



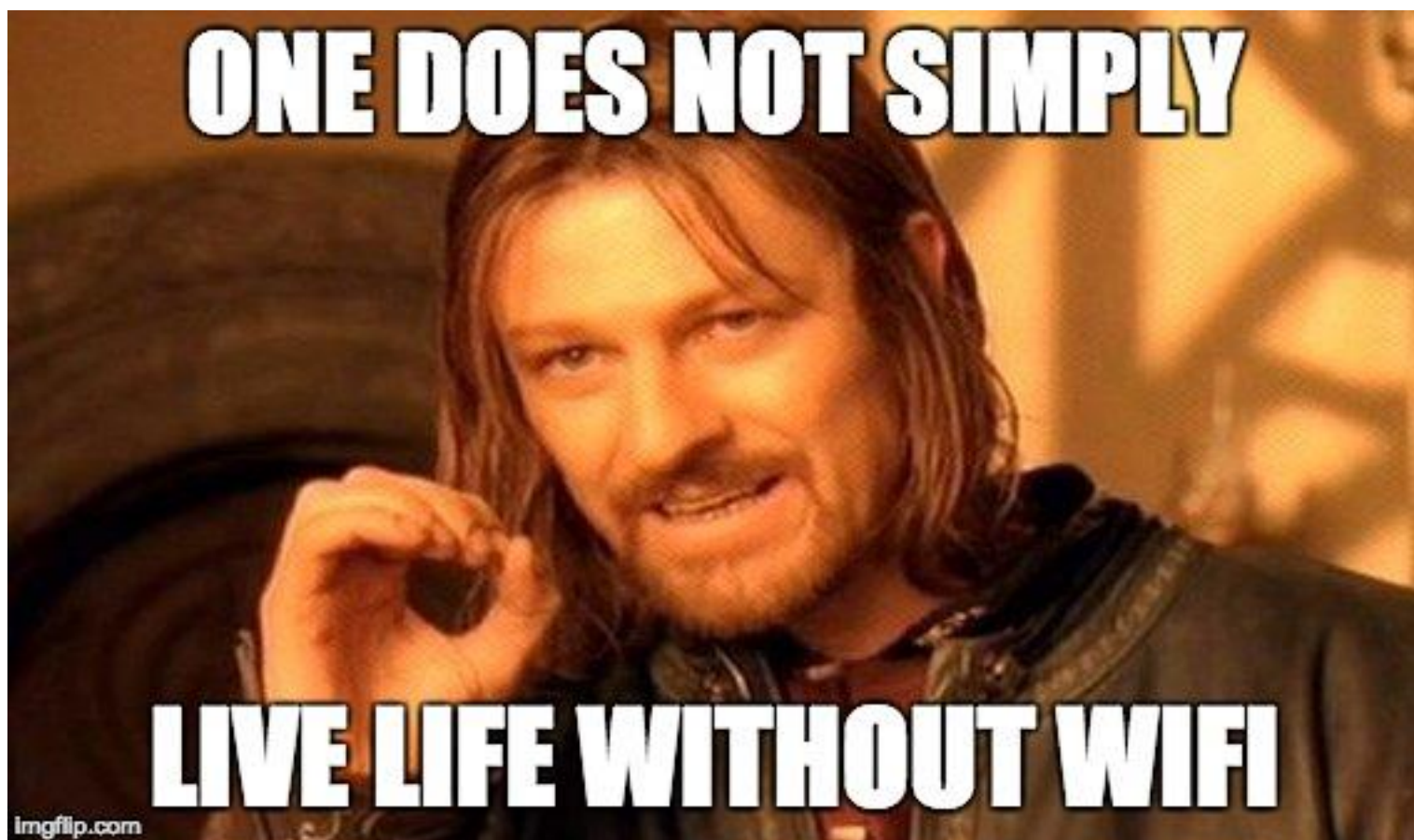
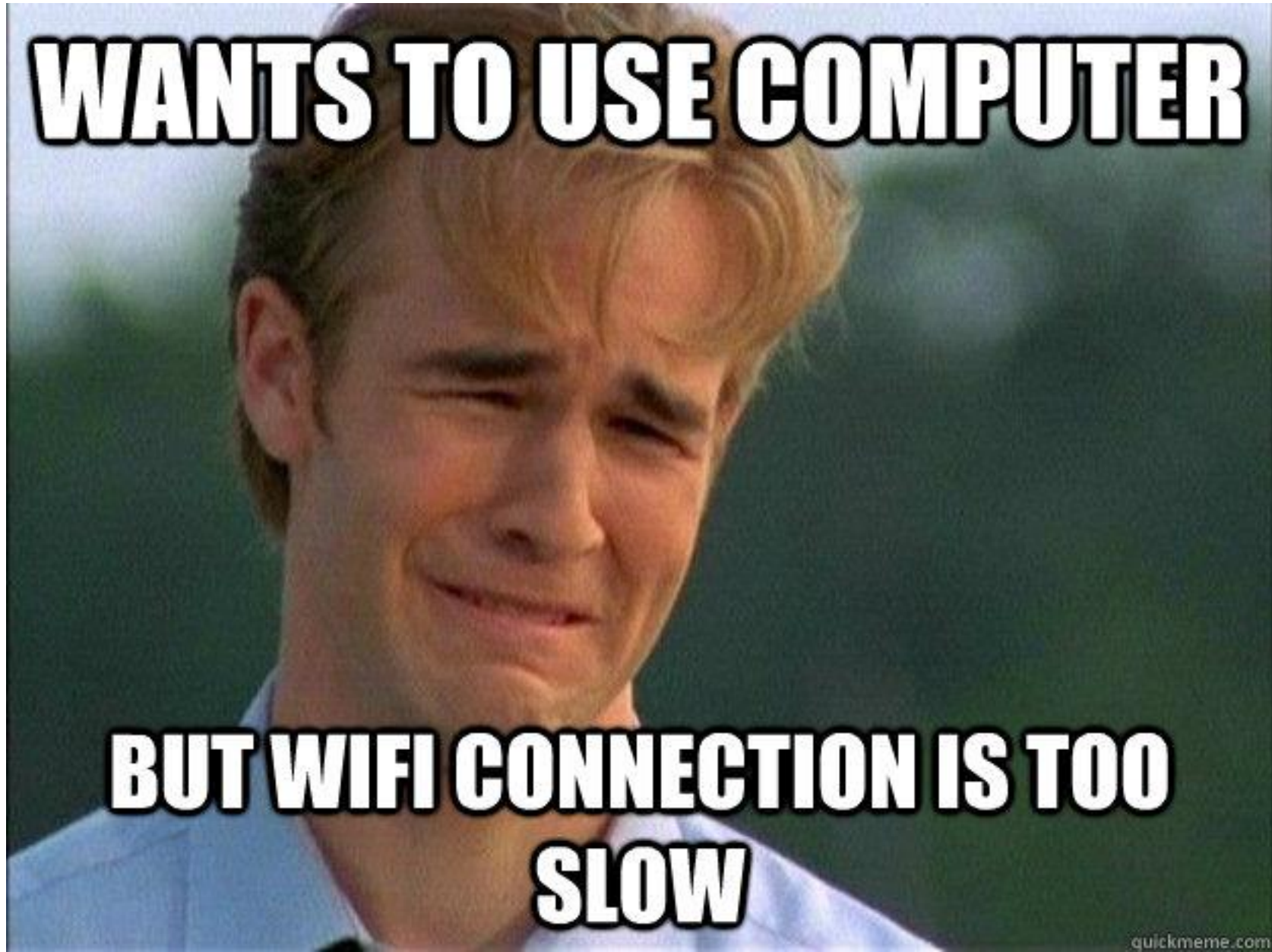
Can I really build an all-wireless office?

The plan!

- Why go 'all-wireless'?
- What do Cisco IT do?
- Some design top-tips and things to consider
- Lunch!

Aligning network design to office design...







Paul Murphy @murppaul

Jan 28

Just a quick heads up. No wifi in the toilets. @NavFazal
@AlyssaHabing @bbelding #CLEUR

Expand

What do Cisco IT do?

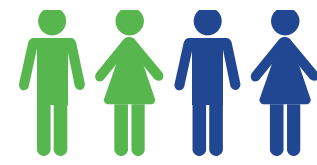
Cisco at a Glance



93
Countries



458
Offices



136,502
Connected
Stakeholders



74,807
Employees



3,890
Routers



28.8MW
Data Center
Capacity



6,572
LAN Switches



85PB
Overall Usable
Storage



13,632
UCS Servers



201,023
Connected
User Devices



60,914
Virtual Machines

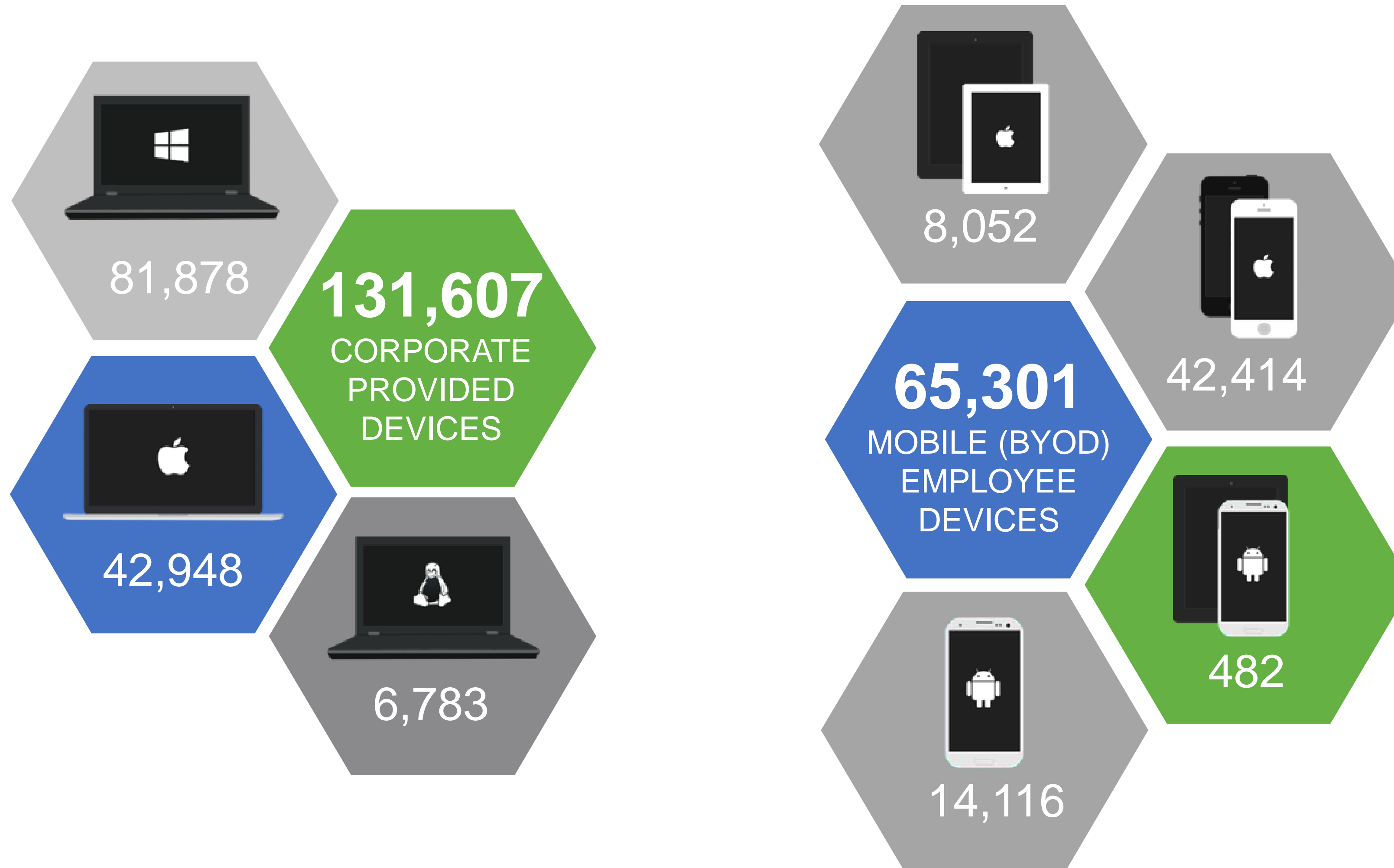


98
Services

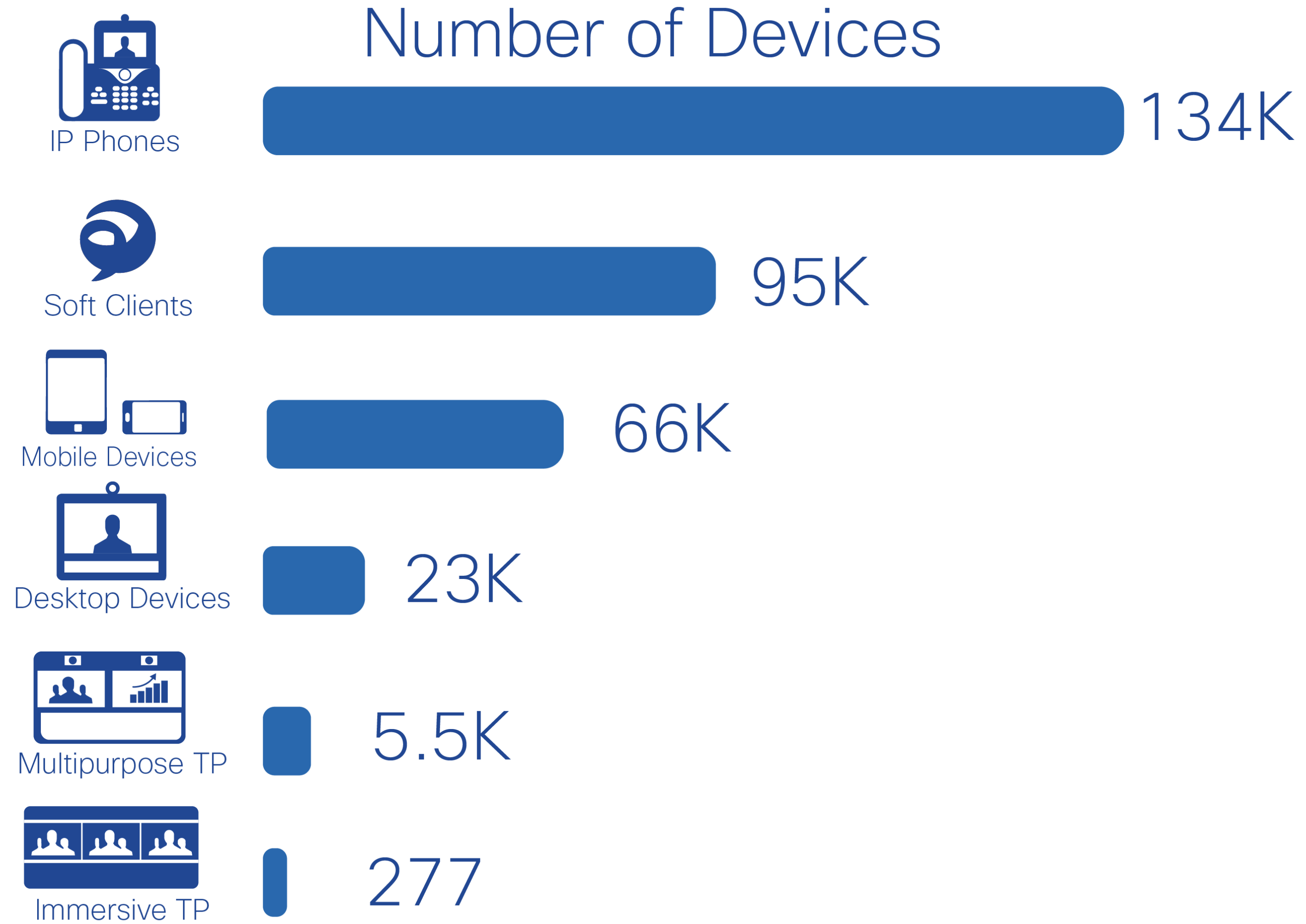


5.8 Billion
DNS Requests per day

Device landscape



Device landscape



Requirements

Challenges

Seamless connectivity

Wired vs. Wireless?

Availability

Business Insights

Performance

Loss/Latency sensitive apps

Reliability

High-Density

Cisco 'Connected Workspace' Project



Cool! How did they do it?

- 'Wireless as Primary'
- Collaboration technology
 - Desk phone, personal video unit, 'immersive' video, soft client? You choose!
 - Reduction in number of 'Hardware' phones
- Cabling stays in-situ



6,572

LAN Switches



571

Wireless LAN Controllers



10,000+

Wireless Access Points



29,166

Home Access Routers (CVOs)

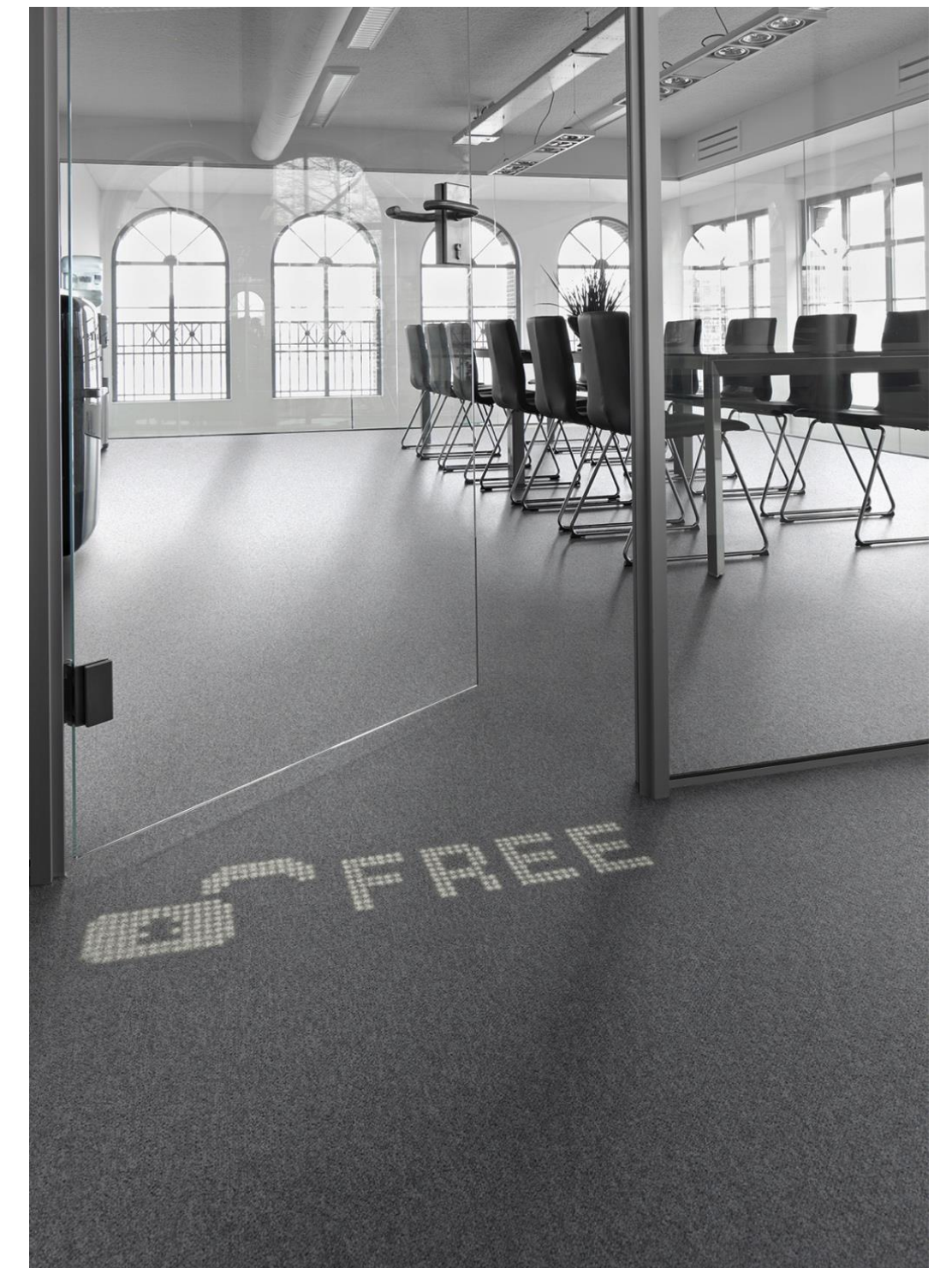
Cisco IT - wireless design

- 'Wave 1' 11ac AP's global standard (Cisco 3700)
- 'Wave 2' 11ac AP's standard in Cisco Meraki offices
- Consistent user experience globally in all offices (including home offices)
 - Blizzard (802.1x MSCHAPv2, 5GHz only)
 - Internet (Open + WebAuth)
 - Using RADIUS to control access
- BYOD use Blizzard (with MDM)
- Location services enabled
- 5GHz centric design (2.4 available via 'Blizzard-Legacy')

‘All Wireless Office’
or
‘All Wireless User Experience’?

Getting the right balance of Ethernet & Wi-Fi

- It's a question of overall capacity
 - If it doesn't move, plug it in.
 - TelePresence, Badge Readers, Lighting, Cameras, Carpets, HVAC etc
 - Access Points need to be within 100m of a switch
 - Freeing up RF for increasing number of devices without Ethernet
 - 50% of the networked devices in Cisco are not wireless
 - Our switching business is still growing
 - **Collaboration strategy will be a big determining factor**
 - 'Employee Choice'
 - Catering for users who prefer desk-phones to soft clients
 - Desk-phones \approx switch ports



PHILIPS

Just because you can, doesn't mean that you should...

Some things to consider...

Who are your stakeholders?

- Not just IT
 - HR?
 - Facilities → ‘Digital Workplace’?
 - What are *their* requirements?
- Vodafone ‘Better Ways of Working’
 - Nearly 200% building occupancy – remote workers in-scope?
 - Add’s, moves & changes - £3m saving/pa
 - ‘Environment helps to attract & retain the best talent’



<https://www.vodafone.co.uk/business/why-vodafone/better-ways-of-working/index.htm>

RF Design

- It's important.
- Listen to Jussi 😊

QoS

- If you're rolling out soft-phones...
- Does the client correctly mark upstream traffic?
- Does your infrastructure support per-application QoS to remark if it they don't?

Rule #1

Definition

This rule will be enforced on traffic matching *any* of these expressions.

Per-client bandwidth limit

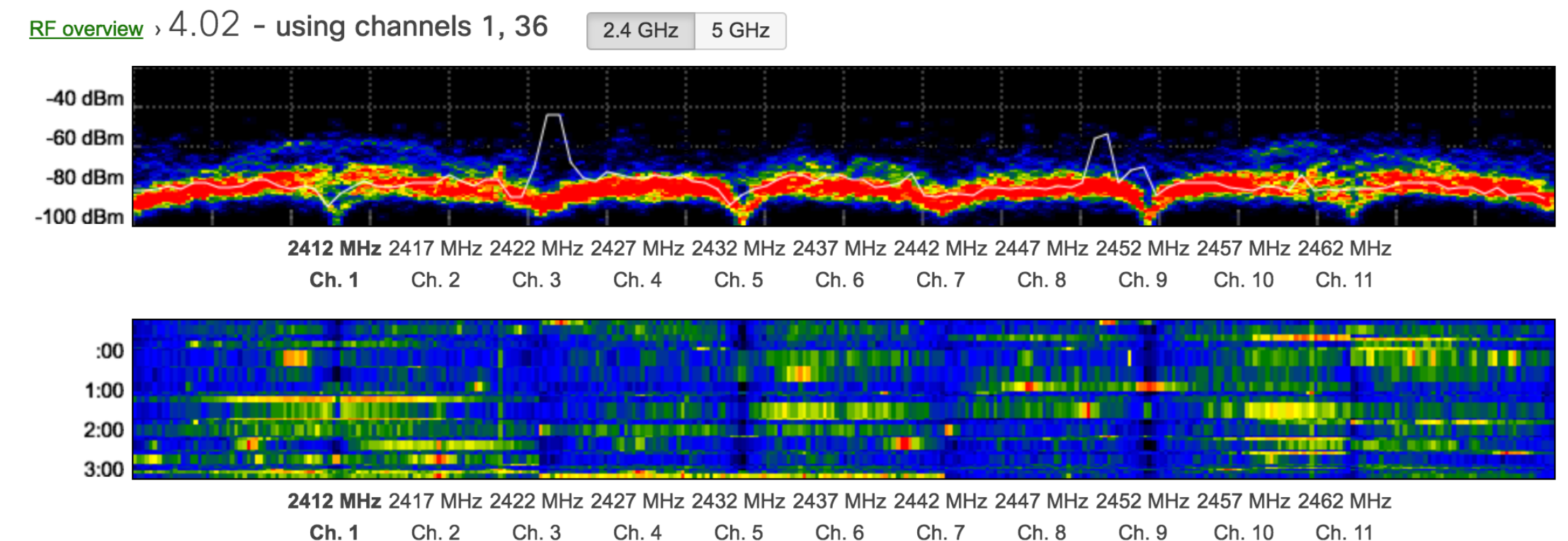
PCP / DSCP tagging

 /

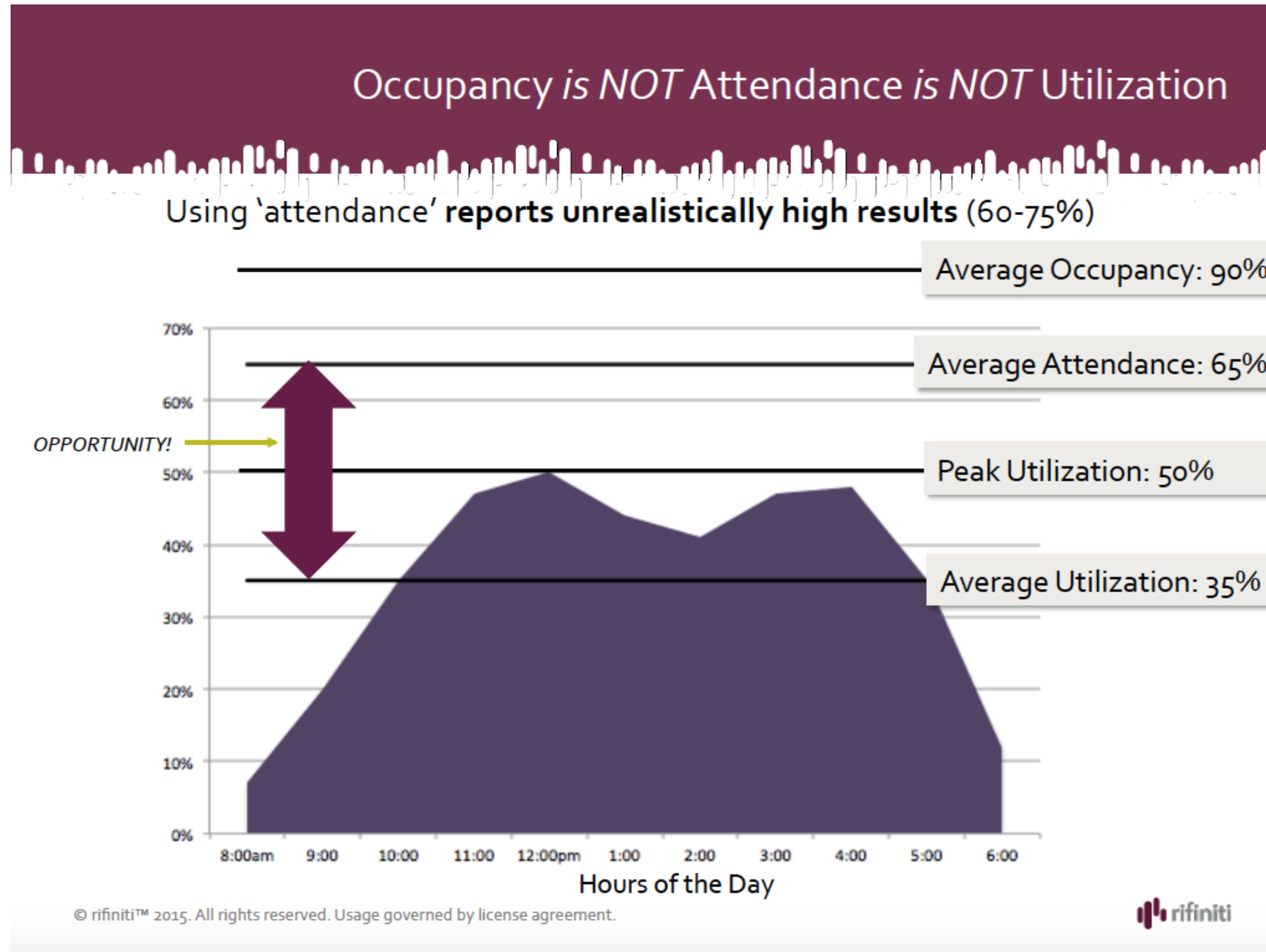
[Add a new shaping rule](#)

Availability

- When Wi-Fi is 'Primary', expectations are different.
 - Consider overall availability of the network.
 - Any radio network can be disrupted accidentally/maliciously by someone with the right equipment
 - Ethernet as fallback?
- Control plane redundancy (Controller, 'Controller-less', Cloud...)
 - Radio Resource Management – Coverage Hole Detection
 - Detect & remove interference



Location Services



So, can you really build an all-wireless office?

- Probably. But it's generally not advisable. An 'all-wireless user experience' should be the goal.
- Greenfield (office move/refurb)
 - Significant cost savings on cabling/infrastructure for 'Wireless as Primary'
 - Many 'soft' benefits
 - Employee satisfaction & productivity are important. Consider Collaboration strategy.
- Brownfield (upgrading/changing existing access layer)
 - 'Soft' benefits
 - Cabling is a sunk cost – removing it is expensive
 - Cost savings realised at switch refresh time
- **'Layer 1' design is critical**
 - RF site survey (using Ekahau tools 😊) is essential.

THERE IS ALWAYS SOMEONE



WILLING TO DO IT CHEAPER

Thanks!