LAN Technology Directions and Opportunities for Managed Services

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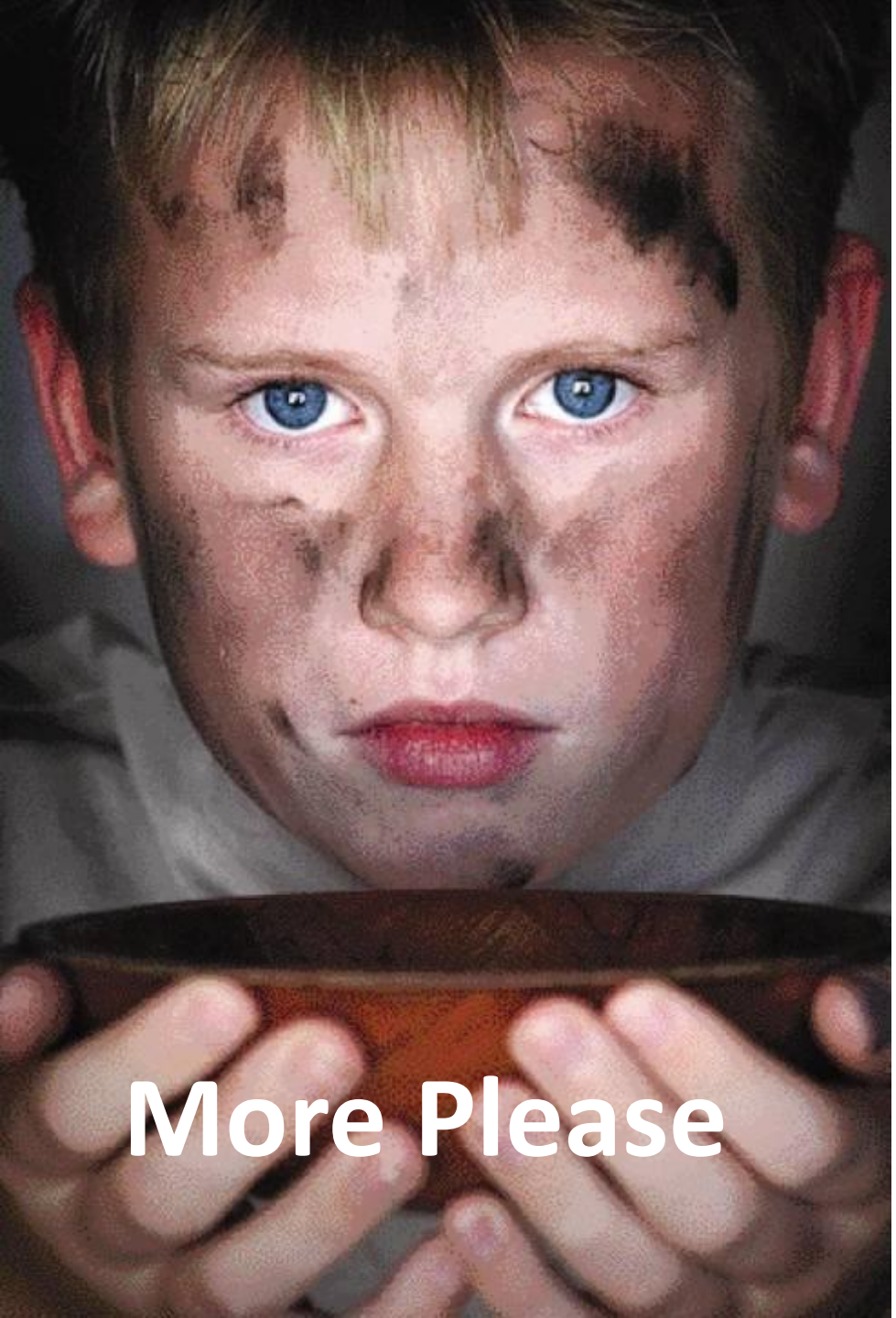
The Forces Driving Change in the Campus LAN

- Digital Transformation
- The Interactive Cloud
- Mobility
- IoT
- Security



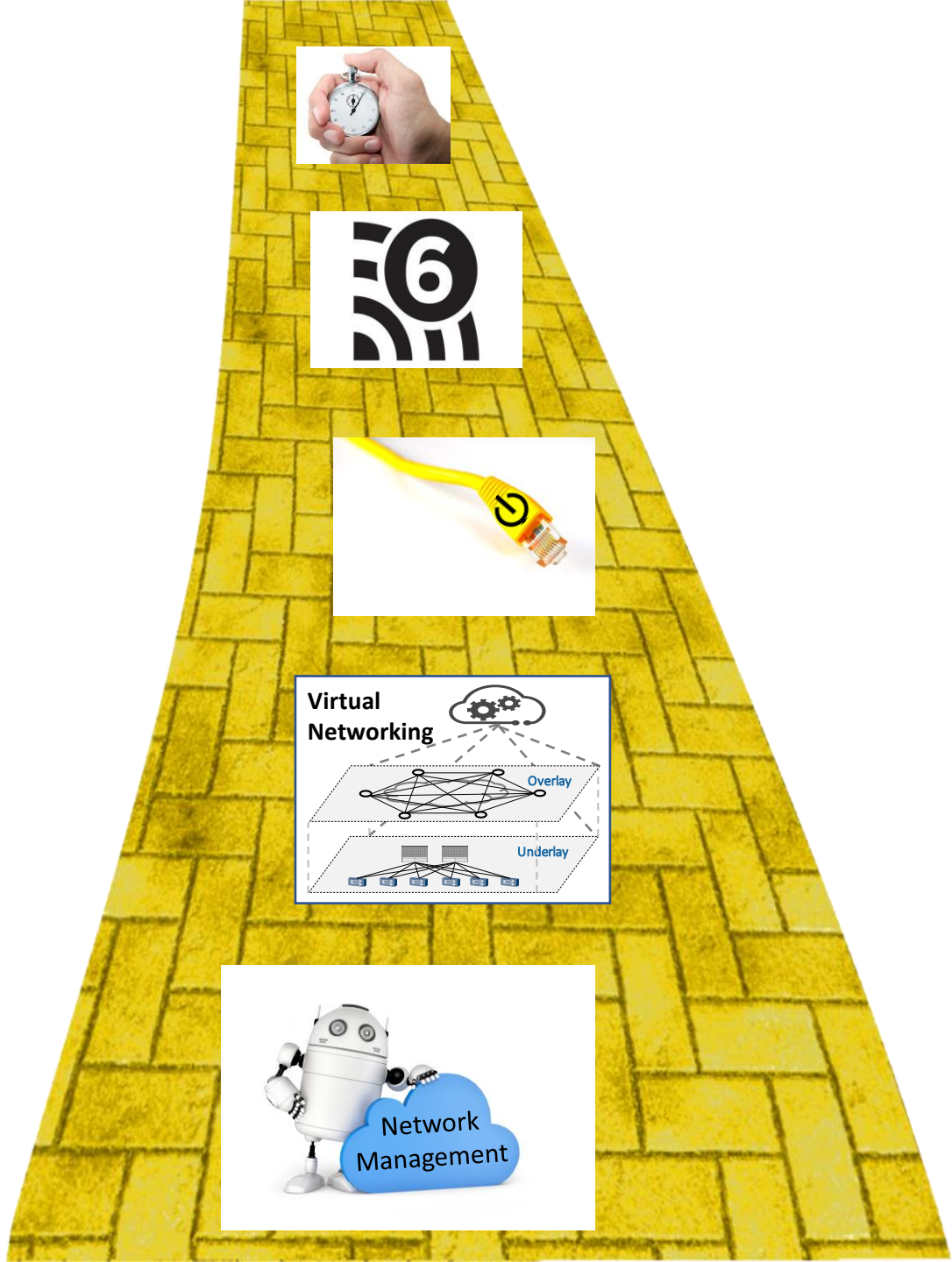
Changes Bring New Requirements

the need for more…

- More Scale
- More Coordination
- More Performance
- More Reliability
- More Synchronization
- More Security

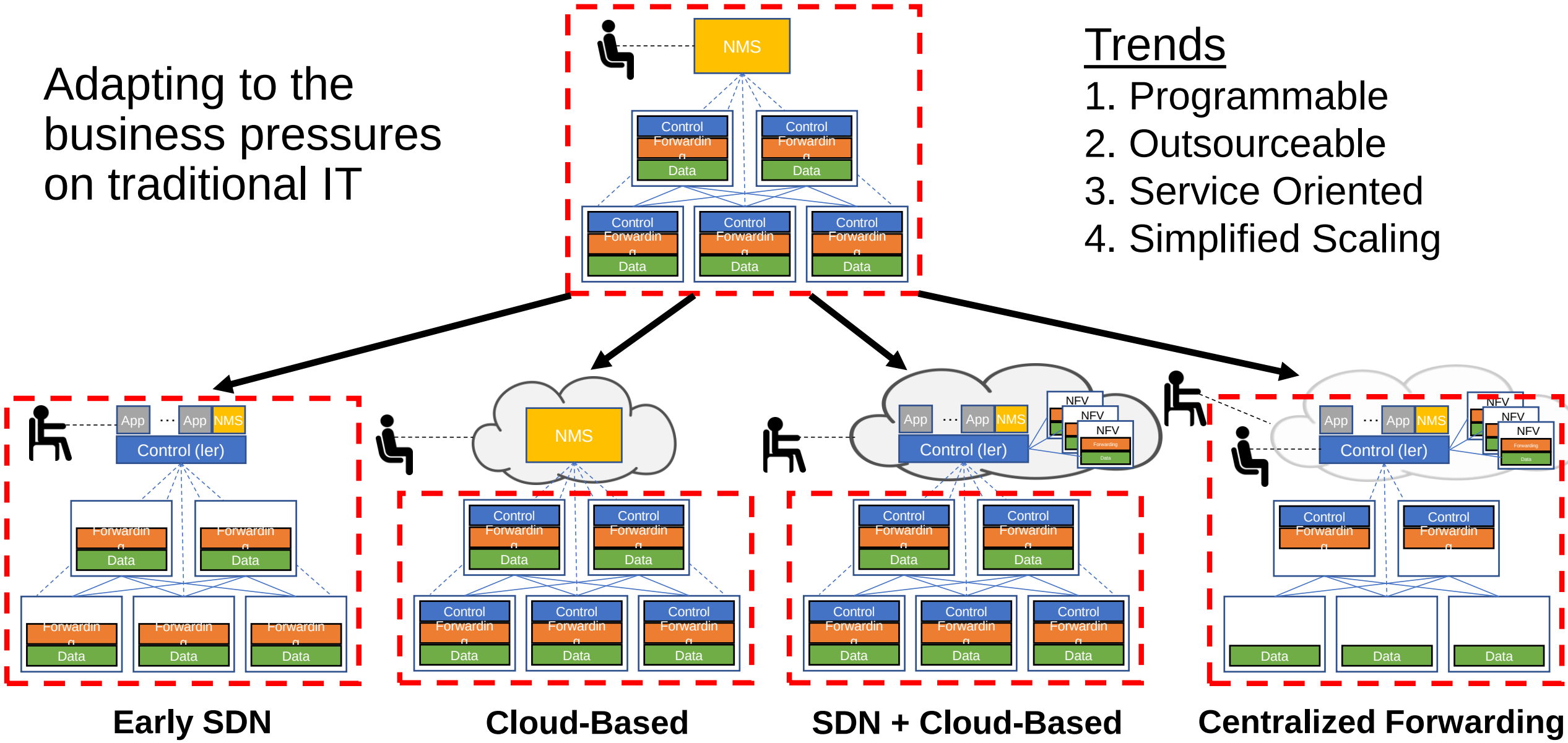
Technical Trends and Innovation in the LAN

- LAN Management Architectures
- Virtualization in the LAN
- Multi-Gigabit PoE
- WiFi6 and Beyond
- Timing and Synchronization



LAN Management Architectures

Adapting to the business pressures on traditional IT

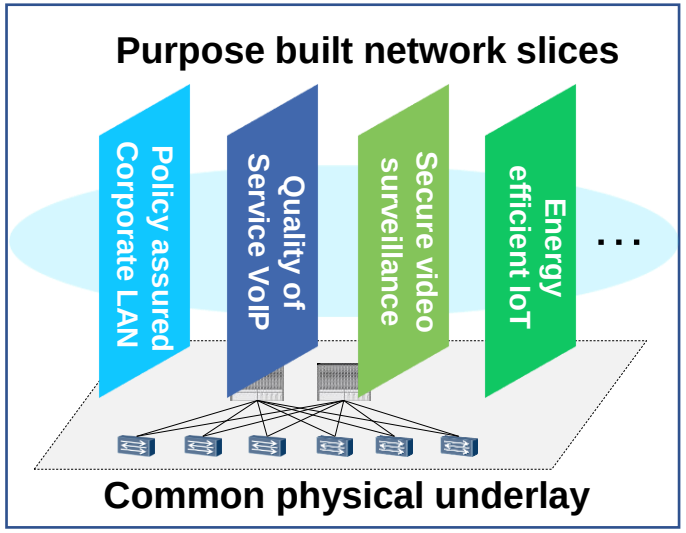


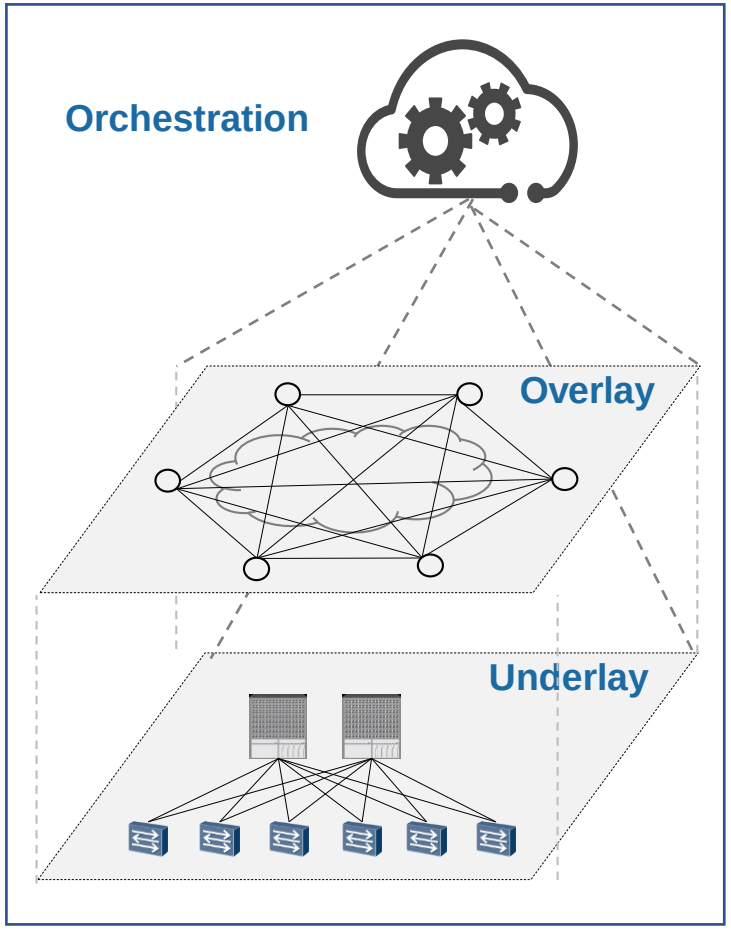
Trends

1. Programmable
2. Outsourceable
3. Service Oriented
4. Simplified Scaling

Virtualization in the LAN

- Founded on standards-based technologies – but, no interoperability, so no standards!
  - VxLAN encapsulation, LISP auto-provisioning, 802.1X authentication
- Benefits for a Managed LAN
  - Link the SD-LAN -> SD-WAN -> Cloud Services
  - Multi-tenant infrastructure
  - Service Level Agreements
- Implications
  - Encapsulation HW likely requires upgrades
  - Orchestration SW needs to be vendor agnostic





Multi-Gigabit PoE
Driven by WiFi innovation

1G-PoE has had a long run…

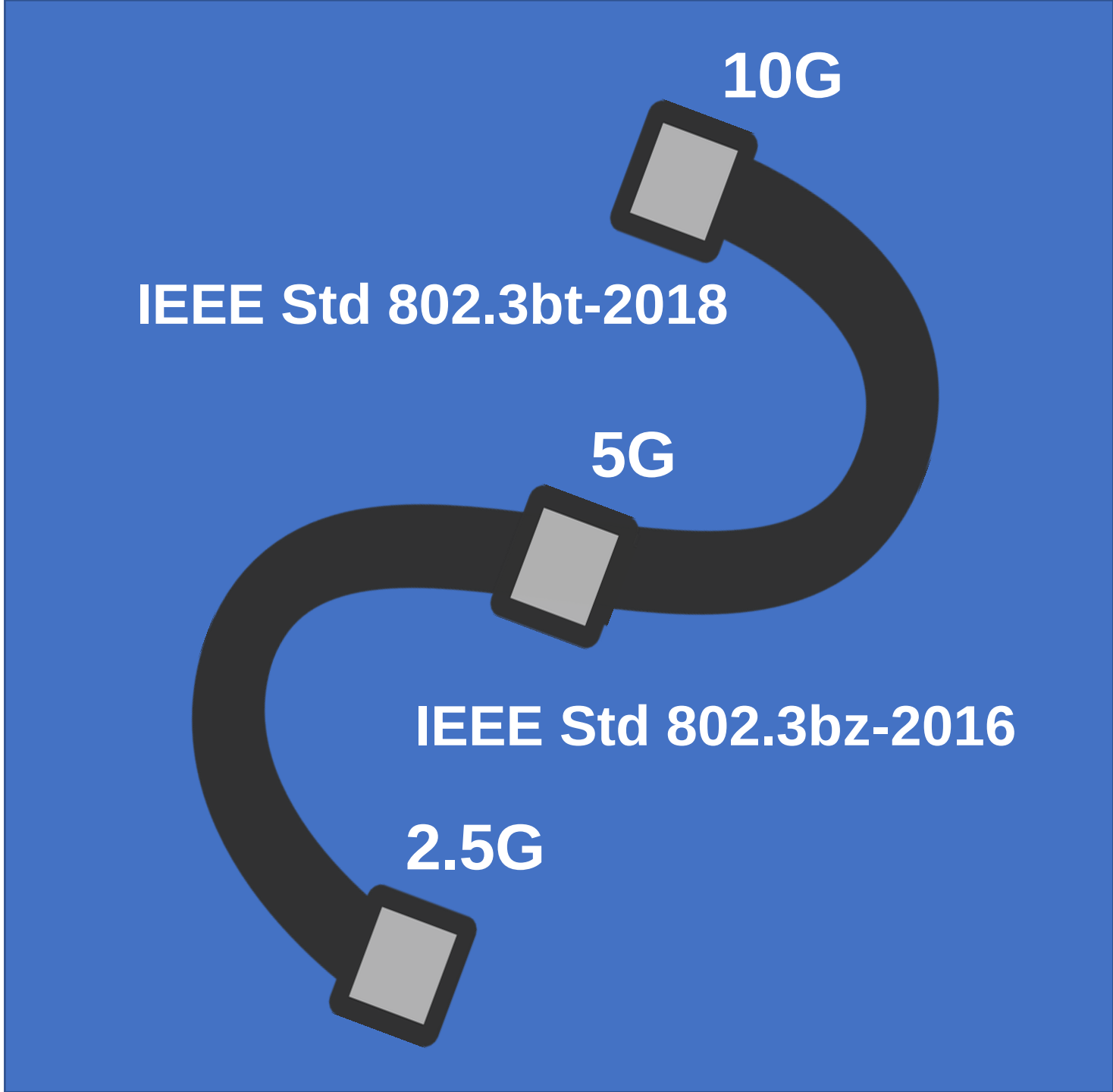
- First introduced in 802.1af-2003
- Billions of ports and existing cables

WiFi keeps getting…

- Faster
- More power hungry
- More sophisticated (see next slide)

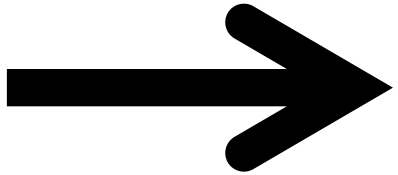
What does this mean?

- Upgrade Cycle!
- Faster access => Faster fiber uplinks
- Door opener for Managed Services

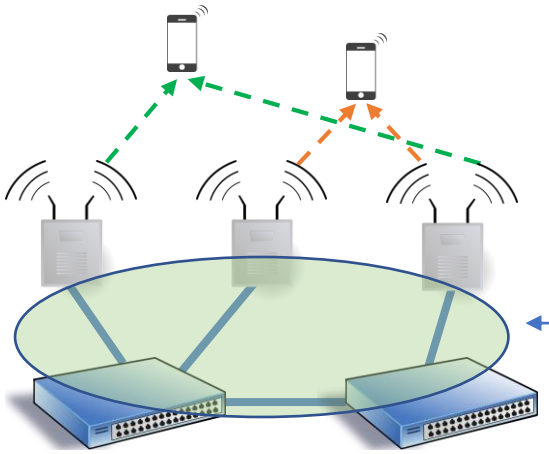


WiFi 6 and beyond

More capacity, more density, more coordination



- IEEE Std 802.11ax-2019
- 9.6 Gbps via 8 streams
- Mu-MIMO and OFDMA
- Higher density and higher throughput

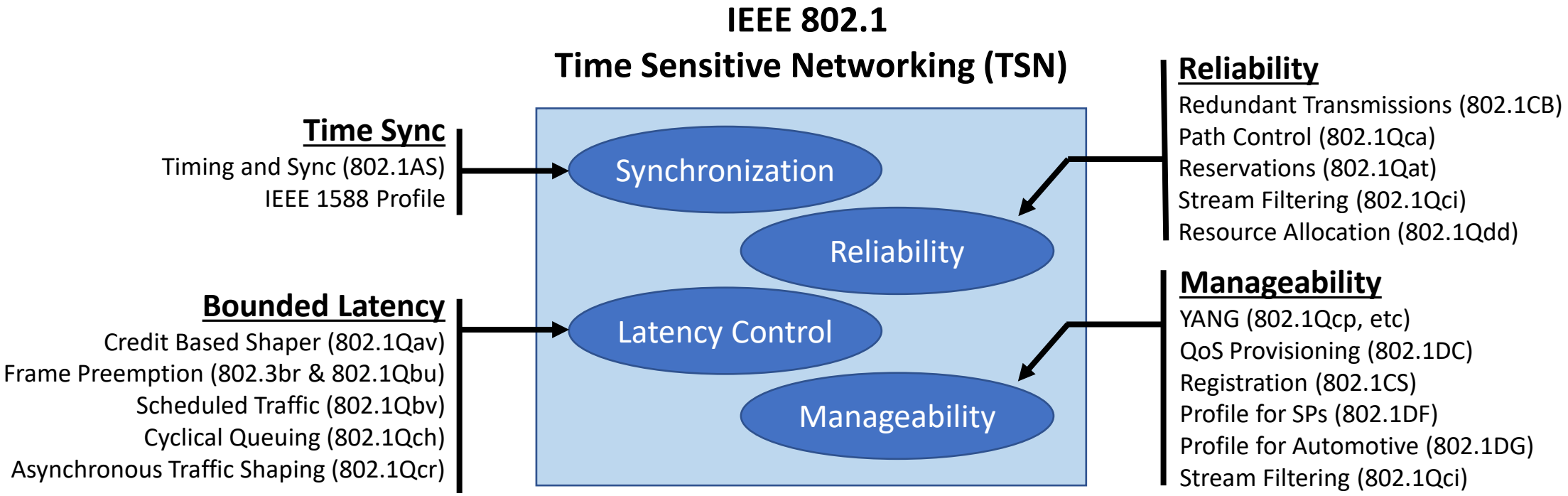


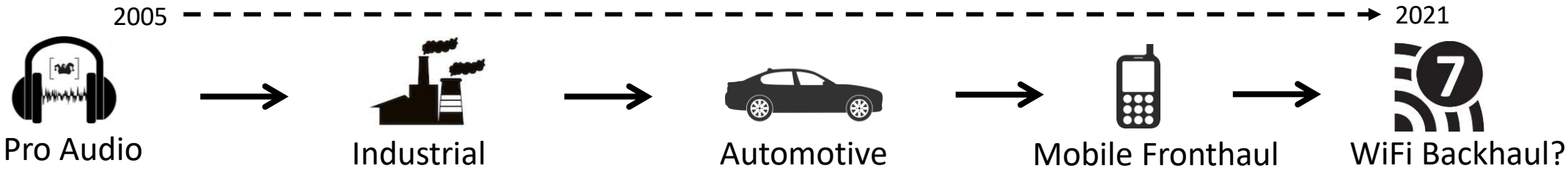
- IEEE Std 802.11be-2021(?)
- 320MHz bands, 16 streams
- Lower latency and higher throughput
- **Multi-Ap Coordination**

Is it time for a
time synchronized backhaul?

Timing and Synchronization on the LAN

Trending from niche to mainstream





Never Forget About Security

Scaling up with IoT and Mobile means…
a great attack surface

Everything in the cloud means…
more exposure to threats

World markets and increased regulation mean…
more compliance requirements

Implications

1. Top consultative engagement with the customer
2. Use case for LAN virtualization
3. Use case for Service Provider analytics

Why Now is the time for Service Providers

1. The upgrade cycle is now!
   - WiFi impacts the wired LAN
   - Embedded virtualization in the access layer
   - Timing and synchronization enablement

2. Management architectures focus on services
   - SDN standardized and abstracted the network
   - Cloud-based management enables outsourcing and multitenancy

3. New LAN technologies are complex
   - Unlicensed interplay with 5G and WiFi
   - Aligning SD-LAN with SD-WAN
   - End-to-end SLA assurance

4. Security demands continue to grow
   - A bigger attack surface brings the need for policy enforced isolation
   - Increased compliance and vulnerability for business

Success Factors for Managed LAN Service

Managed LAN Service is about replacing or augmenting existing IT

- You must take advantage of upgrade cycles
- You must have a customer relationship
- You must have an aligned business focus (small, medium, large Enterprise)
- You must have the correct tools

Tools

- Cloud driven remote management – scalable and cost effective
- Standards based virtualized LAN infrastructure
- Deployable next generation WiFI
- Multi-tenant analytics platforms to curate data
- Security and compliance solutions for the LAN
- Means for defining and delivering SLAs on the LAN