

# challenges running a large scale public wifi network

DENOG11 - 11.11.2019  
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# Agenda

- who am I
- my employer
- organisational challenges
- operational challenges
- technical challenges
- T-Shirt's?

# who am i

- child of the 80's
- dad of 3 lovely kids
- technical lead of Network at ADDIX AS25415
- Landscape gardener
- Hobby-Excavator-Driver



# My employer

Let's skip that - no time

Looking for a job at the shoreline? Talk to me...



# ADDIX

 **Snellstar**  
Überirdisch. Überall. Überschnell.



# organisational part ahead!

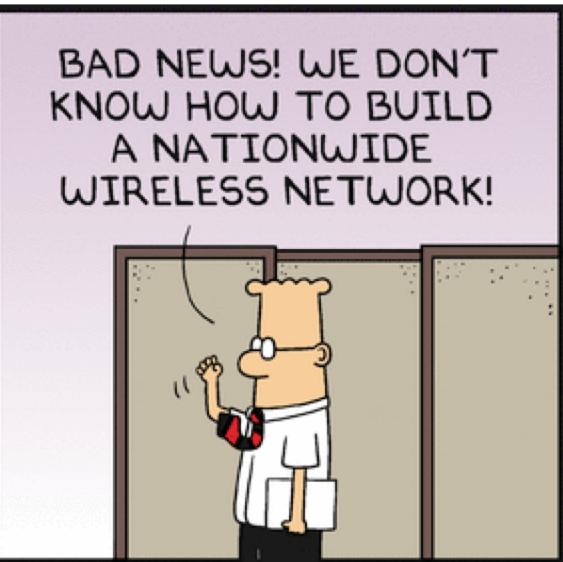
- 4 year ago at DENOG7 I pulled you away from your desk or DC and sent you up a ladder
- Still waiting for some internship-applications



# The day after DENOG7



Dilbert.com DilbertCartoonist@gmail.com

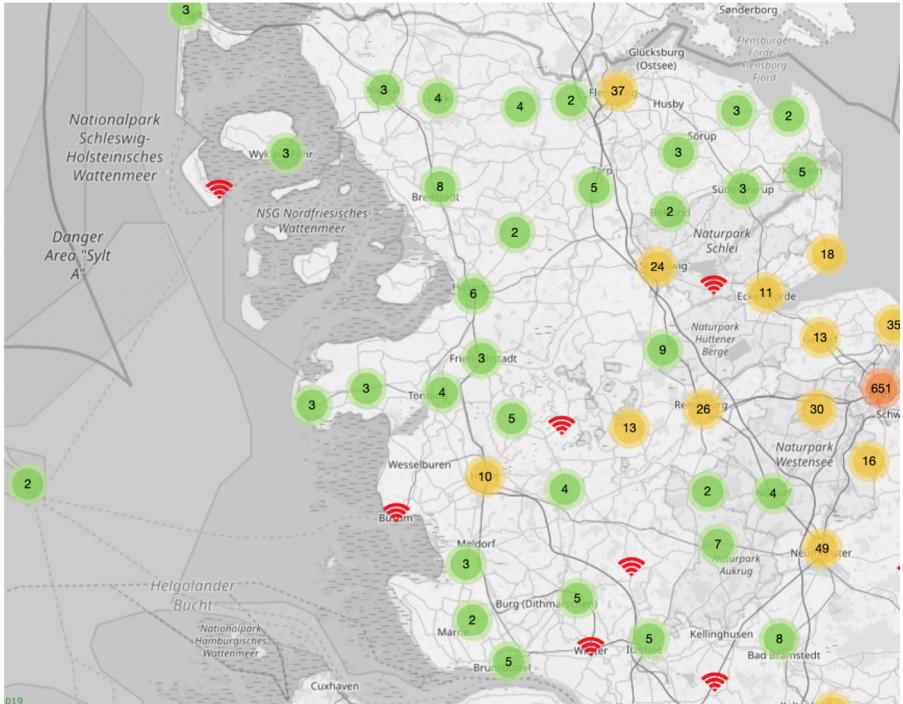


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# Free wifi in Germany?

- Free wifi is more an exception than a rule due to legislative challenges
- Lot of different Hotspots
- Trustworthiness? Do you log into any Hotspot? Do you encrypt your data for transport?
- Let's build a Wifi once connected alway online and be trustworthy



# How to earn Money from free Wifi

- You need “Sponsors” / Customers
- Wifi for Customers is a Service, Money comes from marketing, not from IT-budget
- Many Options killed by tech (landing page closes on android, no javascript in captive-portal and so on)
- Other Options killed by GDPR
- ask Sales and Marketing
- Not a technical Problem - not my Problem



# Zero-trust it and wifi

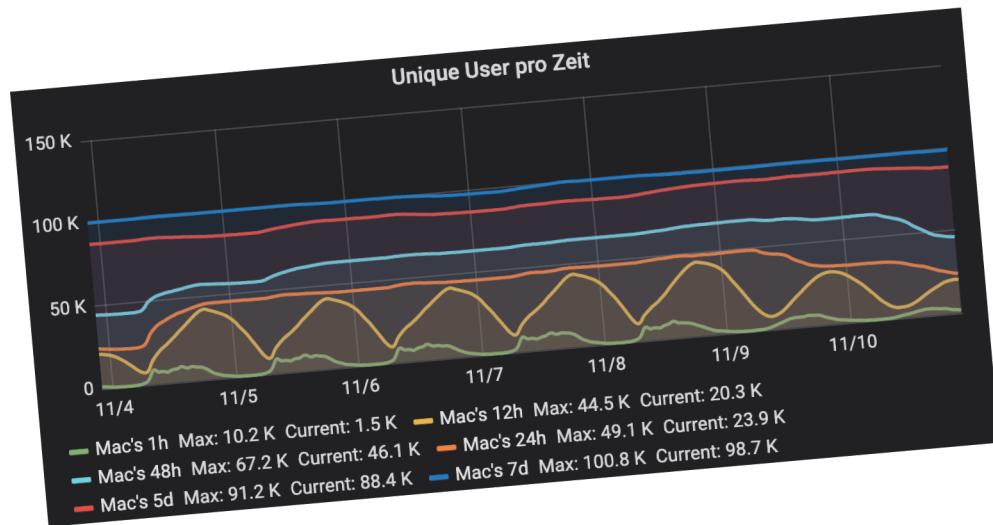
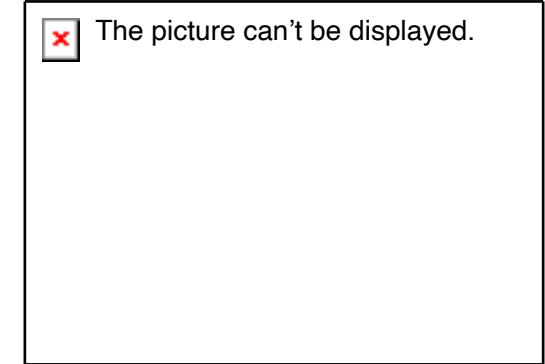
- No trusted networks
- Cloud only-work
- Work on public wifi's, also on company ground
- Good idea, better with WPA3-OWE
- WPA3-OWE encrypt's Wifi-Traffic on Open Networks



# Public Wifi in SH, state of the union

- 2500 AccessPoints
- >750 new Users / Day
- 1.12 mio registered Users
- 100k Unique Users / week
- >1.5mio wifi Sessions / week
- >12.000 concurrent Users
- > 1 gb/s traffic

Want to know more? I'm arround...



# Organisational challenges

- Customers like to interact with wifi
- User
- hard if you display splash page only once per mac
- Take customer expectations down to reality
  - Offer options and be more flexible
    - display splash page more often
    - Interact with customer by apps and
    - Use wifi for better performance of app's and mobile payment



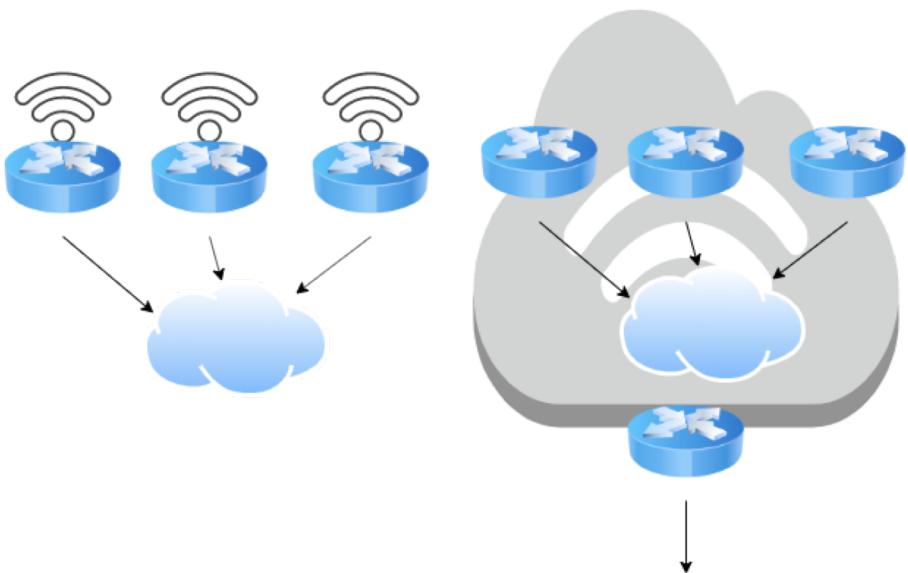
# Technical challenges

- Define your needs
- Find a solutions
  - that fit's your needs (do you know your need's at the beginning?)
  - That is scalable
  - That is programmable (you don't want to manage thousands of AP's by hand)



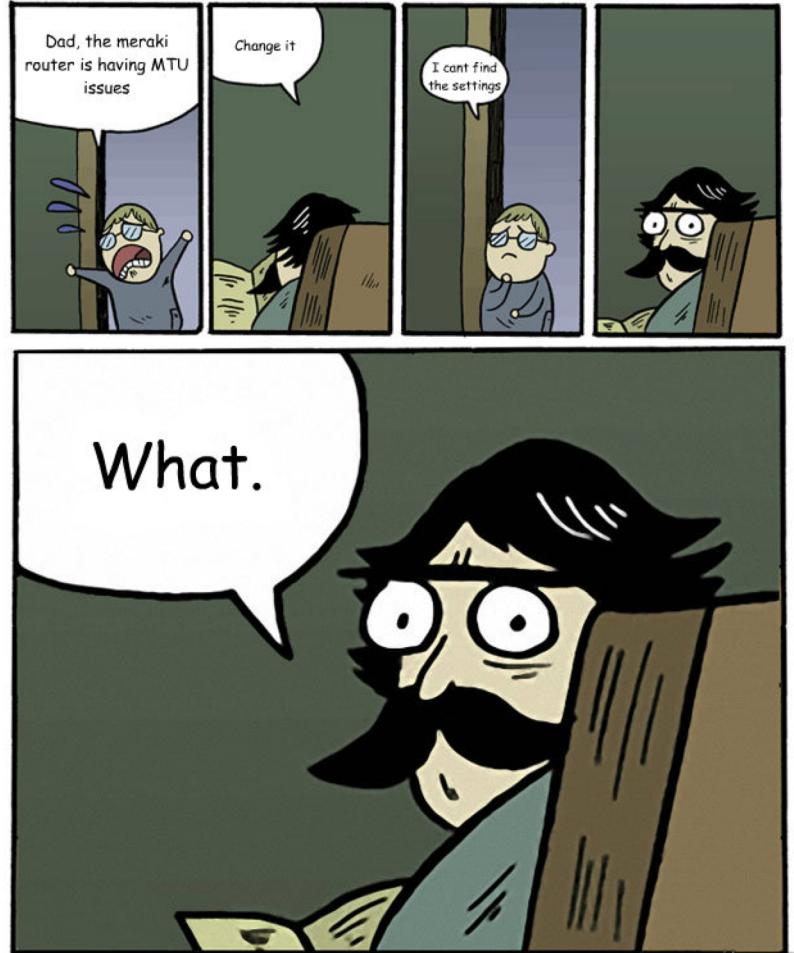
# Local Islands or Overlay?

- do infrastructures overlap?
- Can you automate management of hundreds of local gateways?
- Need to combine multiple access-technologies?
  - User wait's at busstop (AP via mesh Uplink)
  - Roams to Bus (LTE-Uplink)
  - ...



# Overlay Challenges

- Needs big central Gateways
- Traffic is backhauled to your datacenter
- MTU is an \*\*\*\*\*
- Path-MTU-Discovery or MTU (Blockhole) on 10% of Access-Lines broken
- Most Wifi-Vendors support tunneling. But you need to integrate 3rd-pary wifi infrastructures at customer-sites (malls, schools)



# Every wifi need's a cable

- Your wifi can't be better than your internet connection
- Not allowed to run public hotspot on some circuits (read the small letters)
- You can run mesh, know the limits, know the downsides
- You at least need some power (solar, wind, batteries?)



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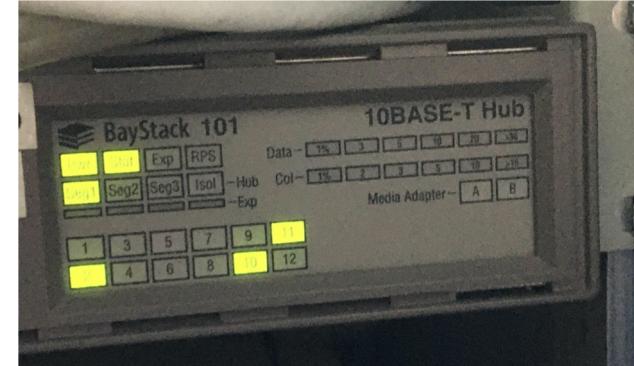


# Mesh

- Use Mesh to extend Coverage, not to extend Capacity. Each Mesh-AP will cut capacity into half.
- Mesh runs on 5Ghz. Path-Selection is Slow, L2-Based and somewhat of a broken spanning-Tree at least with Ruckus, tends to create temporary loops
- Helps to Build redundancy in Uplinks if One Internet Fails AP's will mesh to neighbors.
- Leads to funny things, since it extends an bridges the internal network over wifi to your next customer....

# Where to Place AP's

- high mounting point covers large area
- at high mounting point AP hears a lot of trash
- remember: Every wifi needs a cable
- Infrastructure at mounting-Points not always up to date
- you need owners permission
- mobile-Operators pay well for Antenna-Sites



# Operational challenges

- Management of infrastructure needs to be automated
- Other departments must be able to supply customer with wifi without technical intervention
- Provisioning-Tools: Database -> ZeroTouch-Cloud -> Controller -> Assign to Customer -> Customer enters Monting-Details in Customer-Portal -> AP Shows up on Website

Access Points hinzufügen ≡

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Aktionen ▾

**Access Point ins AP-Registrar eintragen**

**Model**  ✖

**Serial**

**MAC Address**

**Weiter** Cancel

# If something breaks

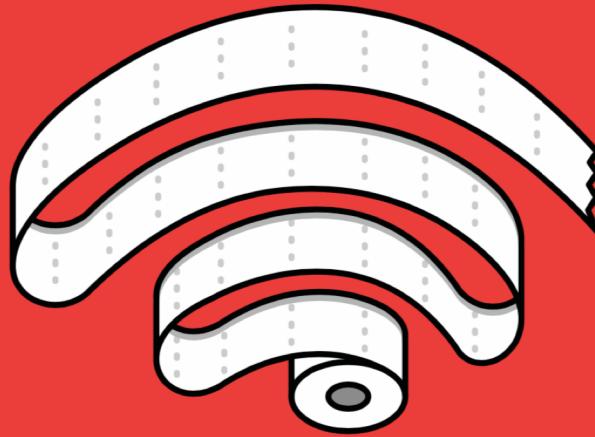
- You offer public wifi. Customers expect home-wifi-performance at public venues
- Limit's (IP-Ports, Bandwith) break customer experience
- Will you notice if something breaks?
  - Monitoring, monitoring, monitoring...
  - Metrics, metrics, metrics...
- Three different Problem-Reports
  - Complainier: because he or she always does
  - “Aluhutträger”: because electro-magnetic-radiation is evil
  - Real Problems



# t-shirt?

- Interested in t-shirts?
- We will make some.
- Looking for text-suggestions
- Talk to me

shity wifi ahead!



wifi is like toilet paper  
shit if it's missing

Did you ever turn it?



# questions?



# contact

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