

Wavelength Services

Spectrum Business Wavelength Services are optical transport services intended to support customer-managed networking architectures that require dedicated physical-layer connectivity between locations. The service provides optical transport capacity only and does not include packet routing, switching, traffic management, encryption or application-layer functionality.

Wavelength Services are designed for scenarios in which customers retain responsibility for all higher-layer networking functions, including protocol selection, routing design, protection mechanisms and security controls. Spectrum Business provides the underlying optical transport facilities and associated operations within the defined service demarcation.

Network

Wavelength Services are Layer 1, point-to-point optical transport services delivered over Spectrum Business metro and regional fiber transport networks using Dense Wavelength Division Multiplexing (DWDM) and Optical Transport Networking (OTN). Each Wavelength circuit provides a dedicated optical channel between two endpoints, which may be customer Premises, Spectrum Business Points of Presence (POPs) or a combination thereof.

The service is provisioned as a non-packet-switched optical path. Packet forwarding, buffering, and statistical multiplexing are not performed within the transport layer. The optical path remains transparent to client protocols and provides continuous access to the provisioned line rate for the ordered circuit.

Wavelength Services are available in locations served by Spectrum Business DWDM transport infrastructure. Service availability, routing options and diversity are subject to network feasibility and engineering review.

Service demarcation

The service demarcation point for Wavelength Services is the Layer 1 optical interface on Spectrum Business equipment located at the customer premise or POP.

The customer is responsible for:

- Providing compatible optical cross-connects between customer equipment and the Spectrum Business demarcation interface.
- Managing and configuring all customer-owned equipment.
- Managing all LAN, WAN, routing, security, encryption and higher-layer services.

Spectrum Business is responsible for:

- Provisioning and maintaining the optical transport path up to the demarcation interface.
- Operating and maintaining the Spectrum Business optical transport network.

Bandwidth and interfaces

Standard Wavelength Service bandwidth options are:

- 10 Gbps
- 100 Gbps
- 400 Gbps

Wavelength Services at 1 Gbps are not offered. Customers requiring 1 Gbps connectivity should use Spectrum Business Ethernet services.

Supported client signal types transported over OTN include:

- 10G Ethernet LAN PHY
- 10G Ethernet WAN PHY
- OTU2

Customer handoffs are provided using optical interfaces that match the ordered bandwidth and signal type. Customers are responsible for ensuring that their equipment supports the required optical specifications, reach characteristics and interface standards.

Signaling and transport

Wavelength Services use Optical Transport Networking (OTN) in accordance with ITU-T Recommendation G.709 to transport client signals transparently across the Spectrum Business optical network. Client protocol headers are preserved end-to-end and are not modified by the transport layer.

Forward Error Correction (FEC) is applied to improve optical signal performance and transmission reach. DWDM is used for wavelengths traversing reconfigurable optical add-drop multiplexer (ROADM) network segments. Passive multiplexing and demultiplexing may be used within access segments where required.

Service configurations

Wavelength Services may be provisioned as a single, unprotected optical circuit between two endpoints.

Where required, customers may order additional Wavelength circuits engineered with physical path diversity to support redundancy or resiliency objectives. Physical diversity options are subject to network availability and engineering feasibility.

Supported service configurations include, but are not limited to:

- Customer Premise to Customer Premise
- Customer Premise to POP
- POP to POP (where available)

Spectrum Business does not perform transport-layer protection switching for Wavelength circuits.

Protection and redundancy

Customers are responsible for implementing any required protection, failover, or restoration mechanisms using customer-owned equipment or higher-layer network designs. This may include optical-layer protection, routing-based failover or application-level redundancy.

Each circuit operates as an independent optical path.

Spectrum Business provides options for diversity and route protection. Where diverse circuits are ordered, Spectrum Business will engineer physical path diversity based on available facilities and documented route options.

Encryption

Spectrum Business Wavelength Services do not include provider-managed encryption and do not perform inline encryption at the optical layer.

Customers may implement encryption using customer-managed equipment and technologies at Layer 2, Layer 3 or higher layers as required to meet security, regulatory, or compliance requirements. Encryption design, implementation and key management remain the responsibility of the customer.

Customer Premise Equipment (CPE) requirements

Customer Premise Equipment used with Wavelength Services must meet the following minimum requirements:

For 100 Gbps and higher bandwidth services:

- Dual power feeds (A/B)
- Redundant controllers or line cards

For 10 Gbps services:

- Dual power feeds (A/B)
- Single controllers may be used where dual controllers are not supported

Customer equipment must support management and monitoring via the Generic Communications Channel (GCC) defined in ITU-T G.709 or via another management method agreed upon during service provisioning. Optical interfaces must comply with the specifications required for the ordered Wavelength service.

Network monitoring and operations

Spectrum Business monitors Wavelength circuits using optical and transport network management systems. Monitoring includes fault detection, alarm generation and performance indicators related to the optical transport layer.

Spectrum Business is responsible for maintaining the optical transport infrastructure within the service boundary. Customers are responsible for monitoring and maintaining customer-owned equipment and all higher-layer services.

Service-level agreement

Wavelength Services is supported by a Service-Level Agreement (SLA) as specified in the applicable Spectrum Business Wavelength Services SLA document.

SLA terms, metrics, thresholds and remedies are defined separately and are not described within this technical specification.

Wavelength performance characteristics

Wavelength Services operate at the physical (Layer 1) level of the OSI model and provide a dedicated photonic transport path over fiber infrastructure. Unlike shared Layer 2 or Layer 3 services, performance characteristics are determined by optical path design and physical-layer behavior rather than packet processing.

General performance characteristics include fixed optical latency, dedicated bandwidth and protocol transparency.