



CORNING

NextGen Data Transport Architecture

Accessing Data at the Speed of Light for Mission Success

“DoD is a data-centric organization that uses data at speed and scale for operational advantage and increased efficiency...DoD needs a foundation for a new networked way of war that brings together sensors and machines that will revolutionize the battlespace and the logistics and support functions behind the front lines.”

- DoD 2020 Data Strategy

Our Recommendations Up Front

For the Air Force

- ❑ **Incorporate NextGen data transportation** requirements in future USAF facility/comm planning and execution
- ❑ **Update legacy facility specifications** to encourage greater deployment of NextGen data transport architecture
- ❑ **Issue program guidance or instructions** for development of a technology package and smart building systems to enhance mission operations.
- ❑ **Support** demo or pilot project at appropriate USAF facility.

FY22 Congressional Report Language

Next Generation Data Transport Architecture.—The Committee is aware of the need for enhanced data transport infrastructure to meet emerging network performance requirements for artificial intelligence and machine learning as well as supporting advanced manufacturing, microelectronics and quantum engineering. Each of these disruptive technologies requires significant additional bandwidth for increased data loads. As DoD undertakes large scale construction efforts, such as rebuild efforts at NAWS China Lake, Camp Lejeune, and Tyndall AFB, and continues to assess the applications for 5G and other data transmission innovations required for the base of the future, the Committee urges the study and certification of next generation data architectures and updates to the UFC and other policies to facilitate the use of new network architectures to allow mission owners and engineers to meet emerging data transmission requirements.

Installations of the Future

The committee notes the Department of Defense's efforts to develop "Installations of the Future" concepts for each of the services. The committee recognizes the need to ensure that these "Installations of the Future" concepts must have certain enabling technologies to ensure that the different applications and capabilities are able to function as envisioned. Further, the committee notes that National Defense Strategy and the Department of Defense 2020 Data Strategy highlights that the Department is a "data-centric organization that uses data at speed and scale for operational advantage and increased efficiency." As such, the committee is aware of the Department of Defense's future infrastructure requirements to meet rapidly expanding bandwidth and speed requirements to meet future needs.

Corning Understands USAF Challenges

Steep Demands, Little Time, Limited Resources

New “Data Dense” weapon systems are swamping existing networks and limiting full operational capabilities of the CJADC2 and ABMS

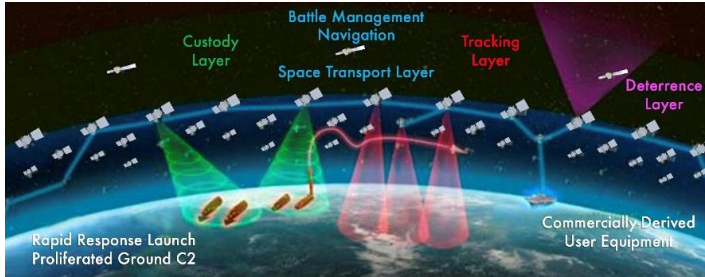


Artificial Intelligence and Machine Learning – “DoD must be Ready by 2025”

DoD must invest now in the underlying data transport architecture that enables an AI-ready force, AI-enabled applications, and technology.

Your data tsunami is here. Is the Air Force ready?

Data Demands are Growing



SDA National Defense Space Architecture

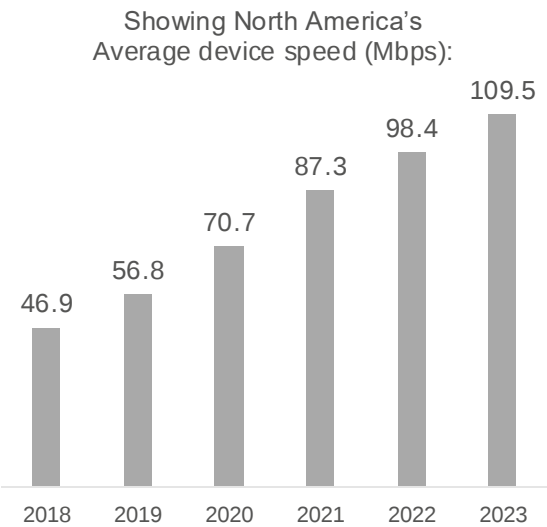


AFWERX Installation of the Future depiction

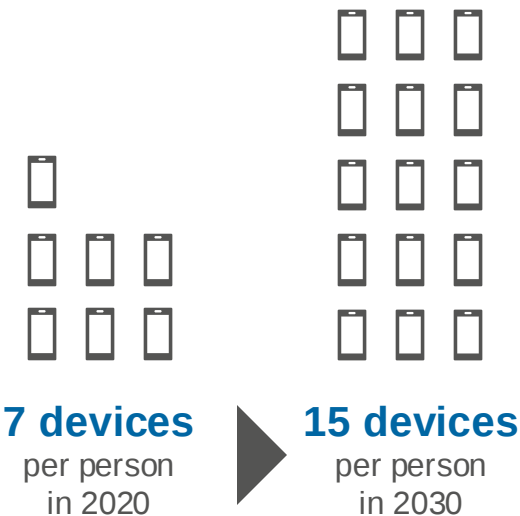
- Current DoD networks are being swamped, bandwidth problems growing exponentially
- Too many devices to connect each with independent cable
- Rising demand for bandwidth & power
- Copper has reached its limit and will not support future requirements.
- USAF needs a data transport architecture designed for higher bandwidth, security, and less cost.

Fiber Connectivity ready for **increased network demands**

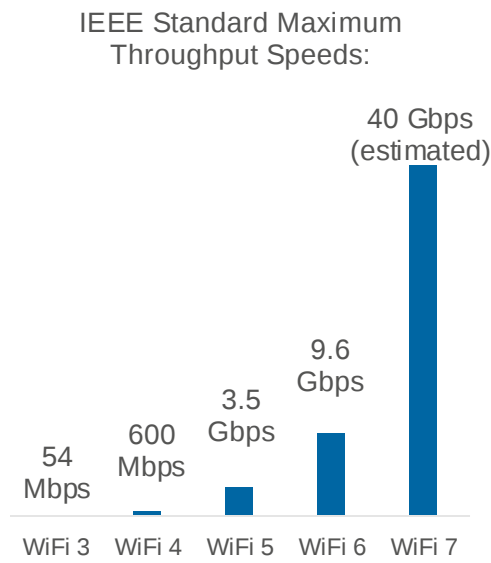
Wi-Fi connections keep getting faster, consuming more bandwidth



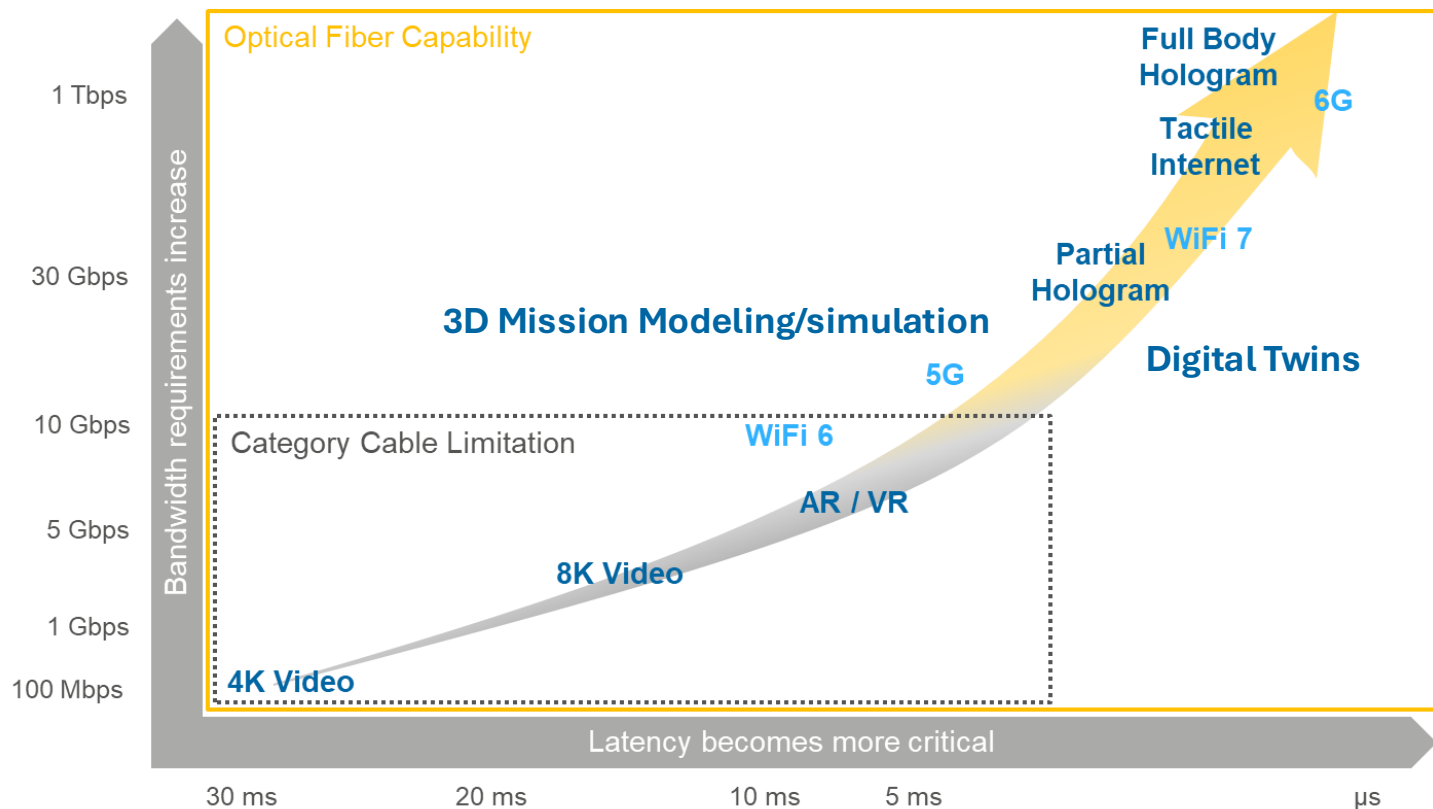
Average number of devices per person is expected to double by 2030



Wi-Fi 7 rollout is estimated to begin in next two years and require 32-40 Gbps

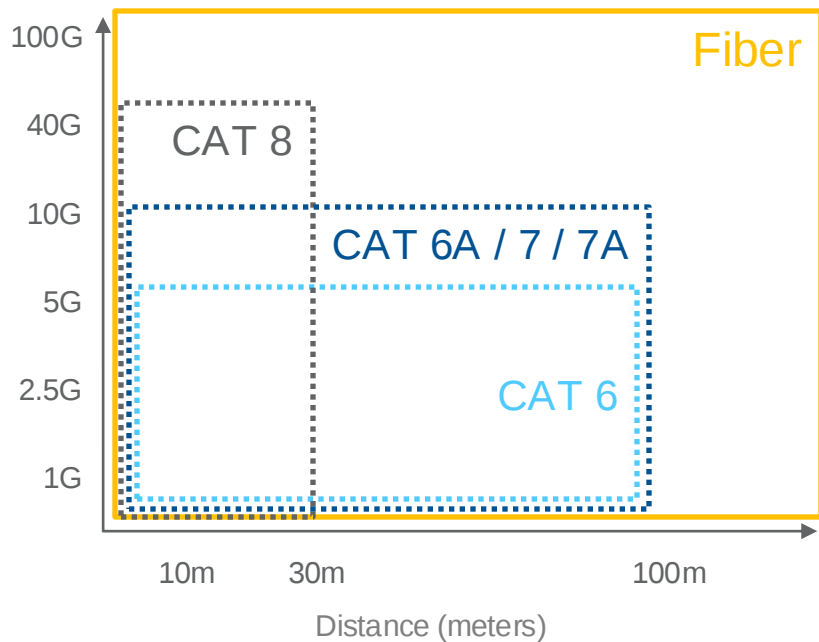


Fiber connectivity future-ready for **Weapon System Innovation**

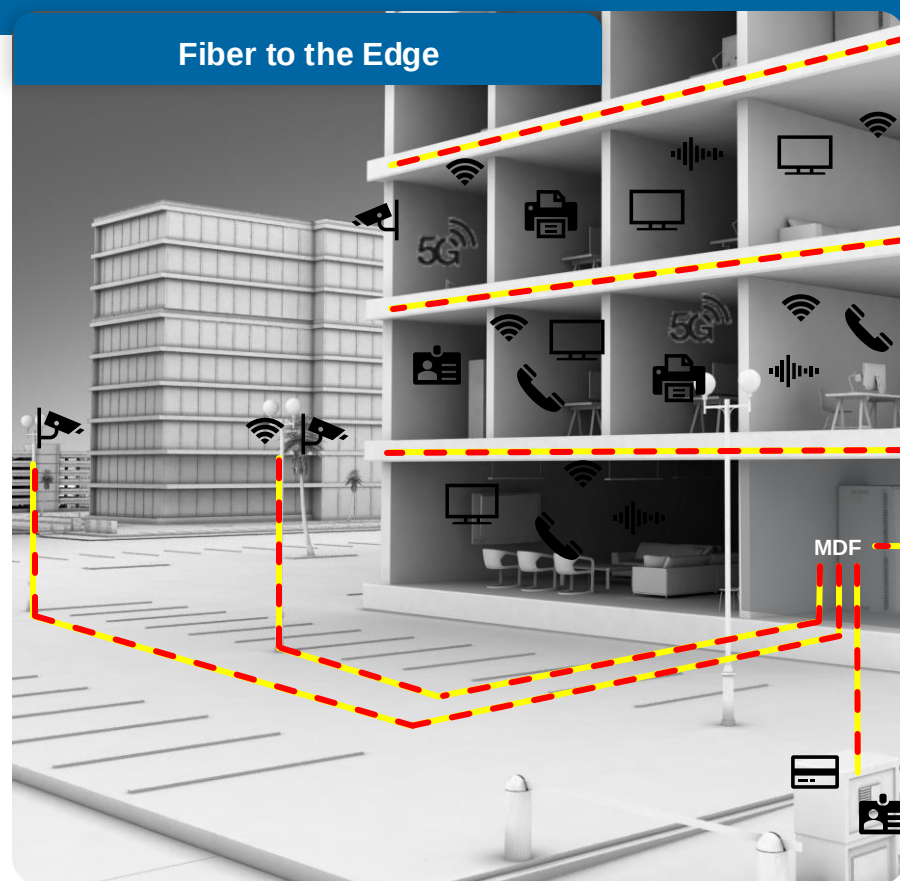
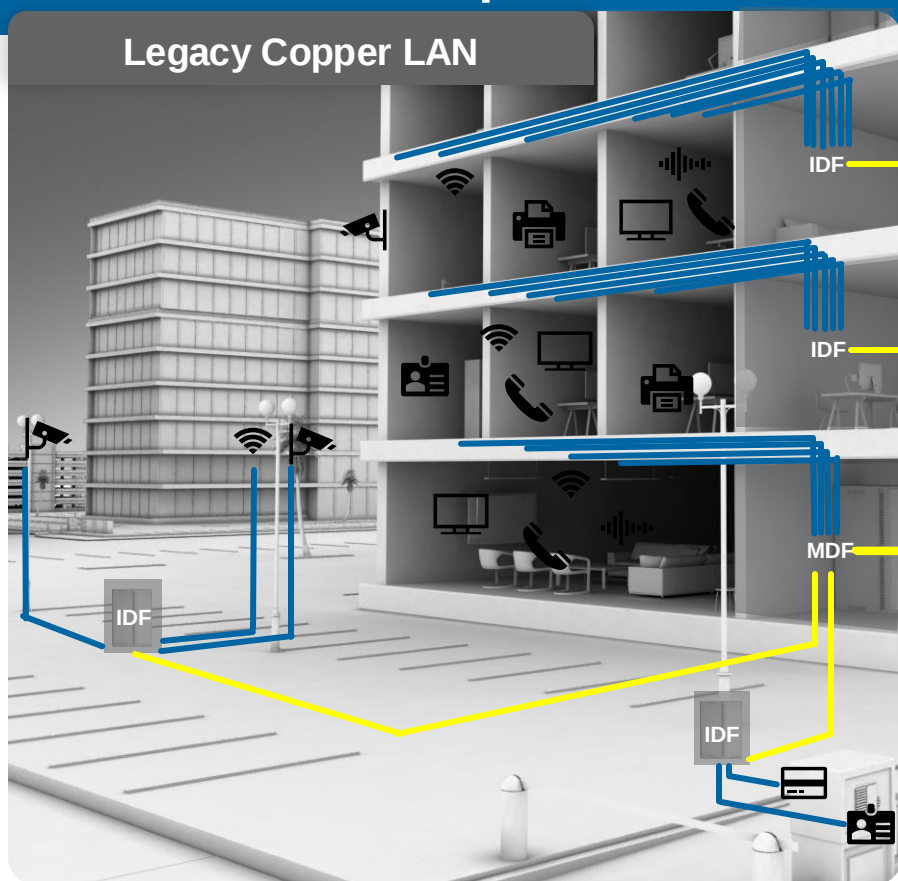


Enabling a Virtual Battlespace

Copper-based cabling has bandwidth and distance limitations



Architecture Comparison





Multiple layers of single-purpose infrastructure



Reduce and eliminate single-purpose infrastructure

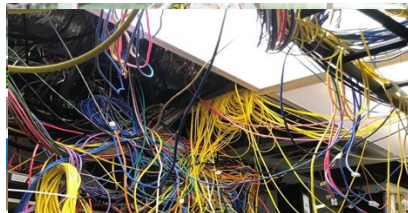
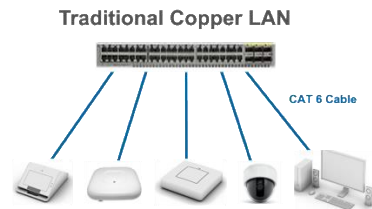


Reduce and eliminate single-purpose infrastructure

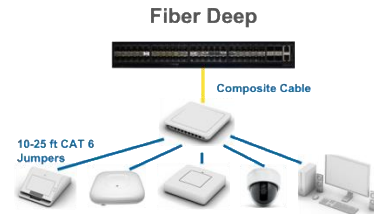
A Revolutionary New Network

Secure, Agile Connection

- **Future network flexibility** with SD-LAN minimizing network disruption
- **Fiber enables a more capable architecture** with longer reach, higher bandwidth and greater flexibility
- **Technology neutral approach** - supports active P2P Ethernet and PON
- **Single-pane-of-glass orchestration** and management of multi-tenant services
- **Network Source of Truth Central** controller/policy, continuously audit network, automatically remediate and alert anomalies
- **Zero trust** extending to the access layer policy to the edge port, 802.1X, authenticate everything



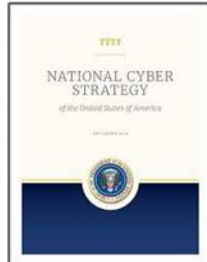
VS.



Fiber/SDLAN connectivity is future-ready for **Network Cyber Defense**

Cyber Missions Need Unlimited **Lines of Communication**

2018 USCYBERCOM Vision: “Facilitate speed and agility for cyberspace operations in policy guidance, decision-making processes, **investments**, and operational concepts.”

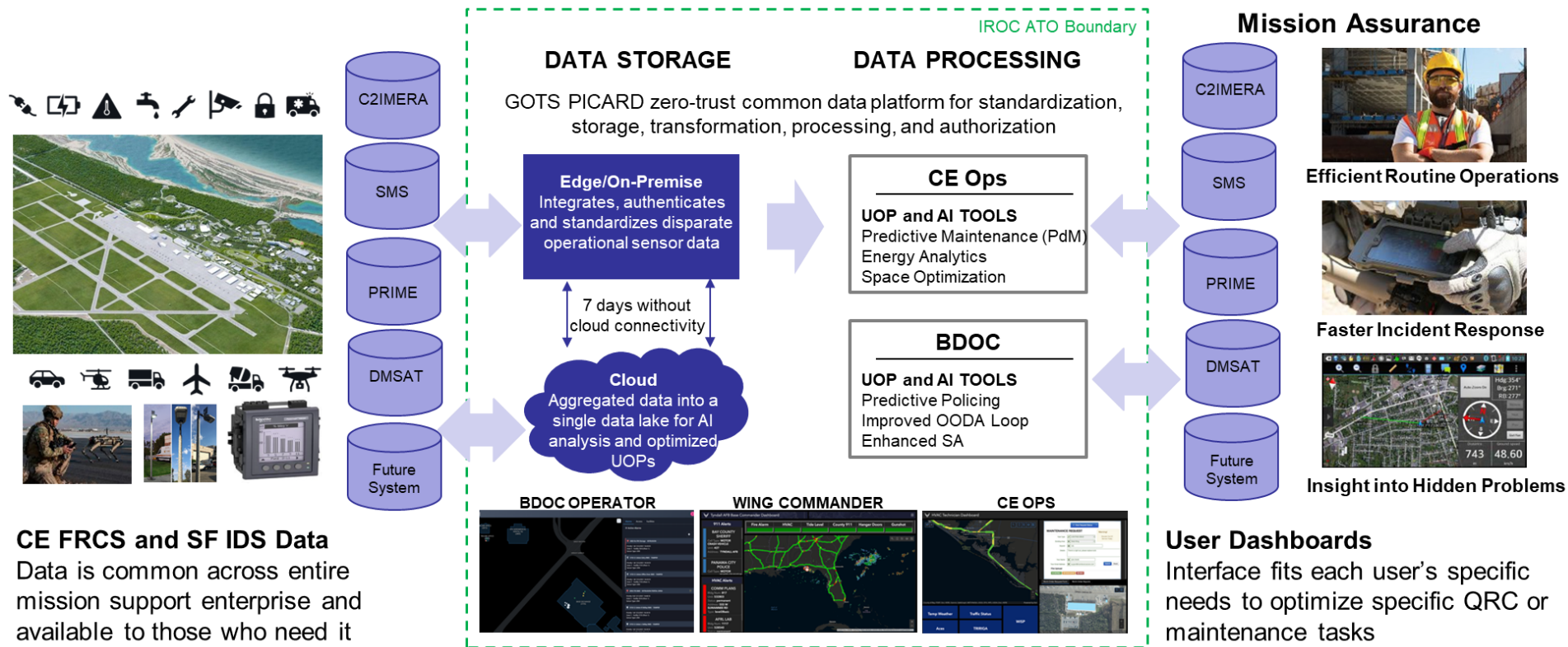


DoD CYBER STRATEGY Investment Goals:

- ✓ Seek material solutions that are affordable, flexible, and robust
- ✓ Leverage COTS capabilities to reduce reliance on expensive, custom-built software that is difficult to maintain/upgrade
- ✓ Strengthen the security and resilience of networks that contribute to current and future U.S. military advantages

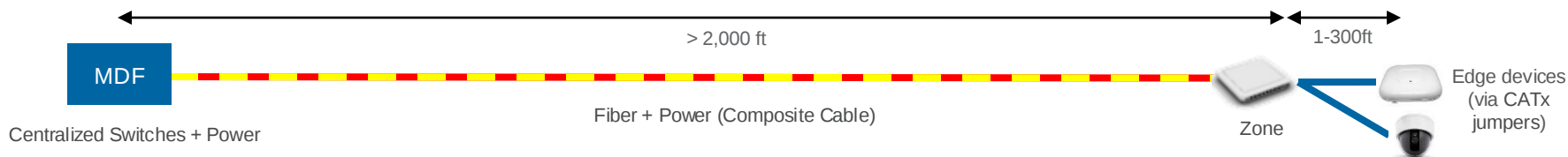
Fiber connectivity future-ready for USAF Installation **Digital Twins**

USAF Installation Resilience Operations Command/Control (IROC)



CE FRCS and SF IDS Data
Data is common across entire mission support enterprise and available to those who need it

Corning Next Gen Data Transport Architecture



White Box Appliances



1G/10G/40G Optical Switching Fabrics
PoE/PoE+/PoE++
Full SFP portfolio

Broad ActiFi Composite Cable Portfolio



Up to 2,000 ft. reach
1-24 F / 2-12 Cu
12-20 AWG
Reel-in-a-Box

Edge Devices – Optical to Ethernet w/ PoE



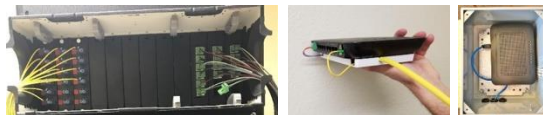
Dual-mode software-defined access nodes
10G HPoE Media Converters

Low Voltage, Intelligent Power Solutions



CIP: 0-800W, redundant, 24V or 56V available
Aggregation; step-down accessories

Compatible Structured Cabling



Fiber/Copper Management

Connectivity & Enclosures

Advanced Software Defined Network Orchestration Software



Proven Technology, New Architecture

Secure, Agile, Affordable Value for all Stakeholders

Mission Owners – Bandwidth Ready for Weapon Systems

- **Unlimited data throughput**– multitudes times additional ports
- **More Secure** – No EM signature
- **Enhanced network monitoring** through network orchestration
- **Unlimited Data scale**– Support for current needs and in the future without the typical expense and disruption of upgrades

Comm/IT – 21st Century Network

- **Future network flexibility** with SD-LAN minimizing network disruption
- **Technology neutral approach** - supports active P2P Ethernet and PON
- **Zero trust** extending to the access layer policy to the edge port, 802.1X, authenticate everything

Installation Engineers – “Future Proofing”

- **Significant cost savings** to install, operate, upgrade
- **Remote power embedded in cable** – no separate A/C power
- **Future capabilities** installed now with a fraction of the servers, cabling, closets - Less runs, less labor, less configuration time
- **Sustainable** - less power/cooling impact
- **Flexibility** in labs, depots, Squadron backshops,

- ✓ **Single-pane-of-glass orchestration** and management of multi-tenant services
- ✓ **Network Visibility** provisioning automation from edge ports to WAN
- ✓ **Network Source of Truth** Central controller/policy, continuous audit, automatic remediate & alert anomalies

JITC Approved

DODIN Approved Product Listing

DoDin APL listed under Assured Services LAN Product Category

Testing is complete!

- End-to-End Corning Everon SD-LAN Platform testing is complete
- Cyber Testing ✓
- Interoperability (IO) Testing ✓
- Initial DODIN APL Listing as AS-LAN November 2023
- Desktop Review Scheduled December 2024
- Additional testing cycle planned under PON Category



USAFA - Madera Cyber Innovation Center

Enabling cadets for tomorrow

Corning is a proud donor of future flexible infrastructure!



"The Madera Cyber Innovation Center positions the Academy as an innovation hub, revolutionizing the employment of cyber and artificial intelligence technologies to ready cadet leaders for the future fight," said Dressler. "The collaboration space will bring academia, industry and military operators together to educate and train the Air and Space Forces' future officers as forward-thinking leaders in advanced technological warfare."

Paul '78 and Joan Madera provided the lead gift for the center, with donors contributing more than \$39 million to the project, including gifts in kind — surpassing the private support goal of \$30 million. Cisco, Siemens and Corning Inc. have donated technology upgrades to the center. Support from donors supplements the \$30 million in funding allocated by the federal government for the construction of the building.

Case Study: Headquarters

Capabilities at Scale

180,000 FT²	TRADITIONAL	FTTE	SAVINGS
MATERIAL	\$972,831	\$739,170	25%
LABOR	\$242,209	\$137,669	43%
TOTAL	\$1,215,040	\$867,839	29%

- 180,000 sq ft
- 800 employees
- Open office environment
- Wi-Fi access points
- 4K HDR A/V conferencing
- In-building cellular
- VoIP soft phones
- Sound masking
- Security cameras
- Printers, workstations

Enabling More

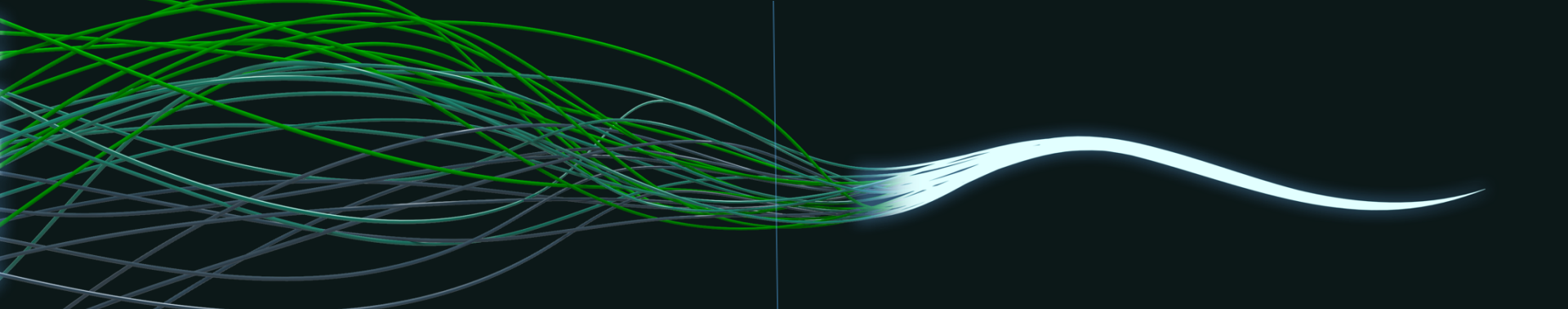
Day 1 Applications:



Smarter Network Design:

- WiFi-first environment
- Extended network reach for outdoor connectivity
- Reduced cable tray by 50%
- Used 70% less linear feet of cable
- Eliminated 80% of TRs, saving \$50k per TR buildout
- Prepared for 5G speeds
- Upgrade from WiFi6 to WiFi7 without adding cables
- Supporting bandwidth-demanding audio/visual needs





Networks are Changing



Overcome institutional resistance to modern network and data transport architectures



Existing fiber technology solves DoD's data tsunami today



Warfighters need fiber optic SD-LAN with composite cables



Stop throwing money at legacy systems

DoD Demands are Increasing



More bandwidth, lower latency are requirements



Enable Installation of the Future - 5G, A/V, WiFi 6, and beyond



Streamline installation network architecture



30% Capex Reduction
50% Less Total Cost of Ownership

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