Use Case: Mission-Critical Connectivity for Defense Command and Control

Securing the Digital Frontline: Lumen's Infrastructure Services for Federal Defense Agencies

Challenges

Mission Readiness Undermined by Infrastructure Gaps

A leading federal defense agency found itself at a critical juncture as it faced mounting pressure to modernize its digital infrastructure. The agency's existing network, while once sufficient, was no longer capable of supporting the demands of real-time threat detection, secure data transport across distributed environments and AI-driven operations. With the rise of artificial intelligence and quantum computing, the agency must be able to process massive data volumes with ultra-low latency to enable rapid, informed decisions.

Strict federal compliance requirements add complexity, demanding a secure, resilient architecture for data in motion and at rest. The agency also required a scalable solution that could support edge computing for field operations and distributed command centers—to help ensure mission-critical systems remain operational under any circumstance.

Without a future-ready infrastructure, the agency risks falling behind in responding to emerging threats and fulfilling its national security mission. This scenario reflects the very real and urgent challenges faced by federal defense and intelligence agencies today.

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Challenges

- Enable AI-driven decision-making at the edge
- Process sensor and satellite data in real-time with sub–5ms latency
- Meet stringent compliance mandates
- Future-proof the infrastructure for evolving mission needs including quantum computing and next-gen cryptography

Results

- Operational readiness
- Scalability and Resilience
- Compliance and Security
- Future-Ready Infrastructure

Solution

Purpose-Built Infrastructure for Mission Success

To meet the demands of this mission-critical environment, this agency could collaborate with Lumen to design a secure, high-performance infrastructure tailored to the unique needs of defense operations. This solution could be built with Lumen Private Connectivity Fabric (PCF), Dark Fiber, and Wavelength Services—technologies engineered for speed, security, and scale.

At the core of the deployment a custom-built network architecture could provide:

- Dedicated, encrypted pathways for data in motion and at rest help ensure compliance with federal mandates.

LUMEN® TECHNOLOGIES

- Low latency, enabling real-time AI inferencing and rapid processing of sensor and satellite data.
- Edge compute nodes are strategically placed to support distributed command centers and field operations, help reduce reliance on centralized infrastructure and improve response times.
- Quantum-resilient transport to future-proof the network against emerging threats and evolving mission requirements.

In addition, Lumen managed services team could work hand-in-hand with the agency's IT and security leaders to help ensure seamless integration with existing systems, while also laying the groundwork for scalable expansion as operational needs evolved.

Outcome

Infrastructure That Delivers Strategic Advantage

The results could be transformative. With Lumen infrastructure services in place, a federal defense agency could experience:

Operational agility: Real-time threat detection and AI-driven decision-making can become a reality, maximizing mission readiness.

Resilience and scalability: The new infrastructure would support high-throughput AI and quantum workloads, with the flexibility to adapt to future technologies and mission demands.

Security and compliance: Sensitive data can be protected across all environments—edge, core, and cloud—meeting the highest federal security standards.

Future-ready architecture: With Lumen's ongoing investments in fiber density, photonics innovation, and edge computing, an agency can be positioned to lead in the next generation of defense technology.

This scenario illustrates how federal defenseagencies can overcome legacy limitations and embrace a secure, AI-ready future with the right infrastructure partner

Results and the future

Infrastructure That Powers Tomorrow's Missions

By collaborating with Lumen, agencies won't just upgrade their infrastructure—but can redefine their operational future.

With secure, low-latency connectivity and purpose-built architecture supporting AI and quantum workloads, any federal agency can gain the agility to respond to threats in real time, the scalability to meet evolving mission demands, and the confidence that its infrastructure is ready for what's next.

A transformation such as this would lay the foundation for a more connected, intelligent, and resilient defense posture—one built not just for today's challenges, but for tomorrow's possibilities.

Lumen Solution Set

Lumen® Private Connectivity Fabric SM(PCF)
Lumen® Dark Fiber
Lumen® Wavelengths
Edge Compute Nodes

LUMEN® TECHNOLOGIES