


# Multiservice Metro Optical Transport



The Cisco ONS 15454 is the industry's leading metro optical transport platform with more than 600 customers and 30,000 systems deployed. The Cisco ONS 15454 combines supercharged SONET/SDH transport, integrated optical networking (including ITU Grid Wavelengths and DWDM) and unprecedented multiservice interfaces (including Ethernet, ATM, and TDM) to deliver radical economic benefits to service providers. The Cisco ONS 15454 offers the functionality of multiple network elements including SONET/SDH multiplexing, DWDM, TDM, ATM, Ethernet bandwidth management, and seamless scaling to 10-Gbps transport. About the size of a microwave oven, the Cisco ONS 15454 offers unrivaled capacity and flexibility in a tiny footprint.

The Cisco ONS 15454 is engineered on the principle that fundamental changes are taking place in metro networks. Next-generation transport designs are required to address high-speed data and its inherent differences from traditional voice networks. Cisco stands alone in the metro optical transport industry with a platform that provides both TDM and statistical multiplexing on the same platform. This enables service providers to cost effectively deliver high-bandwidth data services such as Gigabit Ethernet on the same physical fiber facility with traditional DS1 and DS3 traffic while managing this traffic down to the DS1 or packet level.

## Multiservice Metro Optical Transport for New Network Builds

The Cisco ONS 15454 is not a traditional SONET network element. It is a revolutionary metro optical transport platform that integrates 3/1 and 3/3 cross-connect functionality with SONET/SDH transport, DWDM, and high-speed data interfaces, aggregation, and switching. The Cisco solution addresses the needs of networks today and provides bandwidth and interface flexibility for the future. Unlike traditional SONET devices, the Cisco ONS 15454 integrates SONET transport features and bandwidth management into a common platform. In addition to managing bandwidth via traditional TDM for DS1 and DS3 circuits, the Cisco ONS 15454 also integrates statistical multiplexing to better utilize each VT1.5 and STS-1 in a data-intensive SONET network. The integration of a SONET plane and a data plane allows the Cisco ONS 15454 to act as a SONET transport system, digital cross connect, and data switch out of the same shelf. The Cisco ONS 15454 architecture also maximizes the revenue generating capabilities of a SONET network by managing bursty data traffic from next generation integrated access devices on the customer premises.

The Cisco ONS 15454 architecture is optimized specifically to help service providers in the following ways:

- Supercharging SONET transport—Integrates the capabilities of OC-3, OC-12, OC-48, and OC-192 SONET multiplexers onto a single platform, with upgrades as simple as a card change.



- Integrated optical networking—Provides scalable SONET transport, ITU grid wavelengths, DWDM, and optical services in the same small platform.
- Unprecedented multiservice interfaces—Supporting TDM, Ethernet, ATM, and video services allows service providers to offer advanced services such as transparent LAN, virtual LAN (VLAN), and ATM quality of service (QoS). The Cisco ONS 15454 also supports additional customer services such as bandwidth utilization reports, software-configured "bandwidth on demand," and others associated with high-speed data services.
- Maximizing the network—Integrating 3/1 DCS functionality on the same shelf with OC-N transport and high-speed data interfaces. OC-N business rings can home to the same shelf, supporting the inter-office ring networks for efficient transport of access traffic within and across the metro optical transport network.
- Radical economics—Establishing a new paradigm regarding the economics surrounding metro optical transport and management, Cisco enables service providers to deploy more SONET fiber networks with the same capital budgets. In addition, the Cisco ONS 15454 offers the lowest life cost. Integrating the functionality of three or four legacy network elements into one common platform saves significant capital, which can be used to open new revenue-generating markets.

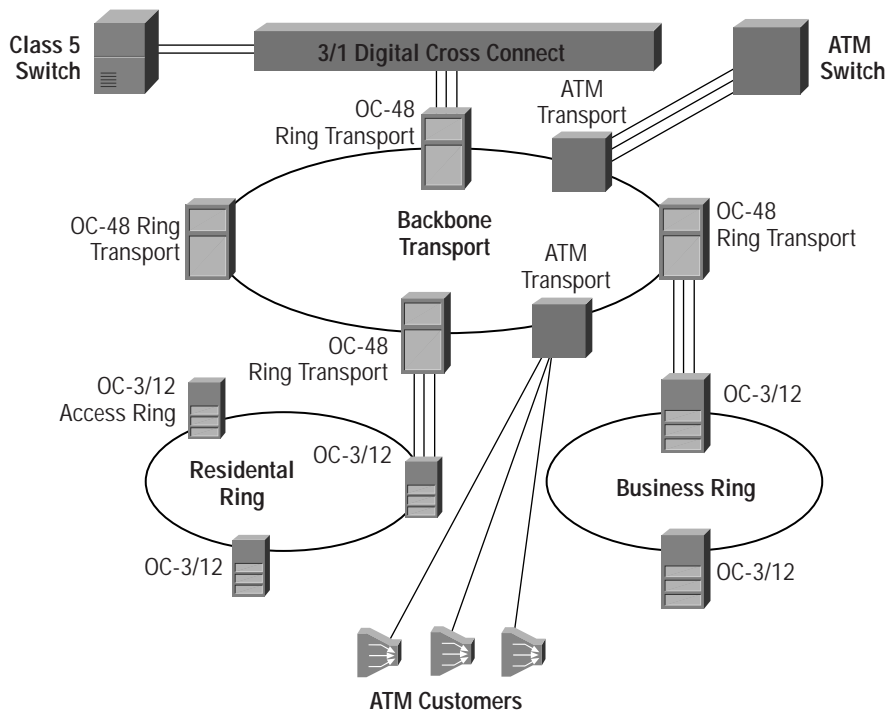
### Supercharged Metro Optical Networks—Before and After

Cisco enables service providers to significantly reduce the number of elements in their next-generation network by integrating optical transport, bandwidth management, and data interfaces into a single hardware platform. Service providers are entering a significant number of commercial markets, and the use of Cisco technology dramatically increases the efficiency of these new networks. The Cisco ONS 15454 offers the most flexible metro optical transport platform available today with the most service interfaces. In essence, Cisco enables service providers to generate at least four times the revenue from the same capital investment by utilizing Cisco statistical multiplexing technology.

Figure 1 depicts a traditional transport and feeder network. The network elements contained in this illustration represent one vendor technology for OC-48 backbone transport, a second vendor technology for residential distribution, possibly a third technology for Ethernet and data business distribution, a fourth vendor for 3/1 digital cross connect support, and a fifth technology for ATM customers. In addition, the ATM traffic is usually riding a separate set of fibers that is being significantly underutilized. The Cisco ONS 15454 is extremely competitive used simply as a replacement for OC-48 backbone applications. However, it is necessary to view Figure 2 to experience the radical economic benefits that the Cisco ONS 15454 brings to the next-generation network.



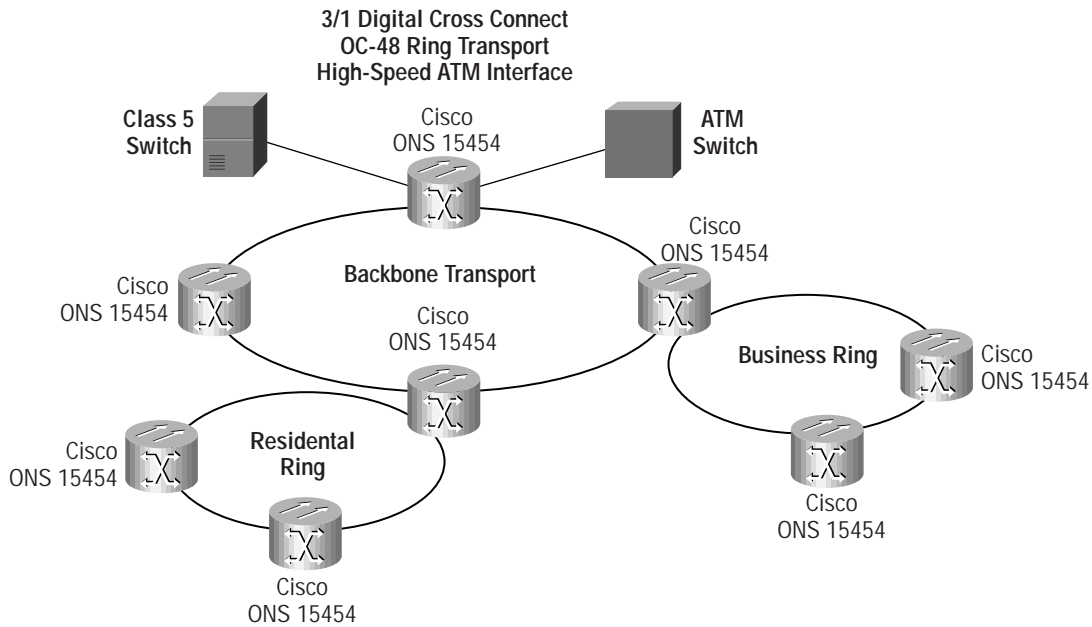
Figure 1 Traditional Transport and Feeder Network



As Figure 2 illustrates, the Cisco ONS 15454 provides the capability to integrate backbone and access SONET rings onto the transport management platform, and also support the functionality of a traditional 3/1 DCS platform. Not only does the technology provide for the integration of three technologies into one, but also the simplicity of the Cisco ONS 15454 design allows this to be accomplished with just eight different card types.

In addition, the Cisco ONS 15454 platform supports high-speed data interfaces, which allows the service provider to collapse the TDM and data traffic onto the same fiber pairs. The aggregation capabilities of the Cisco ONS 15454 will save on the cost of port cards in the switch by providing one high-speed interface back to the ATM core switch as opposed to dedicated low speed interfaces for each Digital Subscriber Line Access Multiplexer (DSLAM) network element in the network.

Figure 2 The Cisco ONS 15454 Advantage: Multiservice Metro Optical Transport Network



### Cisco ONS 15454 Features

The Cisco ONS 15454 aggregates multiple traffic types and transports traffic on a scalable optical backbone. The list below highlights several features that the Cisco ONS 15454 provides to aggregate multiple types of traffic:

- High DS1 port count
- High DS3 port count
- DS3 transmux capability
- Scalability from OC-3 to OC-192
- Two- and four- fiber BLSR support
- Support of subtending rings from OCn platform
- 3/3 and 3/1 on board digital cross-connect capabilities
- Native support for multiple types of services
- Ethernet and Fast Ethernet
- Gigabit Ethernet

### Maximum Services with the Lowest First and Life Cost

The Cisco ONS 15454 supercharges metro optical transport by offering scalable SONET and integrated optical networking for capacity expansion and by providing multiservice traffic aggregation and switching on the same small platform. These features, all integrated into a small chassis, deliver the maximum services with the lowest first and life cost in the industry. Part of the unrivaled Cisco IP+Optical product line, the Cisco ONS 15454 combines the intelligence of IP services with the unlimited capacity of optical transport to deliver radical economic benefits to service providers.



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