The End of Bad Wi-Fi

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About me

• Senior Vice President at Ekahau
• Product strategy & development
• Marketing strategy & evangelism

• Worked with Wi-Fi since 2001
  • At Ekahau since 2002

• More info: Google “Jussi Wi-Fi”
Find me on LinkedIn and Twitter:

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Agenda

• Cars

• Transportation system

• Practical examples
Wi-Fi is everywhere

- Warehouses rely on Wi-Fi
- Hospitals depend on Wi-Fi
- Number #1 thing in hotels: Good Wi-Fi
- No books at schools. Just Wi-Fi
Bad  Wi-Fi is everywhere

- Warehouses grind to a halt when Wi-Fi fails
- Hospitals struggle when Wi-Fi fails
- Guests go somewhere else when Wi-Fi fails
- Student satisfaction goes down when Wi-Fi fails
Why does bad Wi-Fi exist?
Wi-Fi Network Life Cycle
The Promise

DEPLOY

EXPAND / REBUILD

OPERATIONS
MONITOR / TROUBLESHOOT
Reality

DEPLOY

EXPAND / REBUILD

TROUBLESHOOT

COVERAGE HOLES  ROAMING ISSUES
ERRORS  INEFFECTIVE AIRTIME USAGE
PACKET LOSS  CHANNEL OVERLAP
INTERFERENCE  CONFIGURATION ERRORS
Life cycle for Wi-Fi that works

Plan
Validate
Deploy
Troubleshoot
Expand/Rebuild
Bad Wi-Fi

• Problems connecting
• Choppy video
• Dropped calls
• Lost revenue
• Impacted healthcare services

Great Wi-Fi

• Things just work

Our mission
Client devices
Access points
Wi-Fi channels
Automatic RF functionality in access points is like Tesla’s Auto-Pilot

- Transmit power optimization
- Channel optimizations
- Dynamic allocation of dual-5GHz
So, site surveys are not necessary.
Thank you!

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Client devices
Access points
Wi-Fi channels
Let’s take a closer look.
Each lane has limited capacity

- 3 channels on 2.4 GHz (1,6,11)
- 20+ on 5GHz (36-165)

- Use all the channels you can!
Two cars per lane is not better than one

- At any location...
- ... on any channel...
- ... only use one access point!

- Multiple access points on the same channel cause **co-channel interference**
The imbalance between the two highways

- 2.4 GHz frequency is often overutilized
  - Yet it only has 3 channels!

- Clients still tend to associate to 2.4 GHz radios
  - Received signal strength at the client device often higher on 2.4
  - Situation is improving
Oh, sheep!

- Wi-Fi devices play nice: they wait for their turn
  - 802.11 protocol
- Other devices don’t understand 802.11, and do whatever they like
  - Microwave ovens
  - Cordless phones
  - Bluetooth
  - Video cameras
  - Baby monitors
Slow vehicles hurt everyone on the road

- Legacy client devices (802.11g, 802.11b) slow down everyone in your network
Minimum speed limits

- If you support the slowest data rates in your Wi-Fi network
  - Tons of overhead
  - Clients sticking to far away access points
  - Slower overall performance
Consider capacity

• Wi-Fi design is still often seen equal to coverage design

• Coverage is easy

• Your primary design goals in this decade should be
  • Minimal CCI
  • Capacity
The biggest mistake: Not planning at all

- Talk to stakeholders
  - Especially network users
- Account for main requirements
- Design carefully
- Take advantage of simulation
- Reserve time & $ for on-site work
Auto-Pilot

• The Auto-Pilot is a great help
  • So is auto-RF in access points

• Best assistance is collision avoidance
  • Just like self healing is in the APs

• However
  • if the road has been badly designed...
  • ... or road conditions are bad...
  • ... auto-RF cannot solve the problem alone
Be this guy...  ... not this guy
Your Wi-Fi network

- Like these gentlemen - does it stand out?

- In good or bad?
Practical examples
Thank you!

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