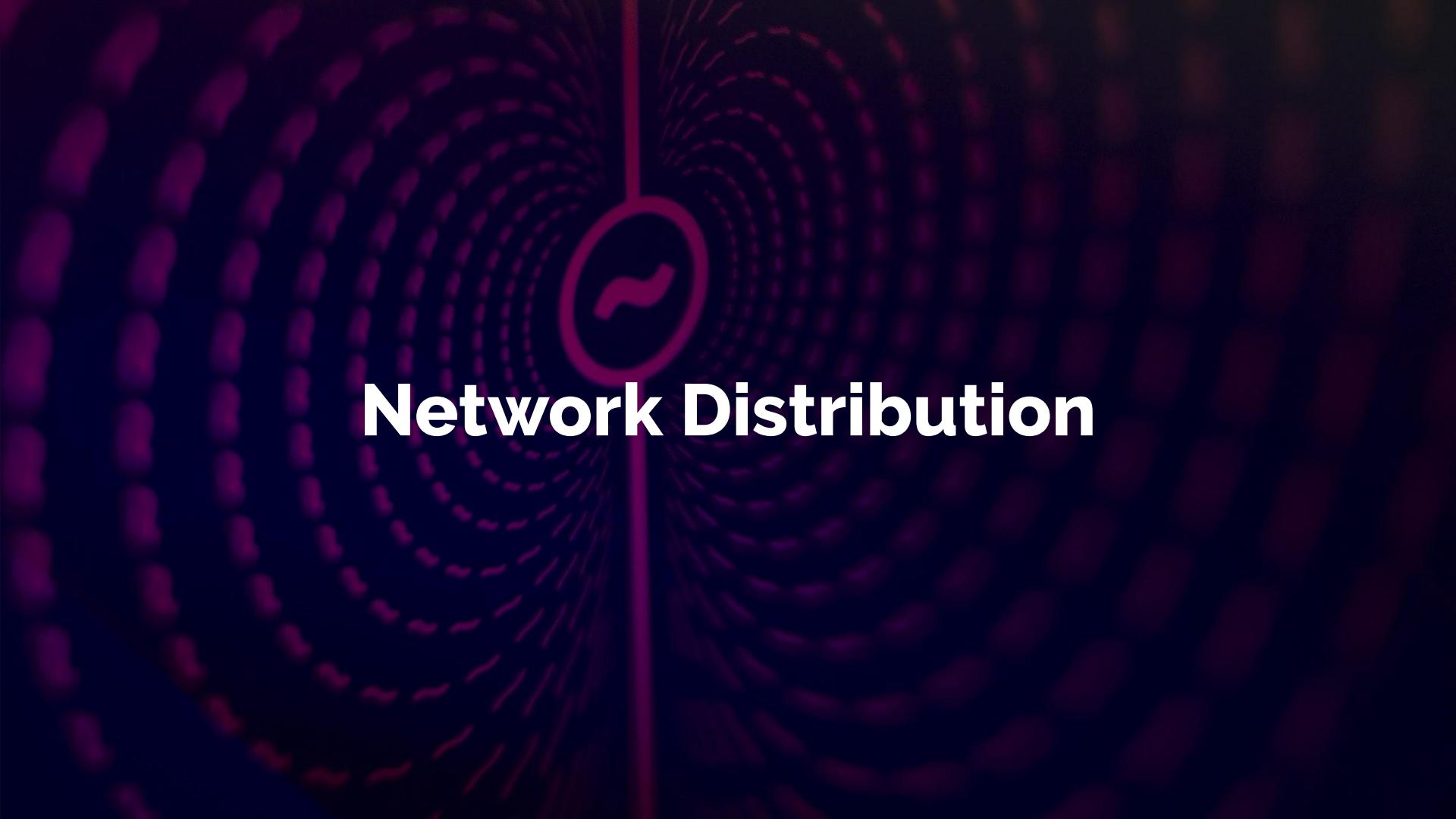




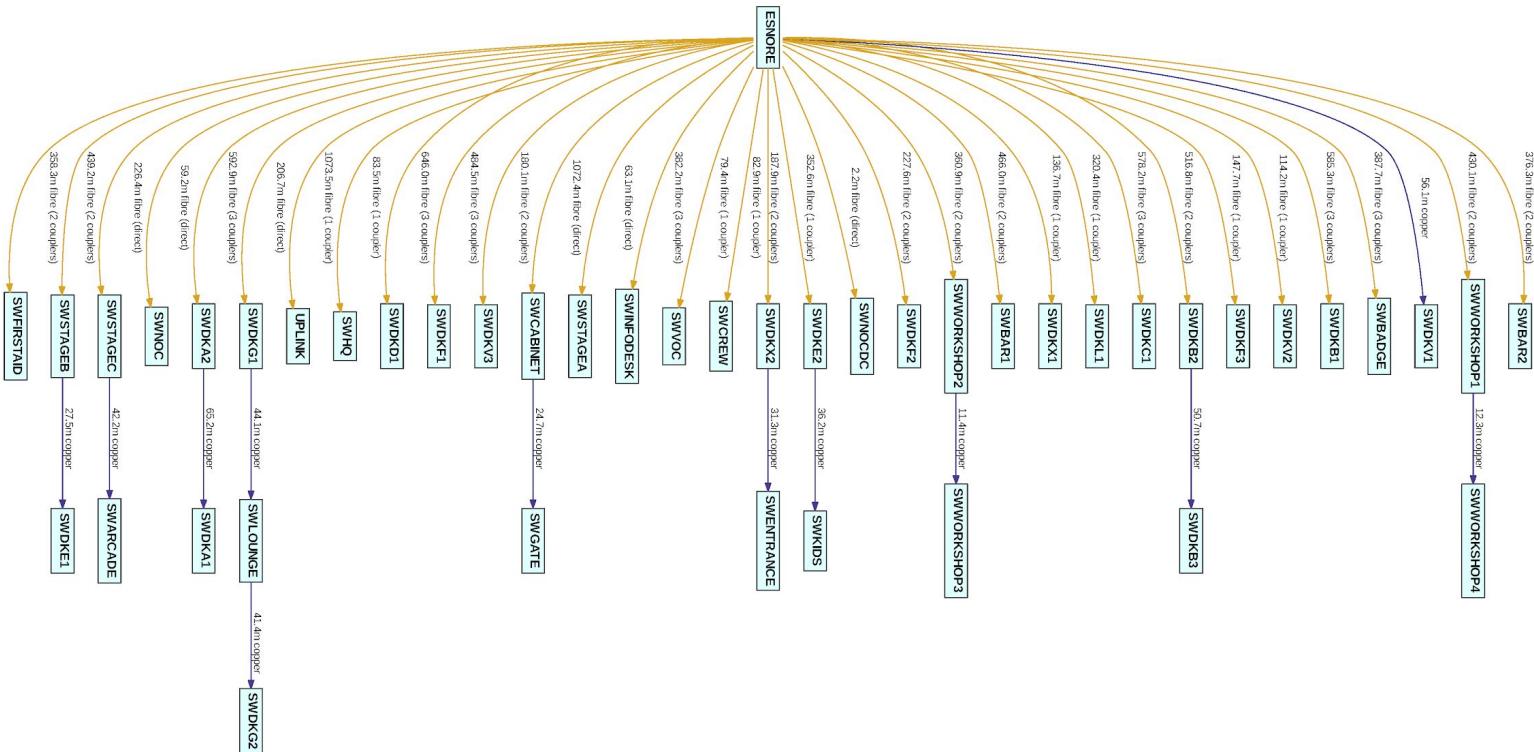
Network

Purple lines: fibres deployed
Purple circles: DK coverage

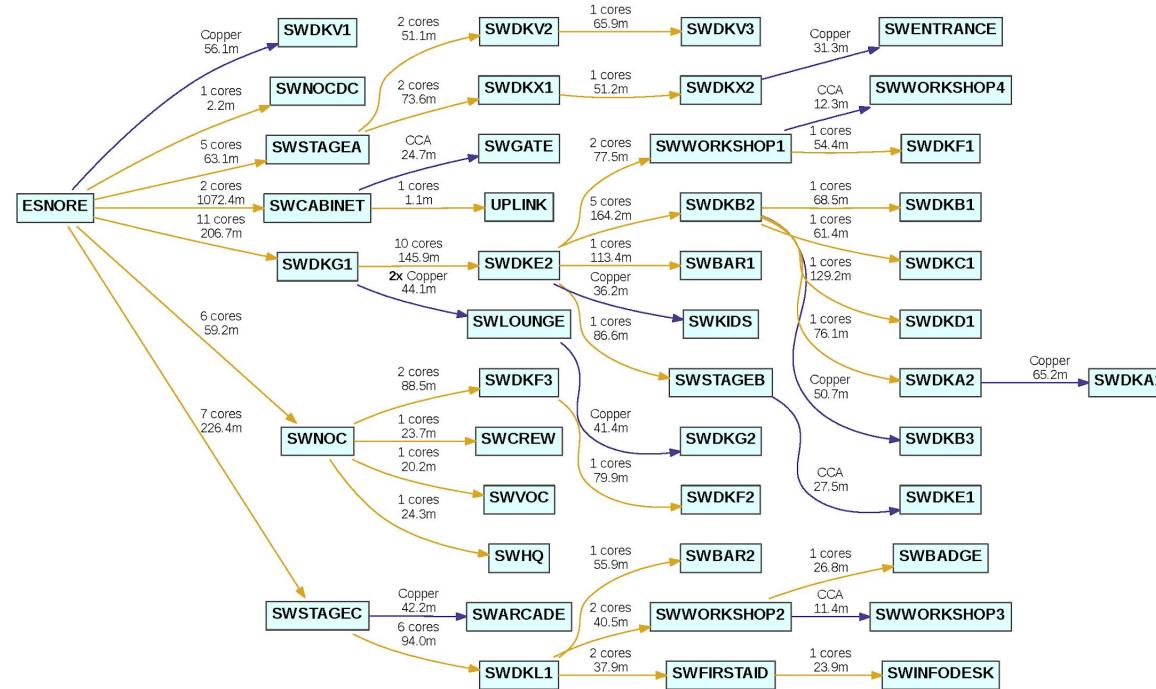




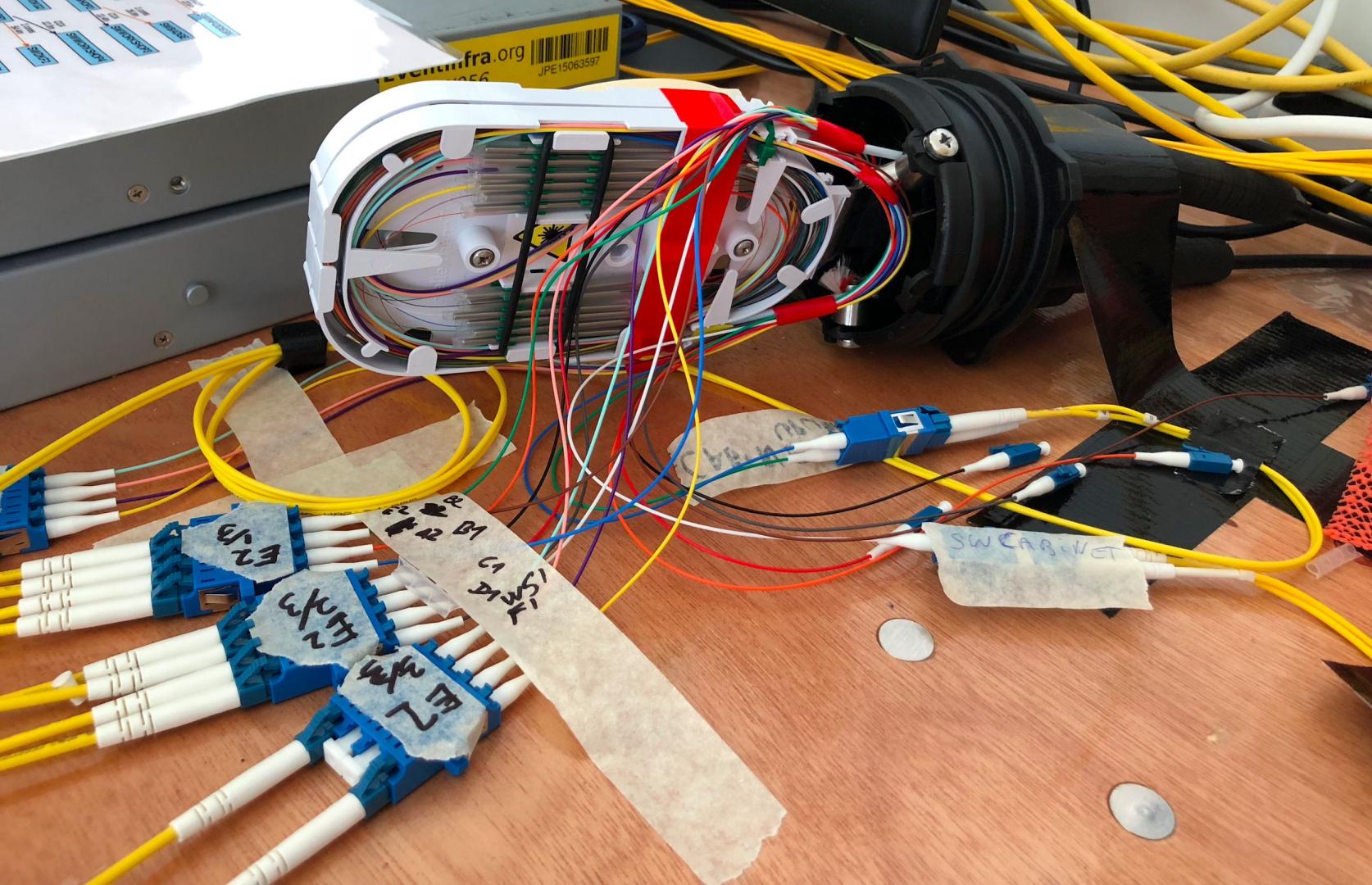
Network Distribution



Logical design (generated from CAD)



Physical design (generated from CAD)



The Basic Unit of Site Internet Distribution: The Datenklo (DK)



Datenklo



Datenklo Inside



Datenklo Pole





Wi-Fi

72 Access Points





Wi-Fi Stats

- 72 Aruba 802.11ac AP's deployed
- Peak 2800 concurrent stations
- 5900 unique devices seen on Wi-Fi
- 94% of devices on Wi-Fi (other 6% on wired)
- 67% of stations on encrypted Wi-Fi
- About 80% of stations on 5GHz



Usernames (inc. eduroam realms):

1. emf: 1775 (30.9%)
2. internetofstuff: 994 (17.3%)
3. anonymous: 335 (5.8%)
4. emfcamp: 127 (2.2%)
5. @soton.ac.uk: 36 (0.6%)
6. outboundonly: 31 (0.5%)
7. @ucl.ac.uk: 22 (0.4%)
8. @york.ac.uk: 18 (0.3%)
9. @nottinghack.org.uk: 17 (0.3%)
10. @noc: 15 (0.3%)

802.11 phy-types:

1. 11ac 5GHz: 2549 (44%)
2. 11n 2.4 GHz: 2517 (43.4%)
3. 11n 5 GHz: 688 (11.9%)
4. 11g 2.4 GHz: 20 (0.3%)
5. 11a 5 GHz: 17 (0.3%)

SSIDs:

1. emfcamp: 2185 (37.7%)
2. emfcamp-insecure18: 1894 (32.7%)
3. emfcamp-legacy18: 1288 (22.2%)
4. eduroam: 385 (6.6%)
5. spacenet: 35 (0.6%)
6. emfcamp-pin: 4 (0.1%)

OS:

1. Linux: 1203 (30.6%)
2. iOS: 917 (23.4%)
3. Android: 878 (22.4%)
4. Mac OS X: 444 (11.3%)
5. Windows: 368 (9.4%)
6. Windows 7: 36 (0.9%)
7. Chrome OS: 32 (0.8%)
8. Windows XP: 26 (0.7%)
9. Windows 8: 13 (0.3%)
10. Windows 98: 2 (0.1%)

“Dark-Dark
Dark-Matter
Matter-Matter”

“Urban Beekeeping”

“Digital Immigrant”

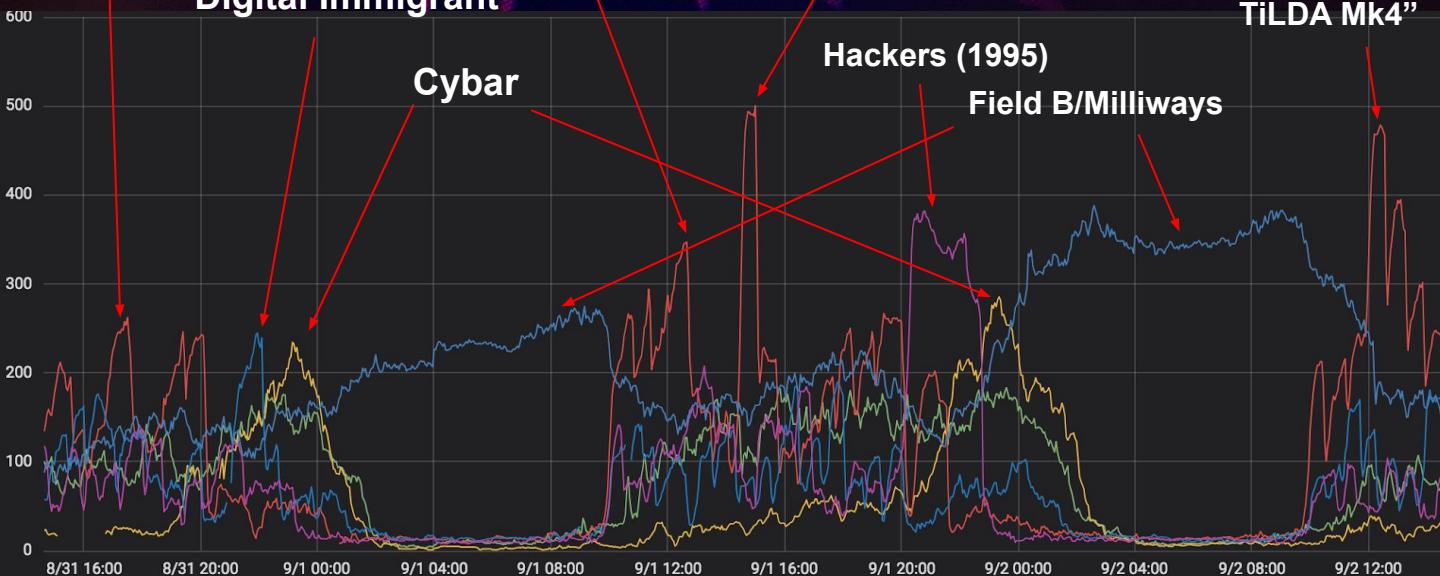
Cybar

“Banned from encrypting”

Hackers (1995)

Field B/Milliways

“The making of
TiLDA Mk4”



WiFi associations per location/area



Statistics

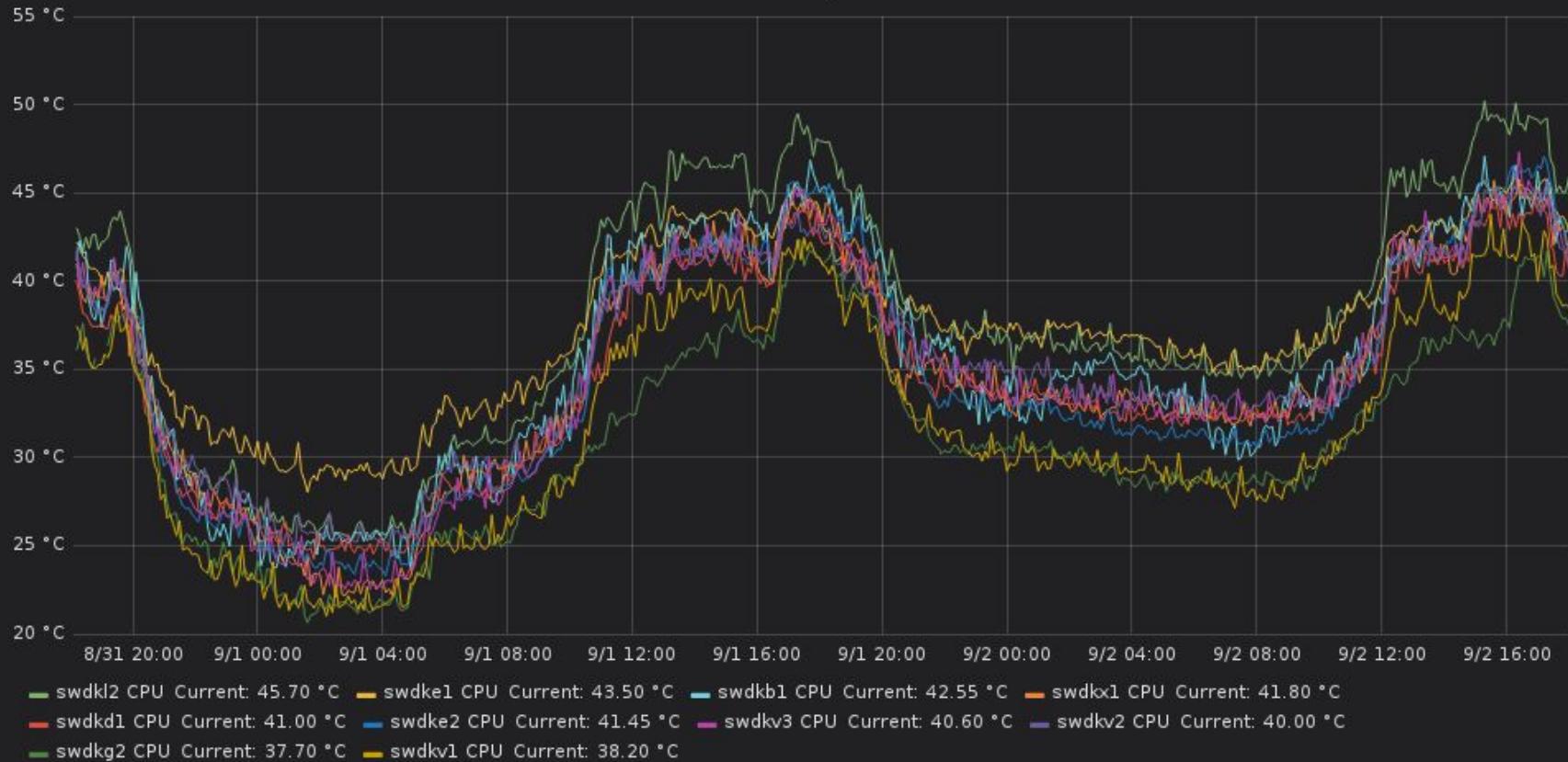
1.0 Gbps

Peak throughput (to field)

Upstream Traffic



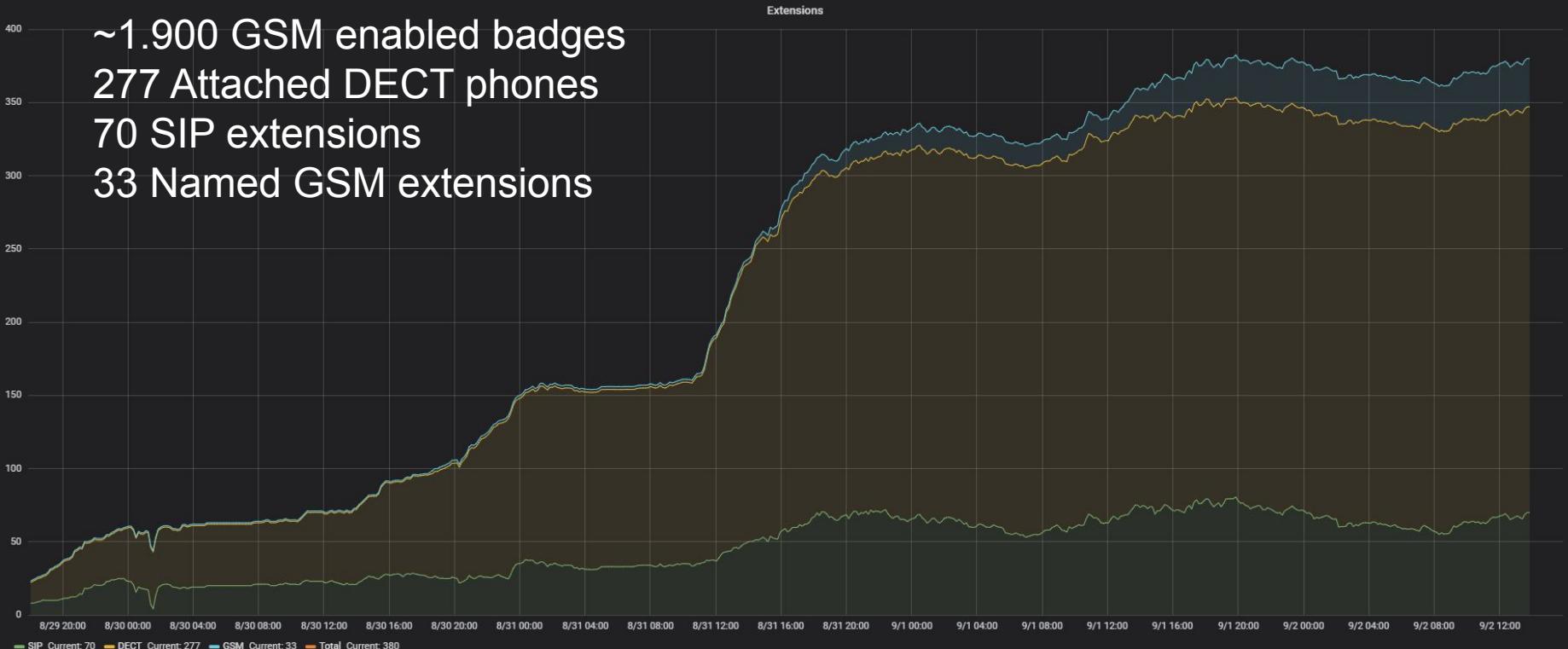
Switch Temperatures





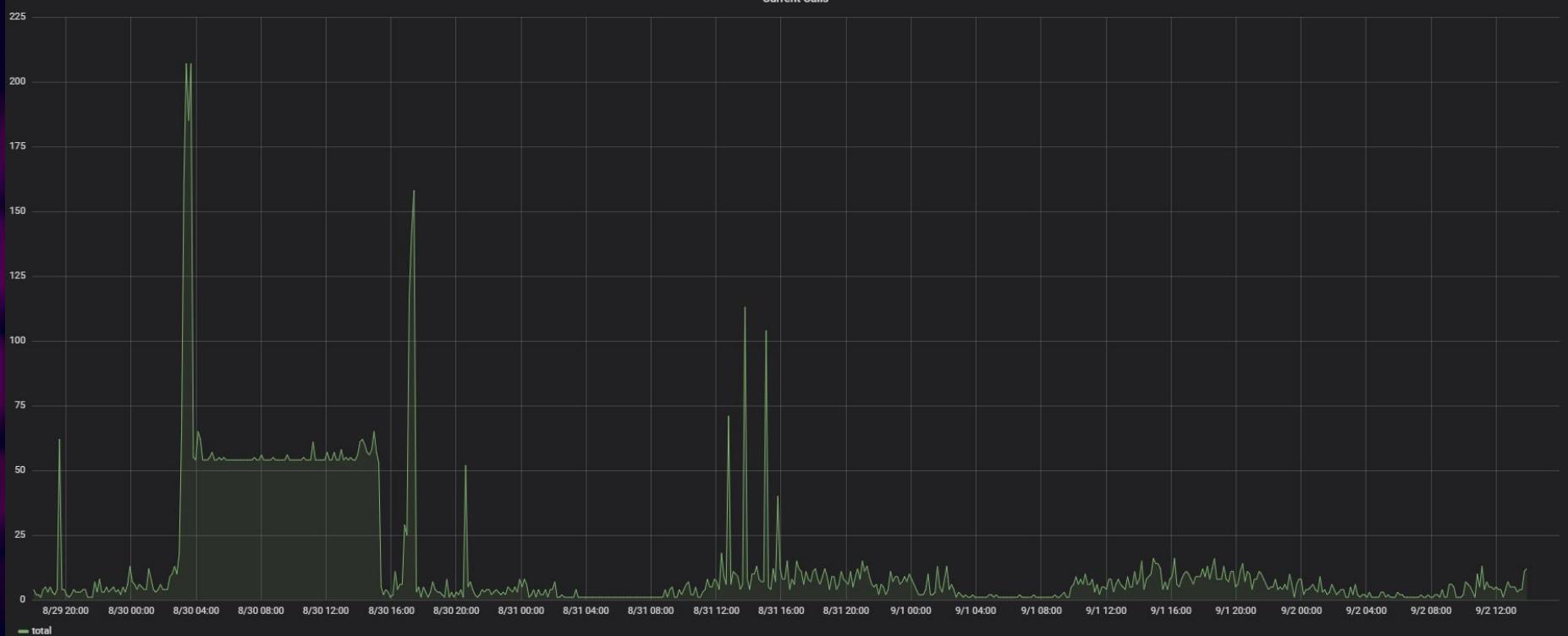
Telephony

~1.900 GSM enabled badges
277 Attached DECT phones
70 SIP extensions
33 Named GSM extensions

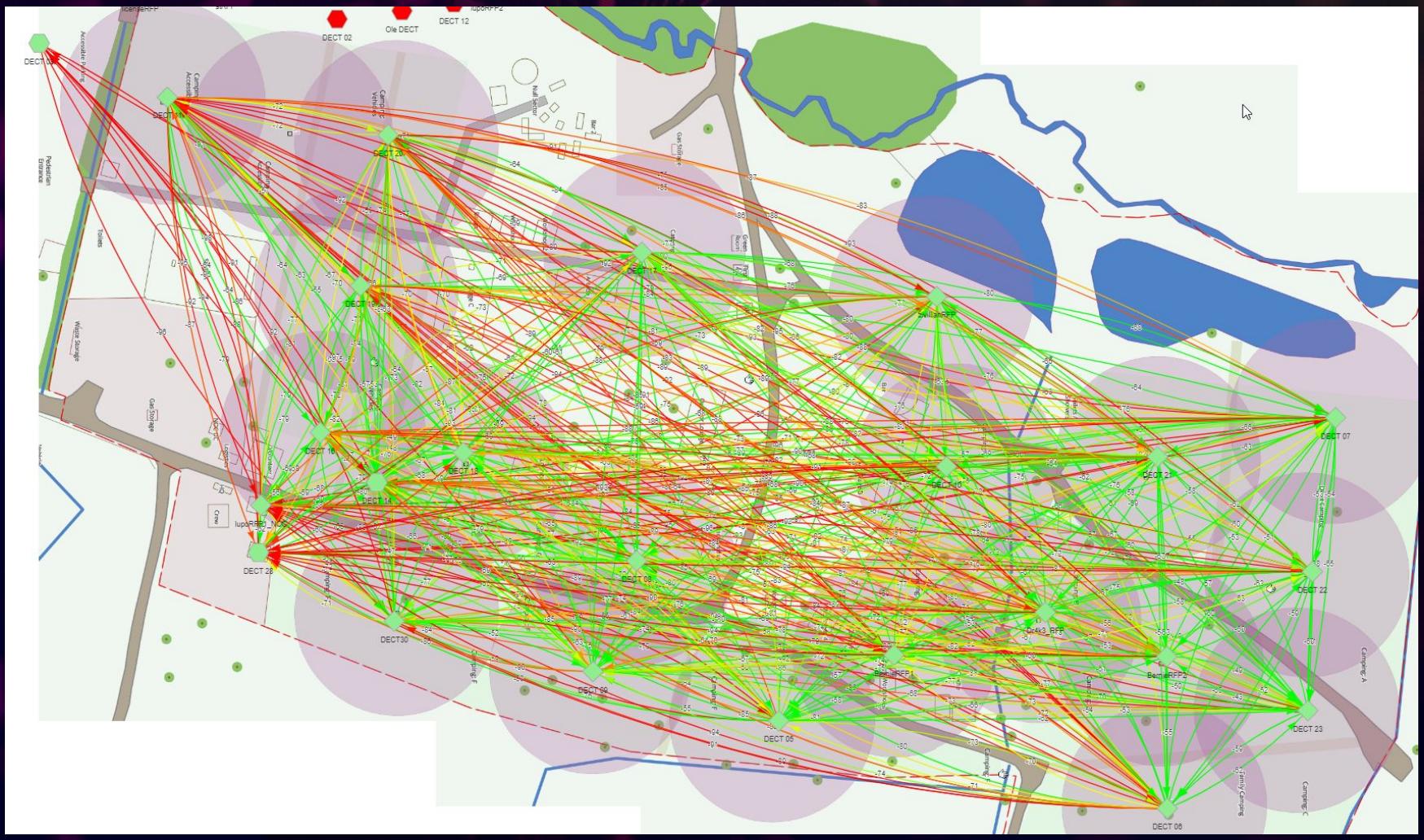


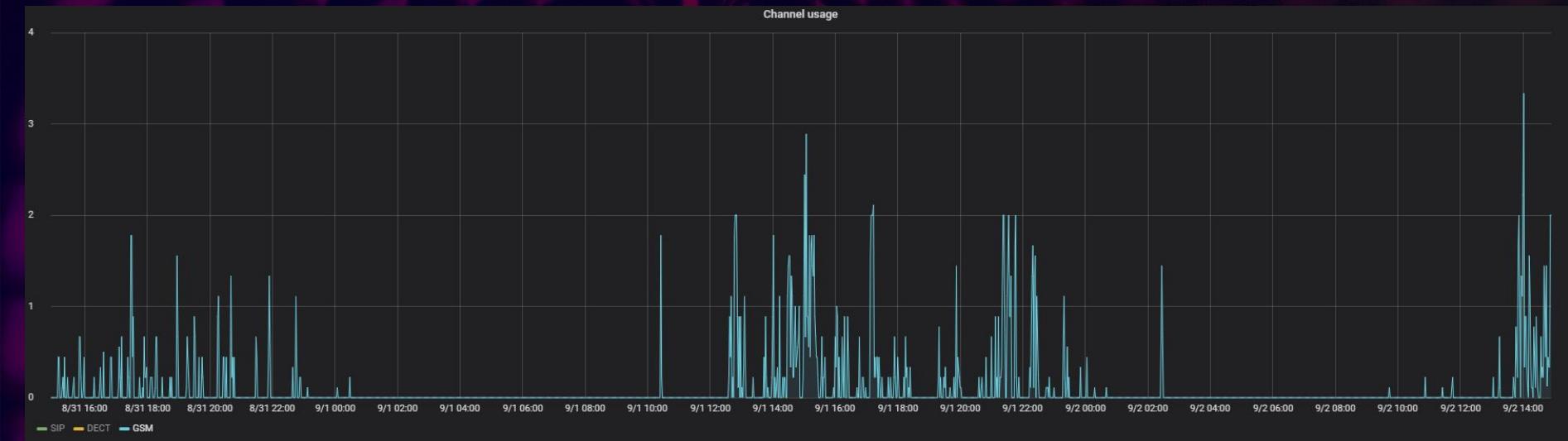
Registered Extensions

Current Calls



Concurrent active calls





Concurrent active GSM calls



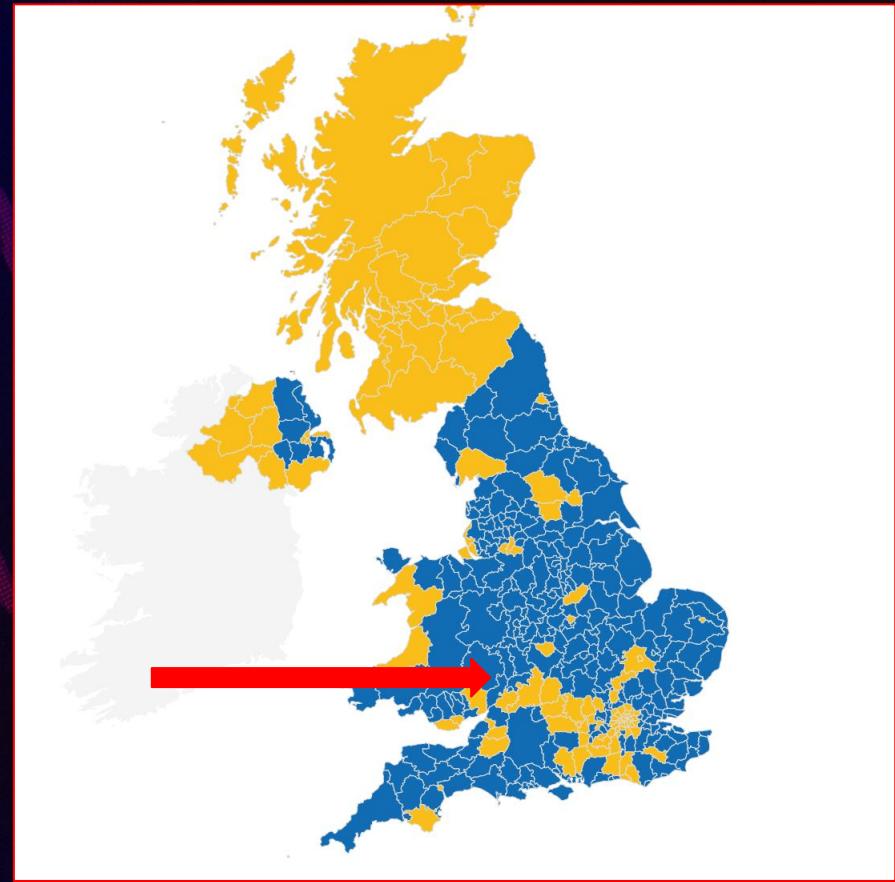
**There are some things
money can't even buy**

£5,500

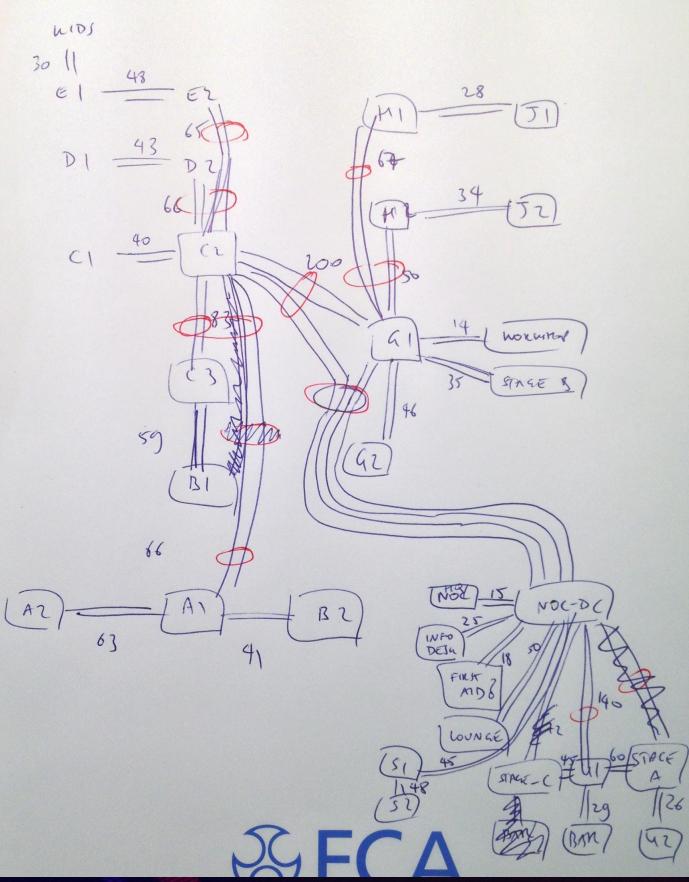
Total Network Expenditure (2018)



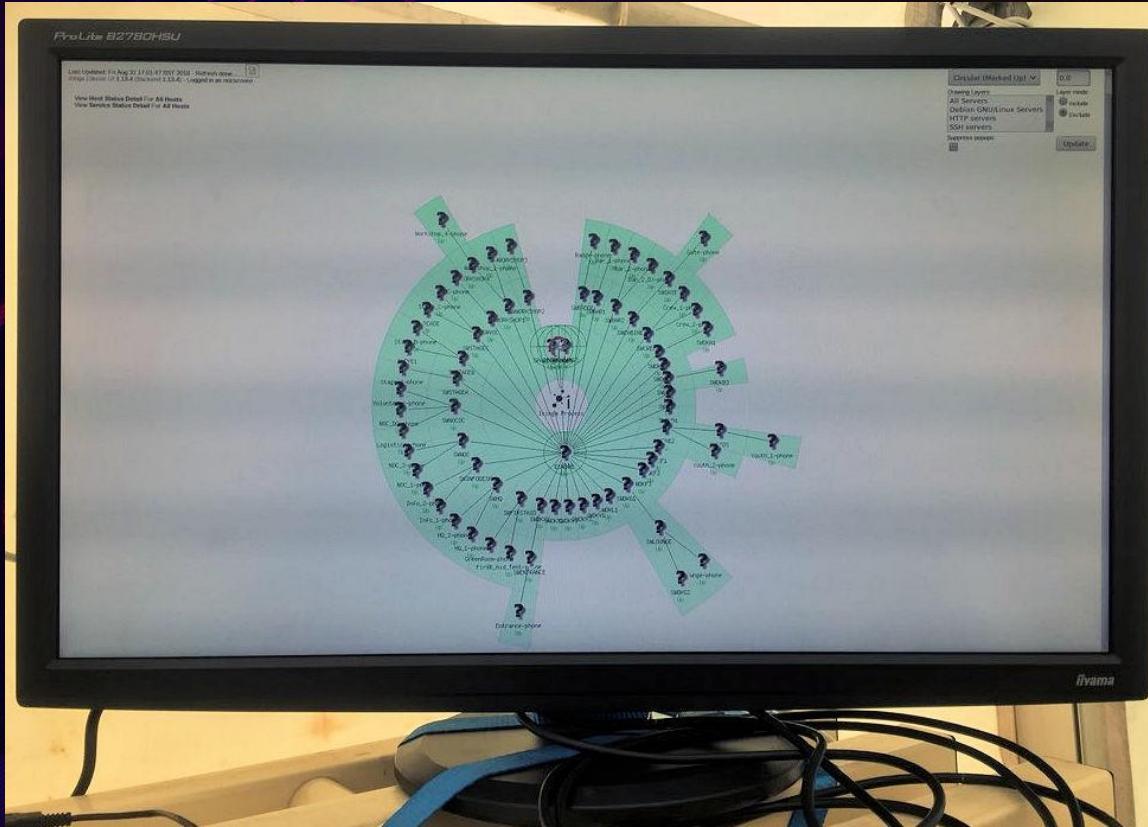
Getting Involved



Do you have network near here?



Can you help planning the network?



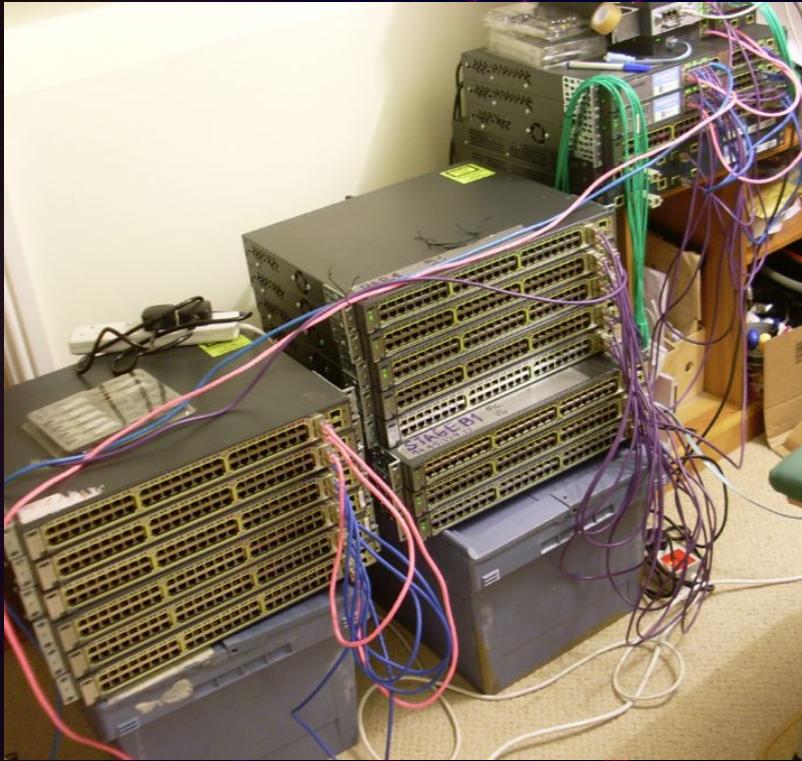
Do you like servers or monitoring?



Can you help building the network?



Can you give us transit?



EMF NOC @emfnoc · Jul 29

If anyone's throwing out old DSLAMs, we may have a use for one or two small ones at EMF 2020 :)

3

13

15



Do you have equipment no longer needed?



noc@emfcamp.org

All our presentations and tools are online:

github.com/emfcamp/emfnoc

www.emfcamp.org
@emfnoc @davidcx
david@emfcamp.org