

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

The logo for Inellstar features a stylized green 'i' symbol composed of three curved lines to the left of the word 'nellstar' in a green, lowercase, sans-serif font. Below the logo is the tagline 'Überirdisch. Überall. Überschnell.' in a smaller, black, sans-serif font.

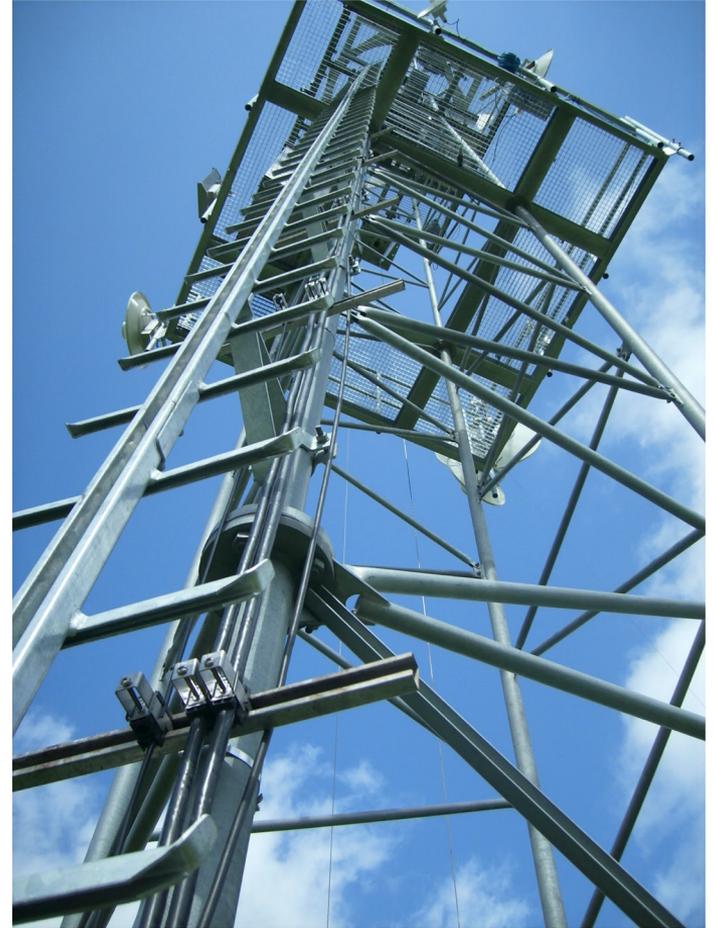
inellstar
Überirdisch. Überall. Überschnell.

The logo for ASTIMAX features a blue swoosh that starts from the left, curves upwards, and ends with a small blue circle. Below the swoosh is the word 'ASTIMAX' in a bold, grey, uppercase, sans-serif font, followed by a registered trademark symbol (®).

ASTIMAX®

organisational part ahead!

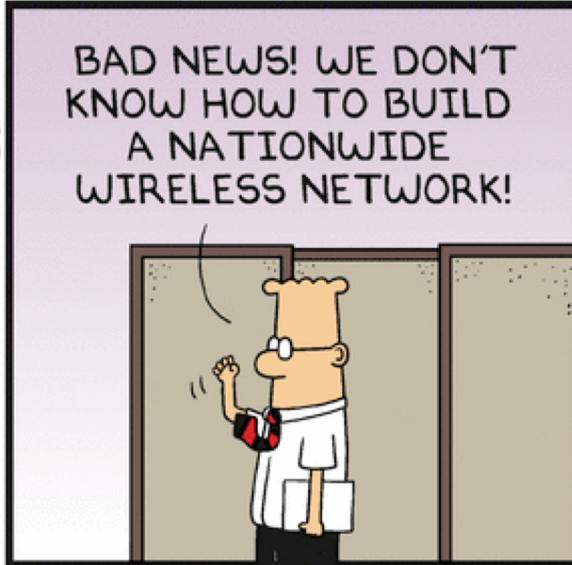
- 4 year ago at DENOG7 I pulled you away from your desk or DC and sent you up a ladder
- Still waiting for some internship-applications



The day after DENOG7



Dilbert.com DilbertCartoonist@gmail.com

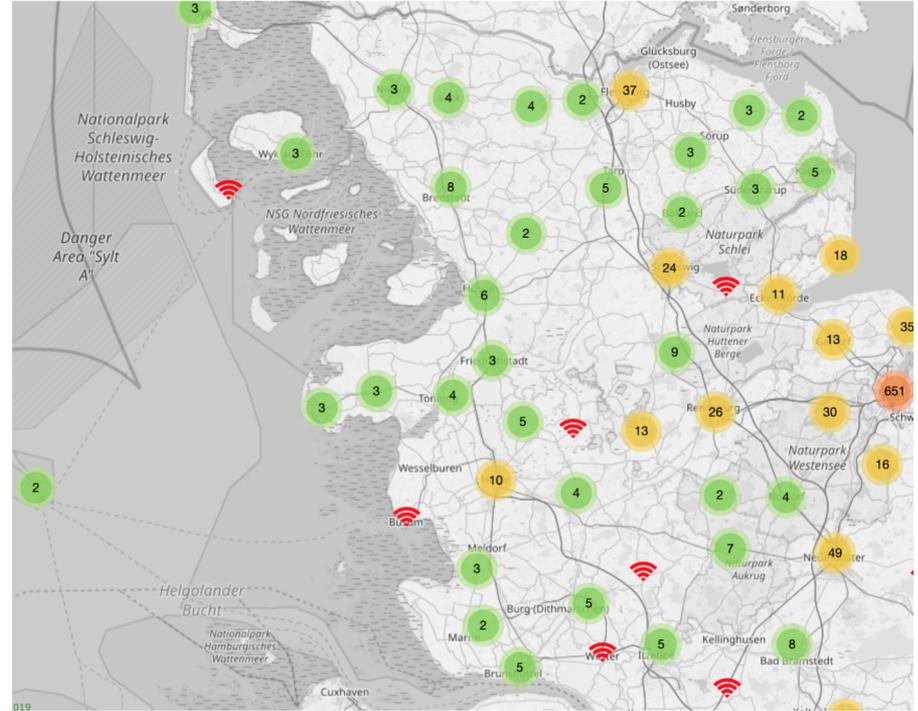


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Free wifi in Germany?

- 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 always 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

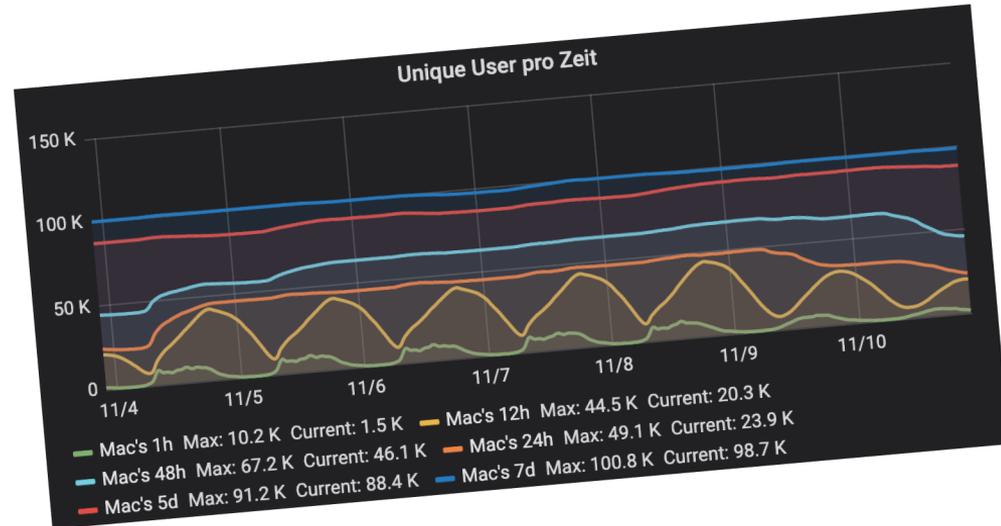
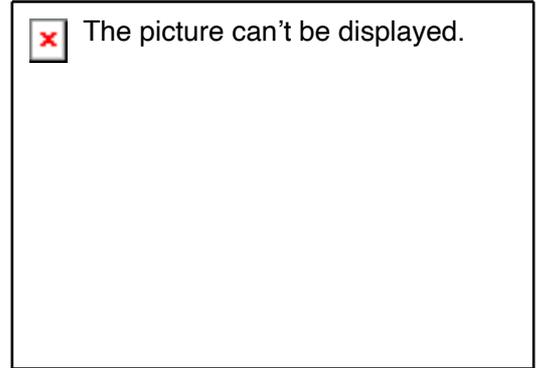
- No trusted networks
- Cloud only-work
- Work on public wifi's, also on company ground
- Good idea, better with WPA3-OWE
- WPA3-OWE encrypt's Wifi-Traffic on Open Networks



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 around...



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



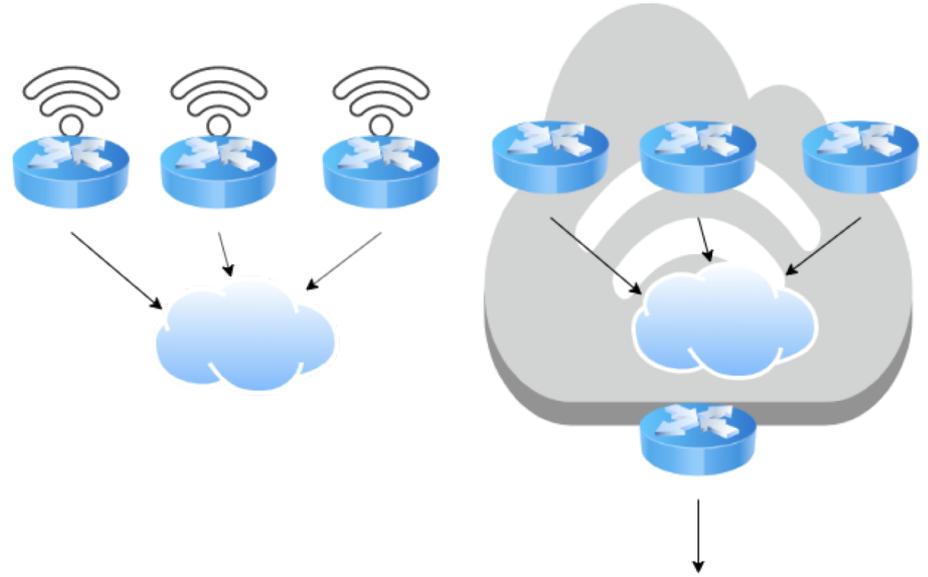
Technical challenges

- 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)



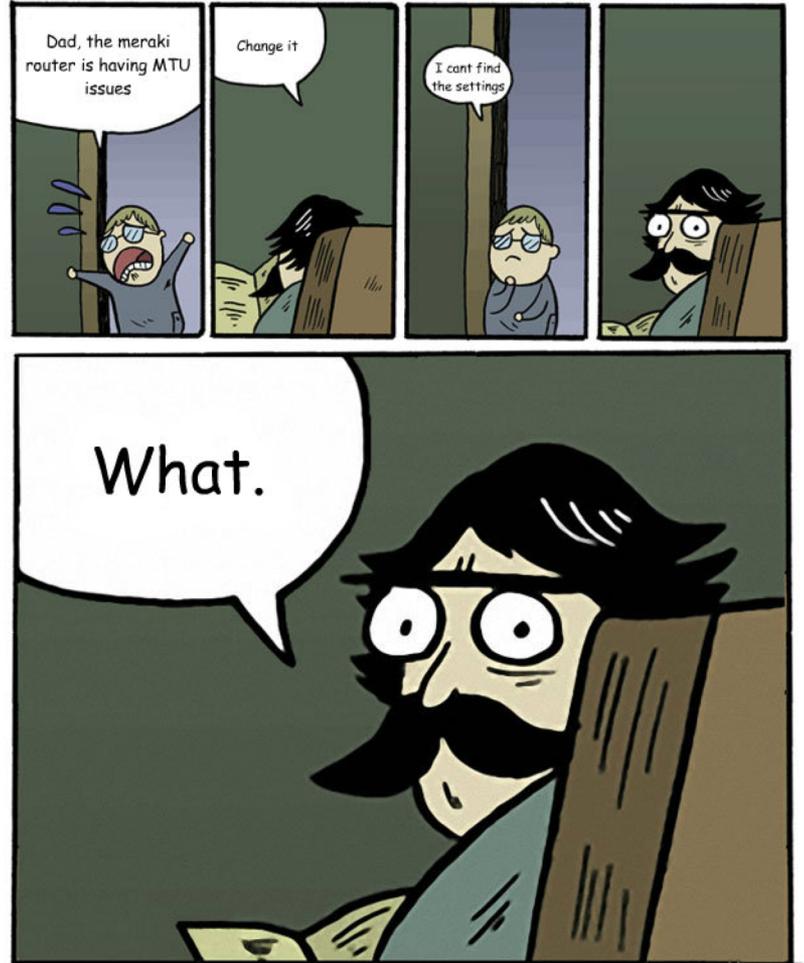
Local Islands or Overlay?

- 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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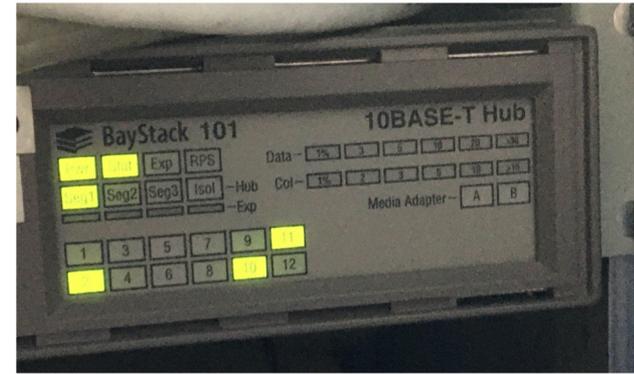


Mesh

- 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 and 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 

Aktionen ▾

Access Point ins AP-Registrrar eintragen

Model

Serial

MAC Address

Weiter

If something breaks

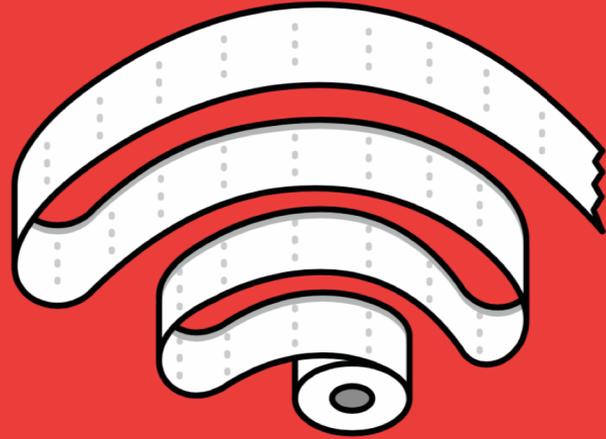
- You offer public wifi. Customers expect home-wifi-performance at public venues
- Limit's (IP-Ports, Bandwith) break customer experience
- Will you notice if something breaks?
 - Monitoring, monitoring, monitoring...
 - Metrics, metrics, metrics...
- Three different Problem-Reports
 - Complainer: because 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!

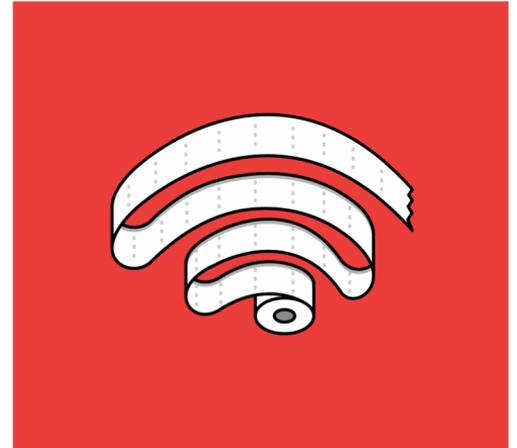


wifi is like toilet paper
shit if it's missing

Did you ever turn it?



questions?



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