Backbone for AI – Infrastructure Architecture

Infrastructure Services CSA – Technical Marketing

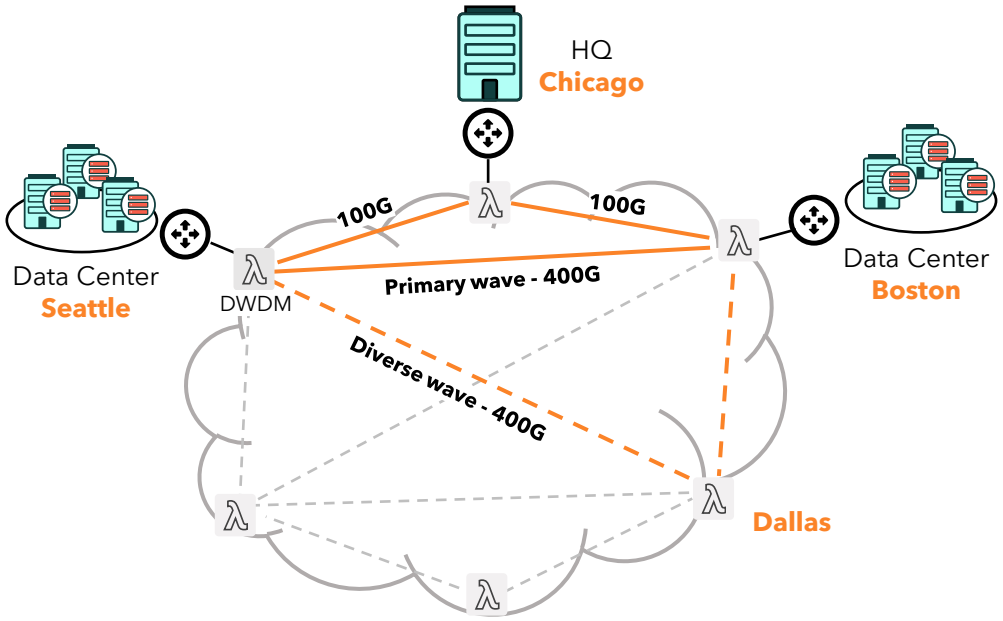
LUMEN®

Backbone for AI – Top segments

Segment	Business Challenge/Opportunity	Lumen Solution
1. Large Enterprise (LE)	• Legacy connectivity infrastructure, need to modernize • Adopting new AI applications, datacenter(DC) expansion • Strict governance in Healthcare & Finance: HIPAA and PCI • Complexity in monitoring and assurance of network • Need for a high-capacity, resilient private connectivity with monitoring	• Wavelengths (100G/400G): Unprotected, Protected & Diverse • Rapid routes for quick time to market, industry leading 20day SLA* • Encryption available for enhanced security • Largest ultra-low-loss intercity fiber network in NA • Ranked #1 in Wavelengths service in NA (Frost Radar)
2. Datacenter operator (DCO)	• DCOs racing to build out new locations • According to McKinsey, global demand for DC capacity could more than triple by 2030, US growth rate is 20–25% per year • With increasing AI workloads, need for high-capacity resilient DC connectivity • Proximity to enterprise data traffic routes and on-ramps into other cloud providers, Interconnection complexity	• Wavelengths and Dark Fiber provide the dedicated resilient connectivity. • Extensive Lumen network across 70+ US Markets • Wavelengths suited for long haul DC interconnects • Dark Fiber cost efficient for metro connectivity • Extensive on-ramps into cloud providers. Plan to reach 98% coverage in 2026, all with 400G capacity
3. Neocloud	• Emergence of Neoclouds offering GPUs (Anthropic, CoreWeave, etc.) • New class of AI datacenters • Heavy investments in infrastructure (CoreWeave $6B) • AI Training requires large datasets (petabytes) – cost & time • AI inferencing in near real-time requires low latency, network latency of 10–40ms (round trip delay, TTFT – time to first token) • Need for deterministic, ultra-high-capacity transport that delivers predictable latency and performance	• Combination of Wavelengths and Dark Fiber • Wavelengths for rapid deployment, flexibility and scalability • Dark Fiber offers full control, managed offering through MOFN, longer deployment times and contract terms • Enterprise access to Neo Cloud through On-ramps/carrier hotel • Largest ultra-low-loss intercity fiber network in NA, extensive on-ramps

Segment 1: Large Enterprise

LE | DCO | Neo



Unprotected 100G Waves
Primary route – From Seattle to Boston
Diverse path – Through Dallas

Primary wave
Diverse wave

Customer example: Health Insurance provider
25 x 100G unprotected, encrypted wavelengths (diverse pairs)
11 x 10G encrypted waves (some unprotected and diverse, some protected)

Business Challenge

- Legacy connectivity infrastructure, need to modernize
- Adopting new AI applications, Datacenter expansion
- Strict governance in Healthcare & Finance: HIPAA and PCI
- Complexity in monitoring and assurance of data in the network
- Need for a high-capacity, private connectivity with monitoring

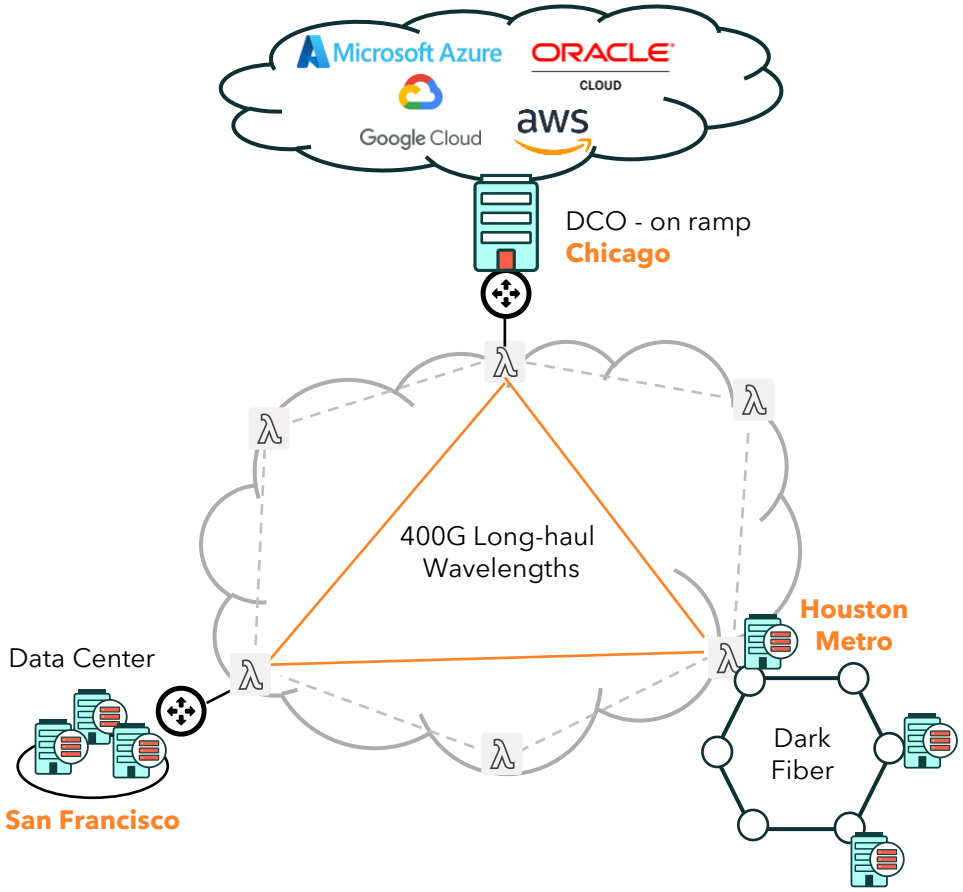
Lumen Solution

- Wavelengths (100G/400G), different architectures
  - Unprotected: single wave (availability of 99.45%)
  - Protected: primary + failover (availability of 99.99%)
  - Diverse: primary + diverse wave (geographically separate) [Dual Diverse : multiple gateways a city]
- Rapid routes for quick time to market, industry leading 20-day SLA*
- Encryption available for enhanced security
- Largest ultra-low-loss intercity fiber network in NA
- Ranked #1 in Wavelengths service in NA (Frost Radar)

*Based on publicly available SLAs and service installation data for major U.S. wavelength providers, and market share data from the July 2024 Atlantic-ACM North American Business Connectivity Survey SLAs may vary by provider, location, and contract terms

Segment 2: Data center operator (DCO)

LE | DCO | Neo



Customer example: Tier1 Datacenter Operator
100/400G Wavelengths backbone for management connectivity between sites, also used for security video and mission critical data

Business Challenge/Opportunity

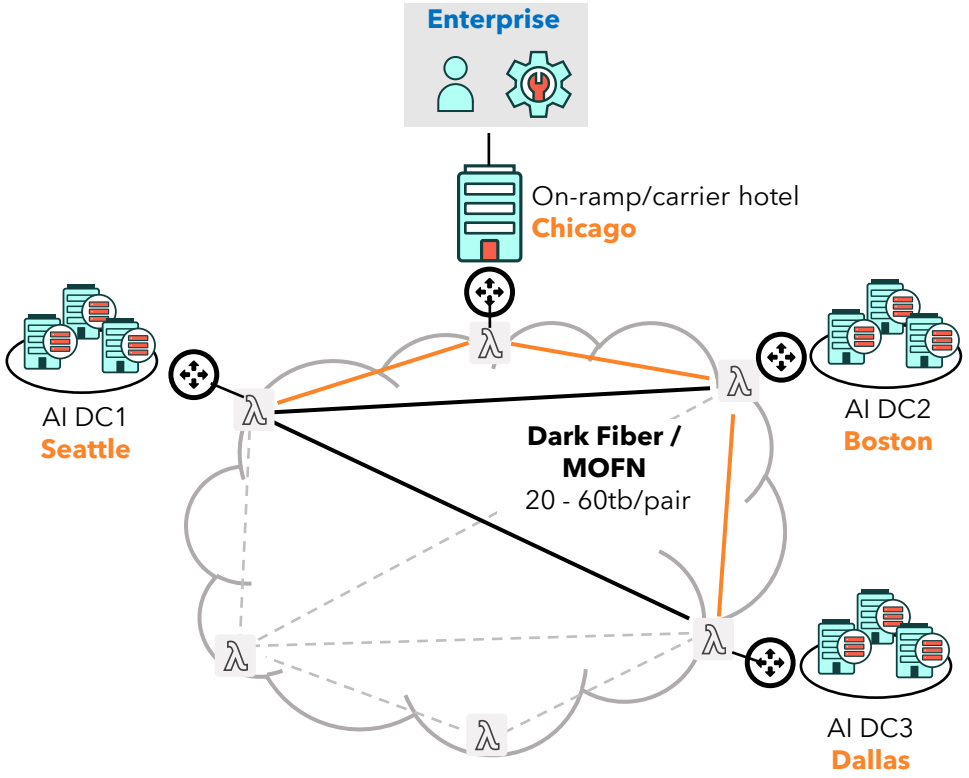
- DCOs racing to build out new locations
- According to McKinsey, global demand for DC capacity could more than triple by 2030, US growth rate is 20–25% per year
- With increasing AI workloads, need for high-capacity resilient DC connectivity
- Proximity to power, enterprise data traffic routes and on-ramps into other cloud providers, Interconnection complexity

Lumen Solution

- Wavelengths and Dark Fiber provide the dedicated resilient connectivity.
- Extensive Lumen network across 70+ US Markets
- At 100/400G, Wavelengths suited for long haul DC interconnects
- Dark Fiber an option for metro connectivity
- Extensive on-ramps into cloud providers. Plan to reach 98% coverage in 2026, all with 400G capacity

Segment 3: Neoclouds

LE | DCO | **Neo**



Dark Fiber between NeoCloud DCs to enable PB/TB data transfer
400 G Waves connecting NeoCloud to Colo/Carrier Hotels

Dark Fiber
400G Wave

Customer example: Large Neocloud model provider
Dark fiber network in 37 markets with 375K fiber miles and over 400 ILAs enabling provider to scale a day one network at 400Tb (12pairs*40tb).

Business Challenge

- Emergence of Neoclouds offering GPUs (Anthropic, CoreWeave, etc.)
- New class of AI datacenters
- Heavy investments in infrastructure (CoreWeave $6B)
- AI Training requires large datasets (petabytes) – cost & time
- AI inferencing in near real-time requires low latency, network latency of 10–40ms (round trip delay, TTFT – time to first token)
- Need for deterministic, ultra-high-capacity transport that delivers predictable latency and performance

Lumen Solution

- Combination of Wavelengths and Dark Fiber
- Wavelengths for rapid deployment, flexibility and scalability
- Dark Fiber offers full control, managed offering through MOFN, longer deployment times and contract terms
- Enterprise access to Neo Cloud through on-ramps/carrier hotel
- Largest ultra-low-loss intercity fiber network in NA, extensive on-ramps

Network Infrastructure Architecture