COMMSCOPE®

Network Convergence – A Network of Networks

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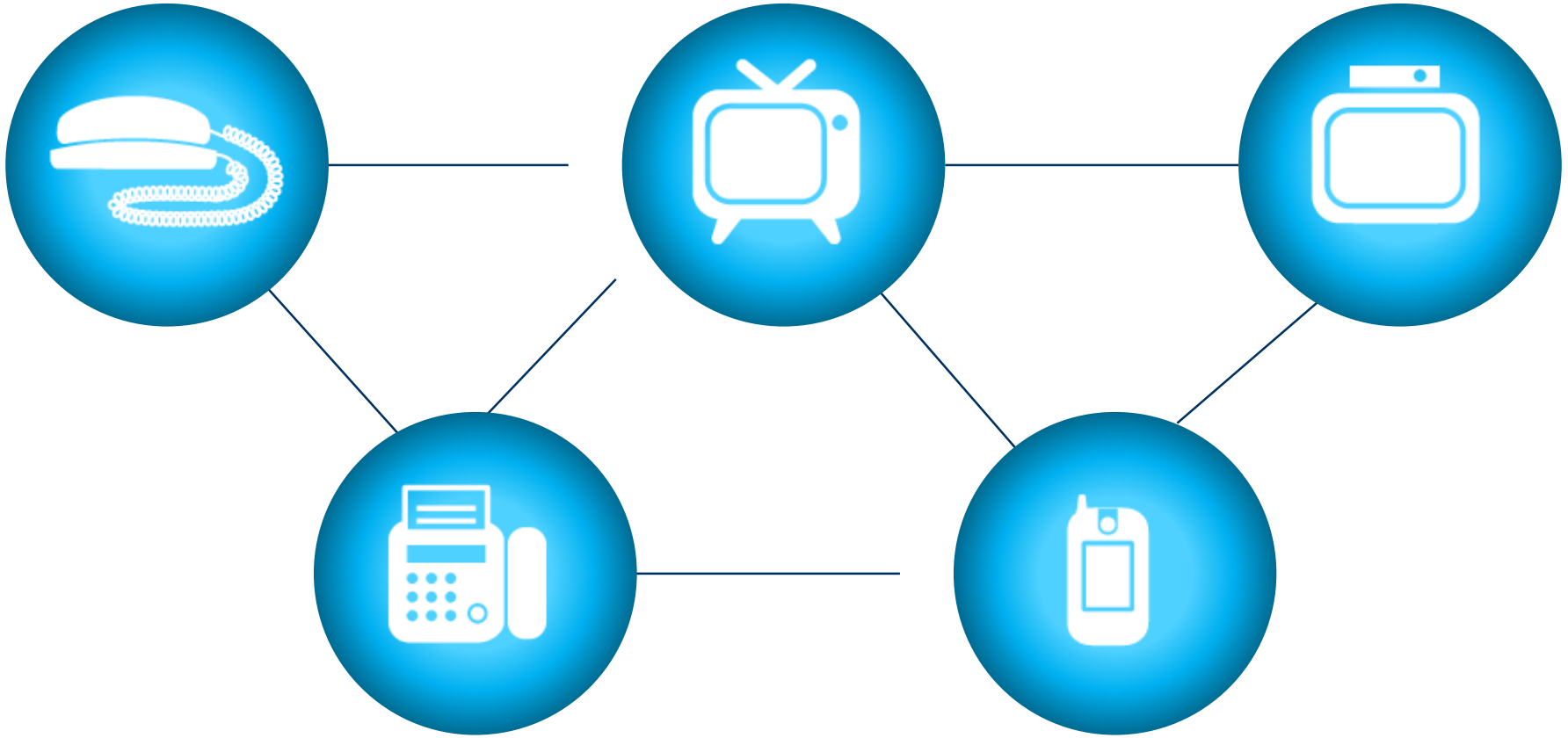
Just a few short years ago…



We are moving toward a converged world.

More subscribers and devices to connect, as fiber expands into the access to supply more bandwidth.

WIRELINE BROADBAND

500
service providers
plan to launch FTTH services in North America by 2020 [1]

30M
new subscribers
to be connected by broadband in Asia-Pacific 2016-17 [2]

WIRELESS BROADBAND

150M
5G subscribers
by 2021 [3]

2.5M
LTE small cells
to be deployed from 2016 to 2020 [4]

The demand for fiber connectivity is **unprecedented**

MORE BANDWIDTH

8X
mobile data traffic growth
from 2015 to 2020 [5]

330M
4K UHD TVs
sold by 2019 [6]

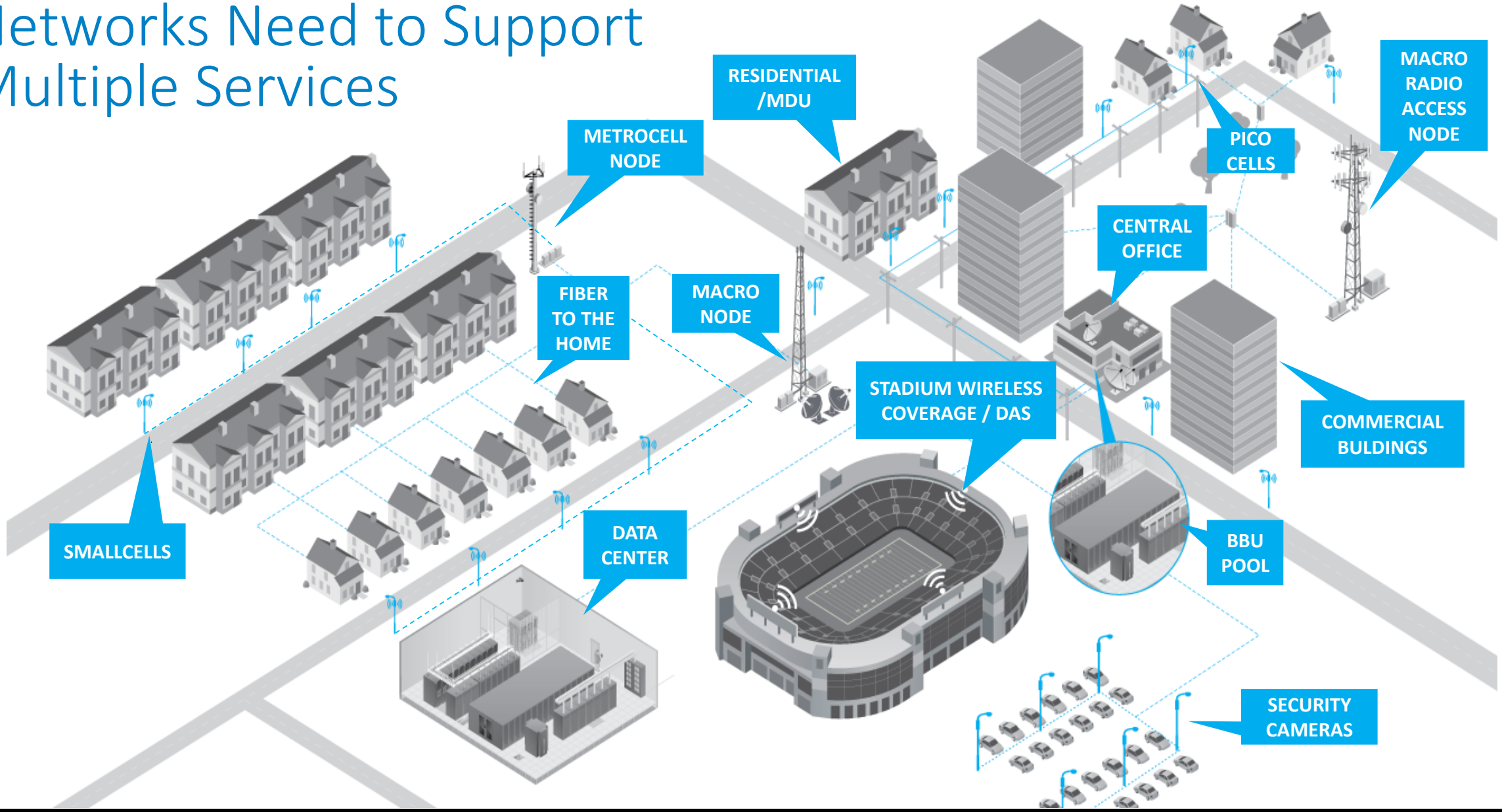
INTERNET OF THINGS

3.1B
M2M connections
by 2020 [5]

601M
connected wearables
by 2020 [5]

1. FTTH Council Americas 2. FTTH Council APAC/Ovum 3. Ericsson Mobility Report 2/16 4. ABI Research 5. Cisco VNI Mobile, 2016 6. Parks Associates: Connected CE 10/15

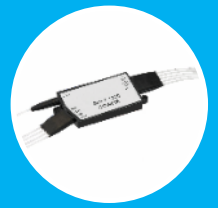
Networks Need to Support Multiple Services

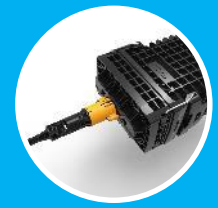
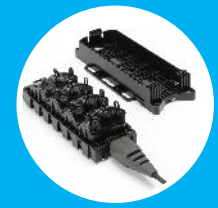


The Evolution of the Wireline Network

Priorities

- Speed of Deployment
- Network Capacity
- Multi-Service

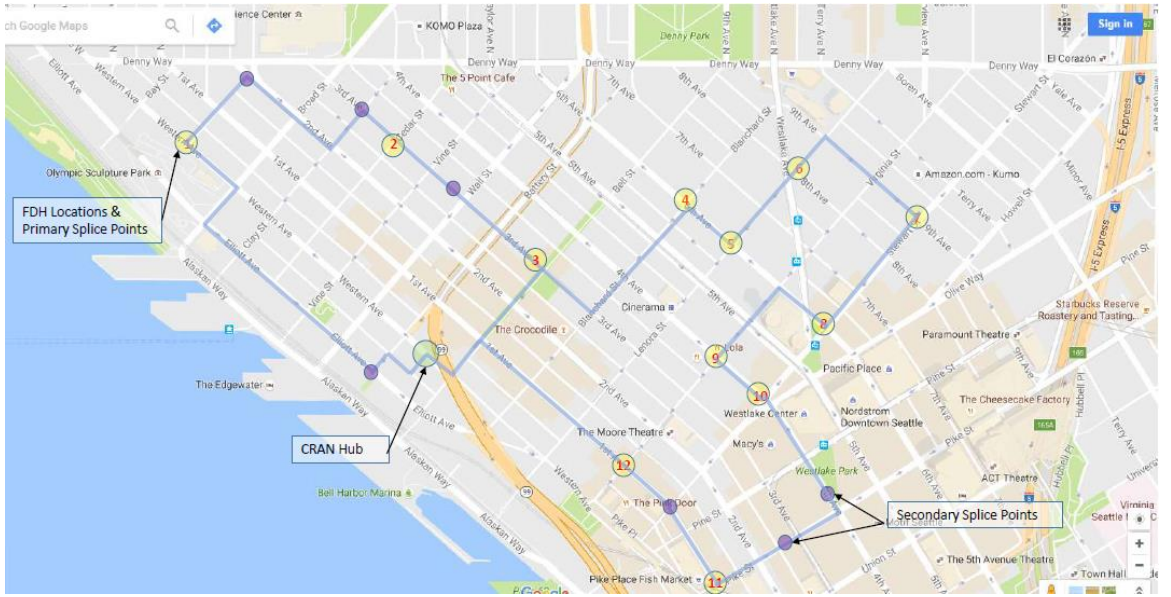





Needs

- Simplicity
- Efficiency
- Flexibility
- Easy Installation

OSP Cable Network Design Considerations

- OSP fiber cable should be sized to the maximum number of fibers possible
- Cable routes need to consider business customers and wireless networks access, not just FTTH
- Cable installation practices need to meet municipal and geographical requirements while providing most flexible access point

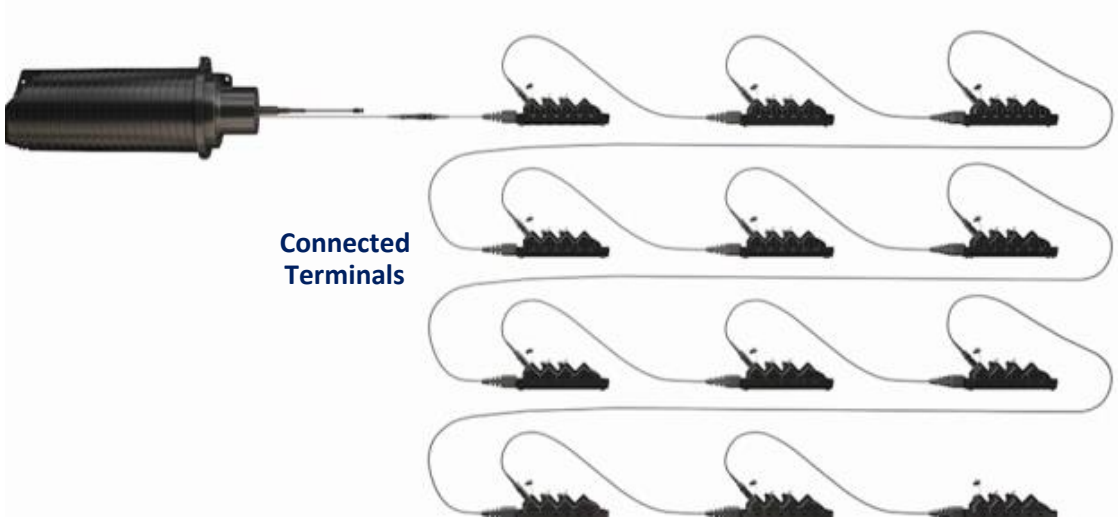


OSP Access Network Design Considerations

- Access solutions need to be flexible to accommodate Direct Connect, FTTH Drops and DWDM's for Wireless
- Modular plug & play solutions allow flexible deployment options within a common architecture
- Consider hardened fiber connectors to enable faster and more cost effective service turn-up

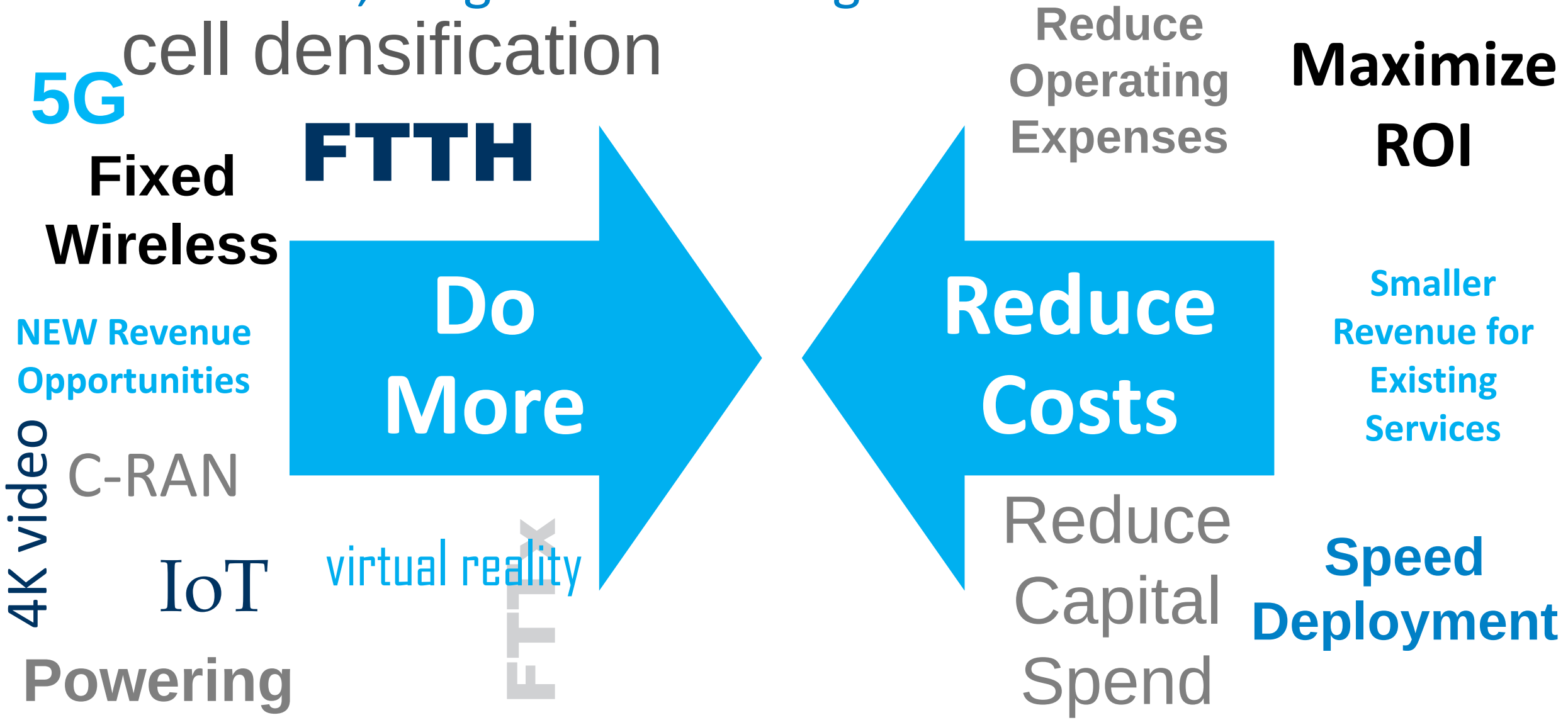
Access Terminals

Distribution Hubs



Connected Terminals

The dilemma, megatrends driving fiber



What To Do?

Evaluate Network Architectures that Speed Deployment and Add Flexibility

1. Evaluate Different Splitting Architectures to Reduce Costs / Free Up Fiber
2. Hardened Connectivity to Speed Deployment and add points of flexibility
3. Points Of Flexibility to allow for New / Reconfiguration of services
4. Evaluate Emerging Technology (Power, Path Redundancy, Maintenance Challenges)

① Evaluate Different Splitting Architectures to Reduce Costs / Free Up Fiber

Why?

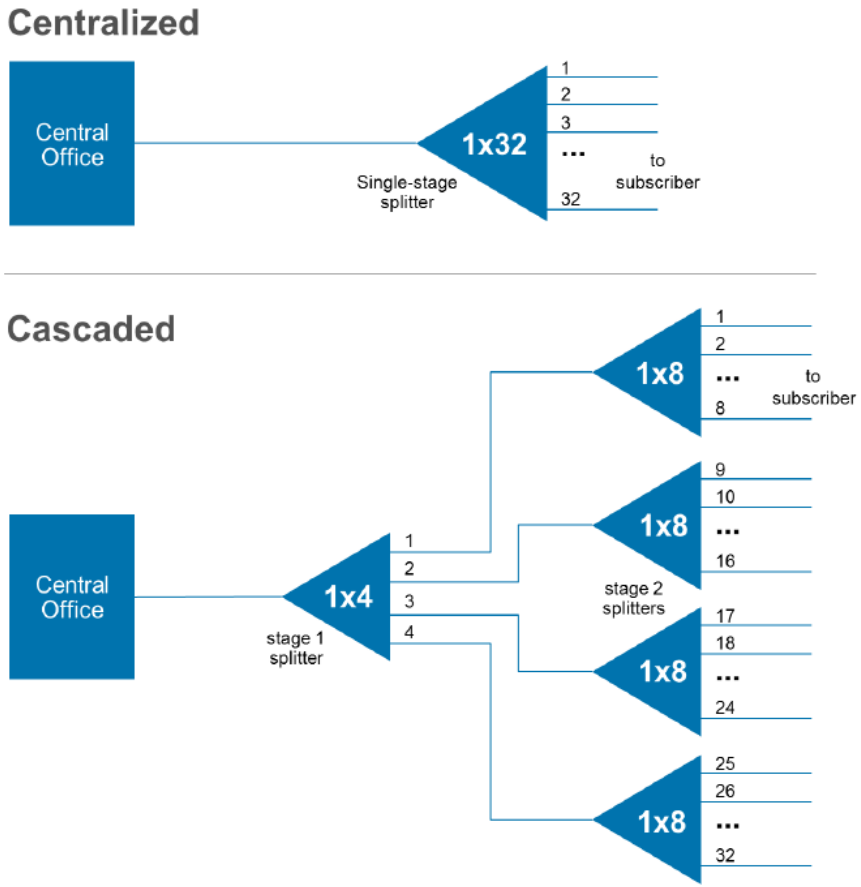
- Reduces fiber required for FTTH / Free up fiber for other applications
- Allows for building a network to an expected “Take Rate”

Challenges to Consider:

- Increased OLT costs
- Challenges with IT provisioning systems

Methods:

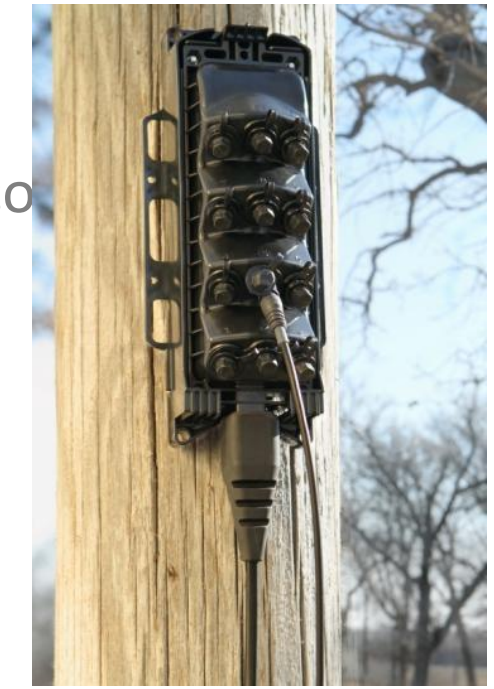
- Cascaded split at FDH and Terminals
- Distributed splits at Terminals
- Tap Splits
- Connectorise Splitters and Fiber to Maintain Flexibility for Upgrades



② Hardened Connectivity to Speed Deployment and Add Points of Flexibility

Why?

- Hardened Connectors replace splices reducing total installed co
- Points of flexibility for reconfiguration of networks



Challenges:

- SKU / over-length Management
- Cleanliness / Craft interaction

Types:

- Single Fiber
- Multi-Fiber

3 Points Of Flexibility to Allow for New / Reconfiguration of Services

Why?

- Gives quick access for turn-up of **new applications**
- Allows for reconfiguration
- Reduces future splicing costs

Challenges:

- Documentation and Management

How:

- Keep Points of Flexibility (like traditional FDH's) with more functionality
- Can be hidden as access is not as common

4 Evaluate Emerging Technology (Power, Path Redundancy, Maintenance Challenges)

The Industry needs to keep innovating to continue to solve the next generation of problems presented by the trends.

Power

- Small Cells
- Wi-Fi
- Fixed Wireless Drops
- Cameras
- IOT

Protection

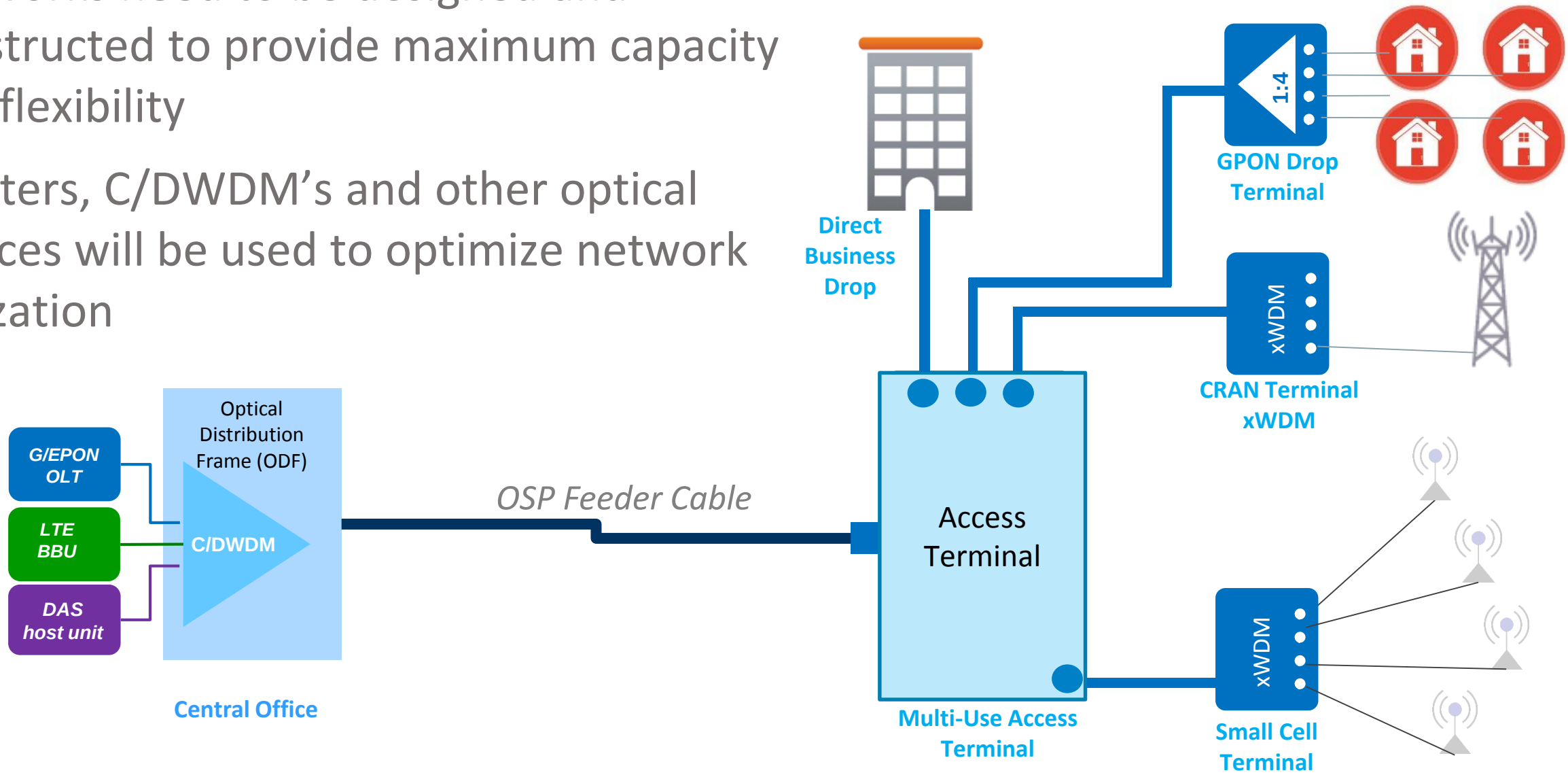
- 5G reliability
- Cell Backhaul
- High Cap/ Lifeline Services
- Move from Luxury to Necessity

Fiber Ease of Use

- Fiber going more places
- Inexperienced Technicians
- Home Owners

CONVERGED NETWORK ARCHITECTURE OVERVIEW

- Networks need to be designed and constructed to provide maximum capacity and flexibility
- Splitters, C/DWDM's and other optical devices will be used to optimize network utilization



Key Takeaways for Network Convergence

Convergence

Utilization of the network to address multiple market segments, adding additional revenue streams and de-risking the business case

The future is here

Demand for bandwidth and IOT will drive Metrocell densification deployments

Flexible

Network operators need to be able to support multiple network applications on a single network

Network friendly

Network architecture and product selections need to focus on providing the Density, Accessibility and Flexibility needed for the future

How can we help you?

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