



IntelliLight® Optical Transport  
Service  
Product Guide (Product Guide)

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## INTELLILIGHT® OPTICAL TRANSPORT SERVICE

### I. GENERAL

#### A. Service Overview

1. IntelliLight® Optical Transport Service (**IOTS** or the **Service**) provides managed optical transport of multiple protocols that are transmitted over a single fiber optic pair. IOTS is configured in a diversely routed ring architecture or topology. The ring architecture allows for point-to-point optical services of varying wavelengths to be multiplexed on or off of the ring.
2. IOTS allows for the native transmission of multiple high-speed protocols of various wavelengths over a single customized network. The wavelengths are arranged in a channelized format such that the protocol transmitted over each channel is independent of every other channel on the IOTS ring. The Customer must specify, by channel, the interface that defines the transmission speed and protocol being transmitted over the associated wavelength.
3. IOTS networks are provisioned as a single ring architecture. Customer designated Premises and Central Office (**CO**) locations may be provisioned as Nodes on the IOTS network. CO locations may also be provisioned as Mid-Span Amplifier locations. Mid-Span Amplifiers do not have add/drop capability.
4. The Customer is responsible to ensure that its facilities and equipment comply with any applicable technical requirements or limitations for the protocol being transmitted over the Optical Transport Channels. Verizon will retain control of the design and configuration of the IOTS ring. Construction of the ring will not begin until the overall design and configuration of the IOTS ring are mutually agreeable to both the Customer and Verizon.
5. The Service provides a high-speed, diversely routed topology for a variety of purposes including Asynchronous Transfer Mode, Mainframe, and interconnectivity of high-speed Internet Protocol (IP) routers. An optical signal carrying multiple wavelengths provides the connection between IOTS Nodes in a dedicated ring configuration. Customers interface with the IOTS at OC3/3c, OC12/12c, OC48/48c, OC192/192c, ESCON, 1Gbps and 2Gbps FICON, 1Gbps and 2Gbps Fibre Channel, ETR, FDDI, ISC, ISC3, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, and D1 Video.

#### B. Acronyms and Definitions

Central Office (CO): a Verizon office or building in which local loops serving a Customer designated Premises in a locality are connected to each other or to a Verizon optical network at such office or building.

Connecting Facility Assignment (CFA): the identification of a channel or circuit to be used from a high capacity facility.

**Host Customer:** a Customer of Verizon who enters into a voluntary SNA with a Service User for the purpose of connecting the Service User's lower capacity service provided by Verizon to Service User to the Host Customer's IOTS Service.

**Optical Carrier Rate (OCn):** a SONET transmission signal/speed, line rate, or service. The rates are in multiples of an OC1, which is equivalent to an STS1 (51.84 Mbps), SONET's basic rate.

<u>OCn Rate</u>	<u>Bandwidth Capacity</u>
OC3	155.52 Mbps
OC12	622.08 Mbps
OC48	2.488 Gbps
OC192	9.953 Gbps

**Optical Carrier Rate Concatenated (OC#c):** a "clear channel" SONET transmission using only one framing format. For example, an OC3 signal provides three STS1 frame formats with 3 overheads for a total capacity of 2,268 bytes per SPE frame in an OC3c signal. In an OC3c signal, one STS3c frame format is used with one overhead, increasing the total payload capacity to 2,340 bytes per SPE frame.

**Point of Termination:** the point of demarcation within the Customer designated Premises at which Verizon's responsibility for the provision of Service ends.

**Premises:** a building, a portion of a building in a multi-tenant building, or buildings on continuous property (except Railroad Right-of-Way, etc.) not separated by a public highway. Premises does not include collocation arrangements.

**Service Date:** the date that a service has been installed, tested and made available to the Customer. A confirmed ASR is required to establish a Service Date.

**Service User:** a Customer of Verizon who enters into a voluntary SNA that is not the Host Customer.

**Shared Network Arrangement (SNA):** a service offering whereby a Service User may connect subtending services to a Host Customer's service, and Verizon will undertake to maintain separate Customer records and billing.

**Synchronous Optical Network (SONET):** the North American standard for the transmission of high capacity bandwidth over optical facilities. This synchronous transmission platform utilizes a modular multiplexing approach. Because of the large bandwidth, some of the payload is used to monitor, protect, manage and improve the transmission of the signal.

ANSI - American National Standards Institute  
CDL – Customer designated location  
CO - Central Office  
CLO - Control Link Oscillator  
CSM - Customer Service Management  
DDS - DIGIPATH Digital Service  
DSR - Verizon Dedicated SONET Ring Service  
DTM - Direct TL1 Monitoring

DWDM - Dense Wave Division Multiplexing  
ESCON - Enterprise Service CONnection  
ETC - Exchange Telephone Company  
ETR - External Timing Reference  
FDDI - Fiber Distributed Data Interface  
FICON - Fibre CONnection  
Gbps - Gigabits Per Second  
IBT - IntelliLight® Broadband Transport  
ICB - Individual Case Basis  
IP - Internet Protocol  
ISC - Intersystem Channel  
ITU - International Telecommunications Union  
IXC - Interexchange Carrier  
km - Kilometers  
LAN - Local Area Network  
Mbps - Megabits Per Second  
MPIC - Multi-port Channel  
MUX - Multiplexing  
OC - Optical Carrier  
POP - Point of Presence  
SONET - Synchronous Optical NETwork  
SWC - Serving Wire Center  
TISC - Time In Service Credit  
WAN - Wide Area Network

## II. SERVICE COMPONENTS

### A. Components

Service components for IOTS consist of Nodes, Ring Mileage, Mid-Span Amplifiers, Optical Transport Channels, and network management methods.

#### 1. Nodes

**Nodes** are DWDM network elements located at Customer designated Premises or COs from which Optical Transport Channels are multiplexed on or off of the IOTS ring. The number of Optical Transport Channels required at a location will determine the type of Node that is deployed at each location. For example a location that requires five protected Gigabit Ethernet circuits would require a 16-channel Node to be provisioned. When two Nodes are located in the same building, there will be no diversity between the two Nodes.

##### a. 4-Channel Nodes

1. Placement of a 4-channel Node at a location enables up to four (4) protected Optical Transport Channels to be deployed. Each protected optical channel may be replaced by two unprotected optical channels up to a maximum of eight (8) possible channels on the Node. A 4-channel Node may be utilized as the primary Node at a location or as an expansion Node to expand the capacity of a 16-channel primary Node to create the ability to drop twenty (20)

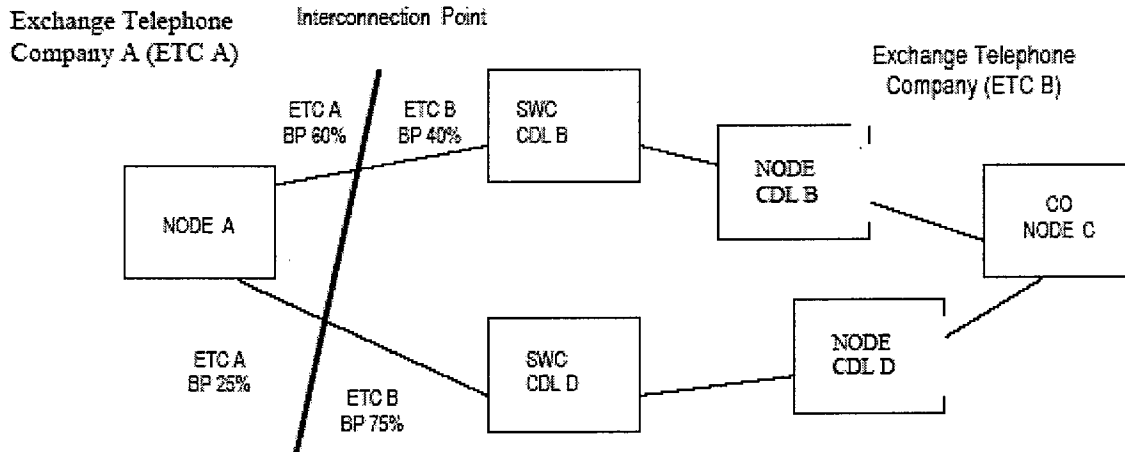
protected Optical Transport Channels. Locations with a 16-channel primary Node and a 4-channel expansion Node have the ability to drop twenty (20) protected or forty (40) unprotected Optical Transport Channels. No more than one (1) 4-channel Node will be provided at a location.

b. 16-Channel Nodes

1. Placement of a 16-channel primary Node at a location enables up to sixteen (16) protected Optical Transport Channels to be deployed. Each protected optical channel may be replaced by two unprotected optical channels up to a maximum of thirty-two (32) possible channels on the primary Node. A 16-channel expansion Node may be added to a 16-channel primary Node to enable up to thirty-two (32) protected Optical Transport Channels (i.e., sixteen (16) on the primary Node and sixteen (16) on the expansion Node) at a single location. Each protected optical channel may be replaced by two (2) unprotected optical channels up to a maximum of sixty-four (64) possible channels at that location.

2. Ring Mileage

- a. **Ring Mileage** is the total of airline distances between devices (Nodes and Mid-Span Amplifiers) rounded up to the nearest mile. For example, the mileage charge for a five device ring and a distance of 4.3 miles between each device (21.5 total miles) would be calculated by multiplying the mileage rate by 22 miles. The mileage between devices (e.g., a primary Node and an expansion Node or an At-Node Amplifier, as applicable) located at the same Customer designated Premises or Central Office is zero. The mileage calculation is based on total ring capacity and not on individual services between devices.
- b. For IOTS offered in the West Operating Territories as specified in Section (IV) following where the ring is provided between the operating territories of two or more telephone companies, IOTS Ring Mileage is determined using the following methodology.



**Step 1** – Calculate the total Ring Mileage by summing the mileage connecting all locations and devices (Node A to SWC CDL B) + (SWC CDL B to Node CDL B) + (Node CDL B to CO Node C) + (CO Node C to Node CDL D) + (Node CDL D to SWC CDL D) + (SWC CDL D to Node A), If the total Ring Mileage includes a fraction of a mile, the value is rounded up to the next full mile.

**Step 2** – Determine the Verizon (ETCB) portion of the total Ring Mileage by first multiplying the mileage between Node A and the SWC of CDL B by the billing percentage (BP) for ETCB (40%) and between the SWC CDL D and Node A by the BP for ETCB (75%) and adding these adjusted mileage segments to the remaining mileage segments on the ring (SWC CDL B to Node CDL B) + (Node CDL B to CO Node C) + (CO Node C to Node CDL D) + (Node CDL D to SWC CDL D). If this Ring Mileage calculation includes a fraction of a mile, the value is rounded up to the next full mile. If the ETCB portion of the total Ring Mileage is 20 miles or less, utilize the process set forth in Step 3 following to determine the mileage charges for each exchange telephone company involved. If the ETCB portion of the total Ring Mileage is 21 miles or over, utilize the process set forth in Step 4 through Step 6 following to determine the mileage charges for each exchange telephone company involved.

**Step 3** – Develop a Ring BP by dividing the ETCB portion of the total ring miles determined in Step 2 by the total ring miles determined in Step 1. Next apply this Ring BP to the total Ring Mileage for ETCB determined in Step 2 and apply the applicable Verizon rates for 1-20 total ring miles.

**Step 4** - If the ETCB portion of the total ring miles determined in Step 2 is 21 miles or more, apply the applicable Verizon 1-20 Ring Mileage rate to the first 20 miles.

**Step 5** - Determine the remaining ETCB portion of the total Ring Mileage by subtracting 20 miles from the ETCB portion of the total Ring Mileage determined in Step 2. Next apply the applicable Verizon rates for mile 21 and over up to the ETCB portion of the total ring miles.



Step 6 - The total charge for Ring Mileage is the sum of the charges for the first 20 miles calculated in Step 4 plus the remaining miles billed at the rate for 21 miles and over as calculated in Step 5.

3. Amplifiers

- a. **Mid-Span Amplifiers** provide for amplification of the signal to ensure acceptable optical levels. When required, amplification is performed in a CO when mid-span amplification of the signal is required between Nodes. Mid-span amplification occurs simultaneously in both directions (East to West and West to East). Verizon shall have sole responsibility in determining when amplification is required and the quantity and type of amplification necessary to maintain acceptable optical levels.
- b. **At-Node Amplifiers**<sup>1</sup> provide for amplification of the signal to ensure acceptable optical levels. At-Node amplification occurs in one or two directions (East to West and West to East). Amplification in two directions requires the use of two At-Node Amplifiers. Verizon shall have sole responsibility in determining when amplification is required and the quantity and type of amplification necessary to maintain acceptable optical levels.

4. Optical Transport Channels

- a. **Optical Transport Channels** allow for optical services to be multiplexed on to or off of the IOTS ring at locations equipped with an IOTS Node. An optical interface at the Node allows for connection of the applicable protocol to the Customer's equipment.
- b. Optical Transport Channels are provided on a Node-to-Node (i.e., point-to-point) basis.
- c. Optical Transport Channels are available on a protected or unprotected basis depending on the protocol being transmitted and the level of redundancy required for the optical channel. These channels may be ordered using a single-port interface (each a single channel per interface card) or using a multi-port interface to which a Multi-Port Interface Facility and Multi-Port Channels apply. Protected SONET Optical Transport Channels are also available as a 4-Fiber Protected Optical Transport Channel which is provisioned via two unprotected 0x1 wavelengths diversely routed on the IOTS ring. 4-Fiber Protected Optical Transport Channels are not permitted on Multi-Port Interface Facilities.
  1. A protected Optical Transport Channel allows for a single signal from the Customer to be duplicated and sent over separate diverse routes (working and protect) within the IOTS ring.

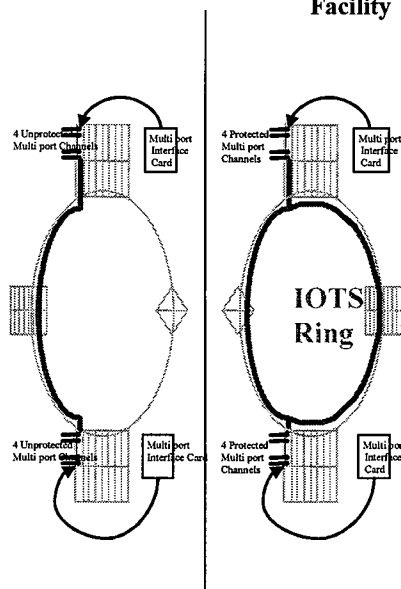
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<sup>1</sup> At-Node Amplifiers are provided on a grandfathered basis as set forth in Section (IV)(L) following.

2. An unprotected Optical Transport Channel is transmitted only on a single path along the IOTS ring with no high speed protection. Unprotected Optical Transport Channels provide minimum protection of the signal from the Customer and are vulnerable to fiber cuts, Node and amplifier equipment failures. Unprotected OCN Optical Transport Channels may be provisioned in a chain architecture around the ring to provision DSR service. In this case, the DSR nodes provide the protection switching in case of an IOTS unprotected Optical Transport Channel failure.
- d. **Multi-Port Interface Facilities** are used for connections made over an IOTS ring between two multi-port interface cards. Each of these Multi-Port Interface Facilities uses a single card for transport of multiple channels, referred to as Multi-Port Channels.
1. Enabling the use of a Multi-Port Interface Facility and channels on the IOTS ring increases the maximum number of channels available to the Customer at any Node. An IOTS Node may contain all single port interface cards (i.e., for provisioning of point-to-point circuits), all Multi-Port Interface Facilities and channels, or a combination of both.
  2. A Multi-Port Interface Facility is established between two specific Node (premise or CO) locations and is available as either an unprotected or protected channel. All optical multi-port channels provided over a Multi-Port Interface Facility must have the same origination and termination points on the ring.
  3. The diagram below illustrates both Unprotected and Protected Multi-Port Interface Facility scenarios:

**Unprotected Multi Port Interface Facility**

**Protected Multi Port Interface Facility**



4. Multi-Port Interface Facilities are offered in capabilities of 2.5 Gbps or 10 Gbps and are capable of supporting the following channel types, in any combination up to the maximum capacity of the Multi-Port Interface Facility.

<u>2.5 Gbps Multi-Port Interface Facility</u>	<u>10 Gbps Multi-Port Interface Facility</u>
ESCON	1 Gbps Fibre Channel
133 Mbps Fibre Channel	2 Gbps Fibre Channel
266 Mbps Fibre Channel	Gigabit Ethernet
531 Mbps Fibre Channel	1 Gbps FICON
1 Gbps Fibre Channel	2 Gbps FICON
FDDI	SONET OC48/OC48c
1 Gbps FICON	
Fast Ethernet	
D1 Video	
SONET OC3/OC3c	
SONET OC12/OC12c	
Gigabit Ethernet	

- e. Some protocols have facility distance limitations that may affect the design or availability of the IOTS ring or its Optical Transport Channels. The Multi-Port Interface Facility is provided with a short reach, 2-fiber interface with a 1310nm signal.
- f. All signals generated by Customer provided equipment and delivered to Verizon for multiplexing on to IOTS must meet industry standards and specifications for the underlying protocol. The Customer is responsible to perform any error detection and error correction of the data generated by its equipment. Verizon assumes no responsibility for the quality of the signal generated by the Customer or any Customer provided equipment and will deliver the signal to the receiving location in the same format and condition as generated by the Customer.
- g. Optical Transport Channels used in the provision of switched access services are limited to SONET OC3, OC12, OC48, and OC192 protected or unprotected Optical Transport Channels and 4-Fiber Protected Optical Transport Channels.
- h. Verizon will transmit the following protocols over IOTS SONET Optical Transport Channels:

SONET OC3 – for transmission of 155.52 Mbps synchronous optical data transmission capability. SONET OC3 is delivered over a single-port interface or a 2.5 Gbps multi-port interface.

SONET OC3c – for transmission of concatenated 155.52 Mbps synchronous optical data transmission capability. SONET OC3c is delivered over a single-port interface or a 2.5 Gbps multi-port interface.

SONET OC12 – for transmission of 622.08 Mbps synchronous optical data transmission capability. SONET OC12 is delivered over a single-port interface or a 2.5 Gbps multi-port interface.

SONET OC12c – for transmission of concatenated 622.08 Mbps synchronous optical data transmission capability. SONET OC12c is delivered over a single-port interface or a 2.5 Gbps multi-port interface.

SONET OC48 – for transmission of 2.488 Gbps synchronous optical data transmission capability. SONET OC48 is delivered over a single-port interface or a 10 Gbps multi-port interface.

SONET OC48c – for transmission of concatenated 2.488 Gbps synchronous optical data transmission capability. SONET OC48c is delivered over a single-port interface or a 10 Gbps multi-port interface.

SONET OC192 – for transmission of 9.953 Gbps synchronous optical data transmission capability. SONET OC192 is delivered over a single-port interface only.

SONET OC192c – for transmission of concatenated 9.953 Gbps synchronous optical data transmission capability. SONET OC192c is delivered over a single-port interface only.

- i. Verizon will transmit the following protocols over IOTS Data Optical Transport Channels:

D1 Video – for uncompressed digital transmission of video signals operating at 270 Mbps. D1 Video is delivered over a single-port interface or 2.5 Gbps multi-port interface.

10 Gigabit Ethernet LAN-PHY – 10GBASE-R (LAN PHY) interfaces offer an effective line rate of 10.3125 Gbps (10 Gbps of data traffic encoded in a 64B/66B protocol compared to the traditional 8B/10B protocol of Gigabit Ethernet). 10 Gigabit Ethernet LAN-PHY is delivered over a single-port interface only.

10 Gigabit Ethernet WAN-PHY – 10GigE data rate and format compatible with the SONET OC192c transmission format defined by ANSI. 10 Gigabit Ethernet WAN-PHY is delivered a single-port interface only.

ESCON – for transmission of one (1) 200 Mbps Enterprise Service CONnection channels between the same two IOTS Nodes used for computer-to-computer data exchange. An ESCON signal is limited to a maximum distance of 43km (physical route kilometers) between the locations involved. ESCON is delivered over a 2.5 Gbps multi-port interface only.

ETR/CLO – a channel for transmission of an 8 Mbps External Timing Reference/Control Link Oscillator signal for distributing time-of day

information to all central processing units in the Sysplex and to keep the Sysplex timer units synchronized with each other. An ETR/CLO signal is limited to a maximum distance of 40km (physical route kilometers) between the locations involved. ETR/CLO is delivered over a single-port interface only.

Fast Ethernet – for 100 Mbps transmission of Ethernet. Fast Ethernet is delivered over a single-port interface or 2.5 Gbps multi-port interface.

FDDI – for transmission of 100 Mbps Fiber Distributed Data Interface channels for general purpose interconnection between computers and peripheral equipment, including interconnection of Local Area Networks and other networks. FDDI is delivered over a single-port interface or 2.5 Gbps multi-port interface.

Fibre Channel – for transmission of 2.125 Gbps, 1.0625 Gbps, 531 Mbps, 266 Mbps, and 133 Mbps signals in a serial link between supercomputers, mainframes, workstations, desktop computers, storage devices, displays, and other peripherals. A Fibre Channel signal is limited to a maximum distance of 100km (physical route kilometers) between the locations involved. Fibre Channel signals at transmission speeds of 2.125Gbps, 1.0625Gbps, 531 Mbps, 266 Mbps, and 133 Mbps are delivered over a single-port interface. Fibre Channel signals may also be delivered over a multi-port interface as follows.

2.5 Gbps Multi-Port  
Interface Facility  
133 Mbps  
266 Mbps  
531 Mbps  
1.0625 Gbps

10 Gbps Multi-Port  
Interface Facility  
1.0625 Gbps  
2.125 Gbps

FICON – for transmission of 1 Gbps and 2 Gbps Fibre CONnection among mainframes, storage devices, and peripherals on a single channel. A FICON signal is limited to a maximum distance of 100km (physical route kilometers) between the locations involved. FICON is delivered over a single-port interface, a 2.5 Gbps multi-port interface, or a 10 Gbps multi-port interface.

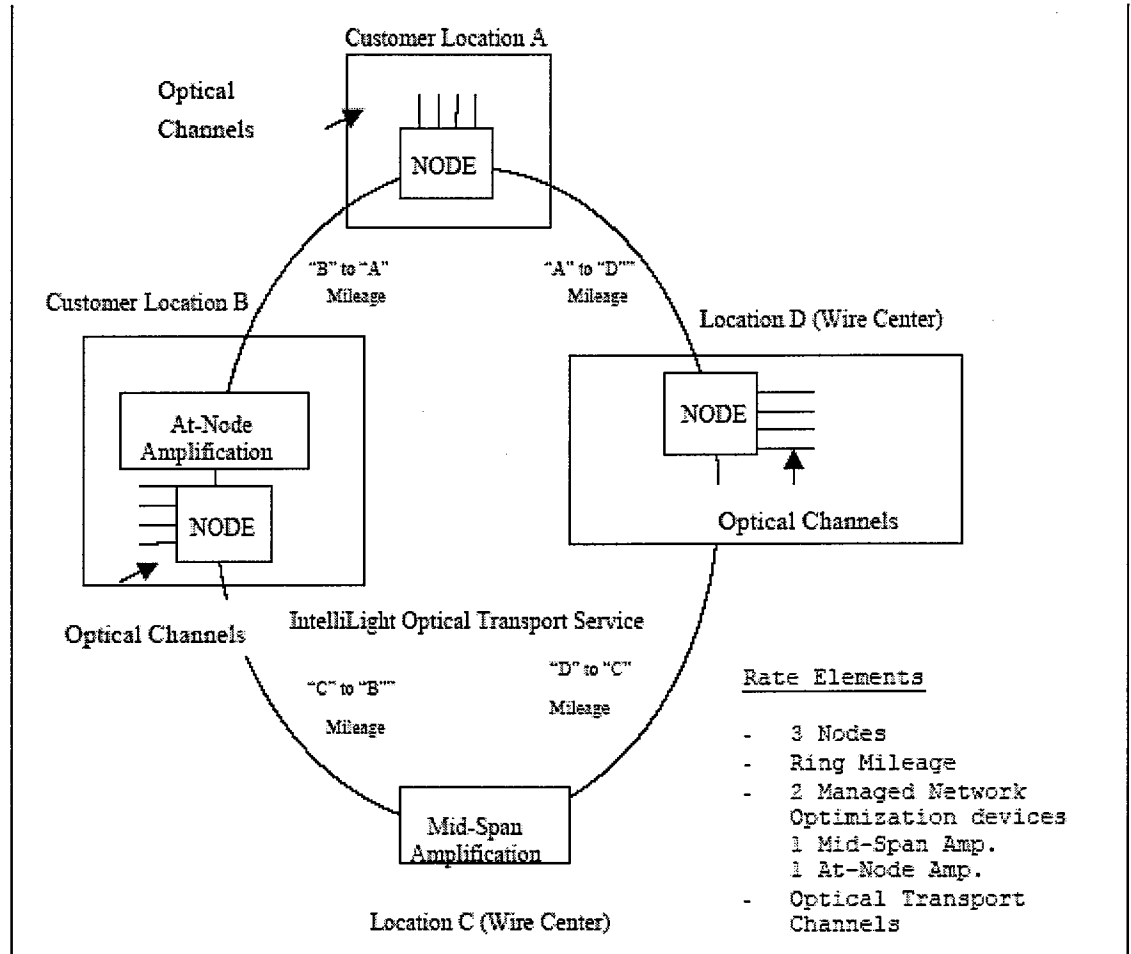
Gigabit Ethernet – for 1.0 Gbps transmission of Ethernet. Gigabit Ethernet is delivered over a single-port interface, a 2.5 Gbps multi-port interface, or a 10 Gbps multi-port interface.

ISC – for transmission of 1.06 Gbps Intersystem Channel for data caching, locking and queuing services between coupling facility and a central processing unit. An ISC signal is limited to a maximum distance of 40km (physical route kilometers) between the locations involved. ISC is delivered over a single-port interface only.

ISC3 – for transmission of 2.125 Gbps Intersystem Channel for data caching, locking and queuing services between coupling facility and a

central processing unit. An ISC3 signal is limited to a maximum distance of 100km (physical route kilometers) between the locations involved. ISC3 is delivered over a single-port interface only.

5. An example of an IOTS Ring is diagrammed below:



## B. Network Management Methods

The Customer has the option of purchasing one of the following network management methods for use with an IOTS special access service provided by Verizon. Network management methods will be available subject to compatibility of the current release of the network management methods software with the IOTS equipment deployed for the Customer's network.

- Customer Service Management
- Direct TL1 Monitoring

### 1. Customer Service Management (CSM)

- CSM is an optional feature which provides a Customer with real-time information about the operational status of its IOTS network. CSM

provides a network view of real-time detection and reporting of network alarm conditions within the Customer's IOTS network. In addition, CSM provides the Customer with the ability to generate basic network performance reports for its IOTS network. The Customer may also request network performance reports that are customized to meet their specific needs.

- b. The Customer must utilize Internet web access to connect its Customer-provided terminal equipment to Verizon's CSM management system. Access to the internet and any associated rates and charges are additional. The Customer is also responsible for obtaining communications software (i.e. Internet Explorer and Java that is compatible with the software Verizon utilizes to provide CSM). Verizon will work cooperatively with the Customer to determine compatibility of its communications software.
- c. Subject to the restrictions noted in Section (V)(B)(7)(a) and (b) following, CSM is provided coincident with the installation of the associated IOTS ring or may be added to an existing ring.

## 2. Direct TL1 Monitoring (DTM)

- a. DTM is an optional feature which provides a Customer with near real-time information about the operational status of its IOTS network over a TL1 connection. A TL1 connection is a machine-to-machine communication language protocol. The connection allows a Customer to monitor its IOTS network via a limited set of executable TL1 commands in order to query alarm and performance criteria.
- b. DTM enables the following:
  - 1. Near real-time access to system-generated alarm and performance messages originating from the Customer's IOTS network elements.
  - 2. Query and response capability that enables two-way communications with the capability to poll and retrieve messages, such as command alarms and performance messages.
  - 3. Access to ring inventory information that will enable the Customer to maintain its own inventory database containing network element configurations and usage records for active service channels.
  - 4. Notification that a power failure has occurred at an IOTS network element and that the affected network element has reverted to battery backup.
  - 5. Ability to monitor the ring, as well as all service channels riding the ring.
- c. The Customer must order two special access services (i.e., 56k DDS), provided by Verizon under Tariff, in order to ensure secure, dedicated

private line access and enable full redundancy for DTM. These special access services must originate at the Customer designated Premises and terminate at a DTM site designated by Verizon. Charges for these special access services are in addition to DTM charges.

- d. When requested by the Customer, and where technically feasible to do so, Verizon will provide encryption capabilities on the special access services used to access DTM. Verizon will specify any equipment or software required to provide encryption. Obtaining such equipment or software is the responsibility of the Customer. The Customer is also responsible for:
  - security of any equipment, servers, systems, or other facilities provided by the Customer and which have access to the DTM network; and
  - monitoring access to the DTM service using the facilities, systems, equipment, or servers provided by the Customer.
- e. Subject to the restrictions noted in Section (V)(B)(7)(a) and (b) following, DTM is provided coincident with the installation of the associated IOTS ring or may be added to an existing ring.

### III. TECHNICAL

#### A. Technical Specifications

1. The technical specifications for IOTS are delineated in Technical Publications GR-2918-CORE, Issue 4, GR-2979-CORE, Issue 3, GR-1312-CORE, Issue 4, ITU G.959.1, and ITU G.692.
2. The technical specifications for the protocols transmitted over IOTS Optical Transport Channels are delineated in the following technical publications:

<u>Protocol Transmitted</u>	<u>Technical Publication</u>
SONET OC3, OC12, OC48	GR-253-CORE, Issue 4
SONET OC3c, OC12c, OC48c	GR-253-CORE, Issue 4
SONET OC192, OC192c	GR-253-CORE, Issue 4
D1 Video	ANSI/SMPTE 259M –1997
10 Gigabit Ethernet WAN-PHY	ANSI/IEEE 802.3ae with WAN Interface Sublayer
10 Gigabit Ethernet LAN-PHY	ANSI/IEEE 802.3ae with LAN Interface Sublayer
ESCON, FICON	IBM Publication SA23-0394-02, Third Edition; IBM Publication GA23-0367-04, Fifth Edition; ANSI X3.296
ETR/CLO	IBM Publication GA24-2070
ISC	IBM Publication GA2076-00
ISC3	IBM Publication SA23-0395
Fast Ethernet	ANSI/IEEE X3.802.3, X3.802.3z
FDDI	ANSI/IEEE X3.802.3U, ANSI X3.166, ANSI X3.148
Fibre Channel	ANSI X3.303



3. Technical specifications are subject to change in accordance with changes adopted by standards-setting industry bodies. Such updates to technical specifications, as they occur, shall be automatically incorporated without the requirement to amend this Product Guide.

B. Reserved

#### IV. TERMS AND CONDITIONS

A. Deployment and Availability

1. IOTS offered pursuant to this Product Guide is offered as a jurisdictionally interstate service (i.e., the traffic is at least 10% or more interstate in nature). If the IOTS service is not jurisdictionally interstate, then Customer shall inform Verizon of the same and shall purchase such services (if available and offered by Verizon) pursuant to the applicable arrangement offered by Verizon (e.g., tariff or contract).
2. IOTS is currently available in the operating territories of the following Verizon Operating Telephone Companies:

East Operating Territories

Connecticut - Verizon New York Inc.  
Delaware - Verizon Delaware LLC  
District of Columbia - Verizon Washington, DC Inc.  
Maine - Verizon New England Inc.  
Maryland - Verizon Maryland Inc.  
Massachusetts - Verizon New England Inc.  
New Hampshire – Verizon New England Inc.  
New Jersey – Verizon New Jersey Inc.  
New York - Verizon New York Inc.  
Pennsylvania - Verizon Pennsylvania Inc.  
Rhode Island - Verizon New England Inc.  
Vermont - Verizon New England Inc.  
Virginia - Verizon Virginia Inc.  
West Virginia - Verizon West Virginia Inc.

West Operating Territories

Arizona - Verizon California Inc.  
California - Verizon California Inc., Verizon West Coast, Inc.  
Florida - Verizon Florida LLC  
Idaho - Verizon Northwest Inc.  
Illinois - Verizon North Inc., Verizon South Inc.  
Indiana - Verizon North Inc., Contel of the South Inc.  
Michigan - Verizon North Inc., Contel of the South Inc.  
Nevada - Verizon California Inc.  
North Carolina - Verizon South Inc.  
Ohio - Verizon North Inc.  
Oregon - Verizon Northwest Inc.

Pennsylvania - Verizon North Inc.  
South Carolina - Verizon South Inc.  
Texas - Verizon Southwest Inc.  
Virginia - Verizon South Inc.  
Washington - Verizon Northwest Inc.  
Wisconsin - Verizon North Inc.

3. Since IOTS is a dedicated high capacity customized network, it is deployed upon Customer request. Where Verizon does not have sufficient facilities and equipment available to meet Customer's request, Verizon may provide the service subject to additional special construction charges, if any. If Customer agrees to the special construction charges, Verizon and the customer shall enter into a separate agreement for such special construction.
4. The provisioning of IOTS is based on negotiated intervals between the Parties.
5. Verizon may discontinue the Service with no less than a 30-day written notice provided to the Customer. On and subsequent to the effective date of the Service discontinuance, Customer will no longer be able to purchase or order any new Service. However, Customer can add, move, or change its existing Service as long as such activity does not result in a new Commitment Period or an Extension of a Commitment Period. For existing Service ordered on a month-to-month term plan or that is being provided by Verizon on a month-to-month basis as set forth in Section (V)(C)(4) following, Customer will have six (6) months from the effective date of the Service discontinuance to convert the Service to another service provided by Verizon or disconnect the Service. For existing Service ordered under a term plan of 3, 5, or 7 years, Customer can retain the Service until the expiration date of the term plan. Upon expiration of the term plan, Customer must convert the Service to another service provided by Verizon or disconnect the Service, but in no event shall the Customer have less than six (6) months from the effective date of Service discontinuance to convert the Service to a different service provided by Verizon or to disconnect the Service.
6. Verizon may grandfather the Service with no less than a 30-day written notice provided to the Customer. On and subsequent to the effective date of the grandfathering of the Service, Customer will no longer be able to purchase or order any new Service. However, Customer can add, move, or change the existing Service as long as such activity does not result in a new Commitment Period or an Extension of a Commitment Period. Customer can retain the existing Service until the term plan expiration or on a month-to-month basis as specified in Section (V)(C)( 4) following.

## B. Product Limitations

1. IOTS Rings
  - a. Wholly Provided Rings: An IOTS ring provides connectivity to multiple Customer designated Premises (Nodes) for both Switched Access and Special Access IOTS. A ring must have a minimum of three Nodes at different locations or two Nodes at different locations with a Mid-Span

Amplifier. At least one (1) of the devices (Node or Mid-Span Amplifier) must be located in a CO and one (1) must be located at a Customer designated Premises.

For IOTS rings that are provided wholly by Verizon, Verizon is responsible for the overall design and configuration of the IOTS ring. The Customer must provide Verizon with complete and accurate information to design and construct the Customer's dedicated ring. Construction of the ring will not begin until such design and configuration are mutually agreeable to both the Customer and Verizon. The order date for the ring is the date on which the Customer provides Verizon with a complete and accurate ASR for the Service. In the event that the Customer cancels its request, or part of its request, for construction of the ring, cancellation charges will apply.

- b. Jointly Provided Rings (West Operating Territories only): For IOTS rings jointly provided by Verizon and one or more other exchange telephone companies in a multiple company billing arrangement, the IOTS ring must be configured with a minimum of three Nodes or two Nodes and one Mid-Span Amplifier. A minimum of one device (Node or Mid-Span Amplifier) must be provided by Verizon with that device being located in a CO and the remaining devices may be provided by one or more of the other exchange telephone companies jointly providing the service. If more than one device is provided by Verizon, the additional devices may be located at either a Customer designated Premises or in a CO. Jointly provided IOTS rings must meet all of the same requirements that are set forth in this Product Guide for wholly provided IOTS rings. The Customer or third party is responsible for engineering its portion of the jointly provided ring.

In the case of an IOTS ring that is jointly provided by Verizon and one or more other telephone companies in a multiple billing arrangement, the overall design and configuration of the IOTS ring must be mutually agreeable to Verizon, any other exchange telephone company(s) involved, and to the Customer. The multiple bill option allows all companies providing Service to bill the Customer for their portion of a jointly provided IOTS. Each company will determine the applicable charges, including all recurring and nonrecurring rates and charges, and forward the bill to the Customer. The Customer will remit the payments directly to each company.

#### C. Connection to Other Services

IOTS connects to other Verizon services only as expressly stated in this Section (IV)(C) (**Connecting Services**).

1. Dedicated SONET Ring (DSR)/Custom Connect Ring - Connection of DSR/Custom Connect Ring to an IOTS ring is provided over an equal speed unprotected Optical Transport Channel (e.g., a 155.52 Mbps unprotected channel would connect to an OC3 DSR node). Each Node on the DSR/Custom Connect Ring must be located at the same Customer designated Premises or in the same Verizon Central Office as its corresponding IOTS

Node. All other applicable DSR/Custom Connect Ring provisions apply to the derived DSR/Custom Connect Ring service.

2. IntelliLight® Broadband Transport (IBT)/Custom Connect - Connection of IBT and point-to-point Custom Connect to an IOTS ring is provided over an equal speed OC3/OC3c, OC12/OC12c, OC48/OC48c, or OC192/OC192c protected or unprotected Optical Transport Channel.

IBT/Custom Connect Capacity	Single Port Channel 2-Fiber or 4-Fiber	Multi-port 2.5 Gbps Interface Facility	Multi-port 10 Gbps Interface Facility
OC3/OC3c	SONET OC3/OC3c	SONET OC3/OC3c	
OC12/OC12c	SONET OC12/OC12c	SONET OC12/OC12c	
OC48/OC48c	SONET OC48/OC48c		SONET OC48/OC48c
OC192/OC192c	SONET OC192/OC192c		

3. Verizon Optical Networking - Connection of a Verizon Optical Networking OC3c or OC12c Ethernet-to-SONET mapped service is provided over an equal speed SONET OC3c or OC12c protected Optical Transport Channel. Connection of a Verizon Optical Networking 1 Gbps Ethernet Full Rate service is provided over a Gigabit Ethernet Optical Transport Channel. Connection of a Verizon Optical Networking Gigabit Fibre Channel and/or Gigabit FICON service is provided over a Gigabit Fibre Channel and/or Gigabit FICON Optical Transport Channel.

Verizon Optical Networking Service	Single Port Channel	Multi-port 2.5 Gbps Interface Facility	Multi-port 10 Gbps Interface Facility
Fast Ethernet mapped to OC3c	SONET OC3c	SONET OC3c	
GigE12/600Mbps Ethernet mapped to OC12c	SONET OC12c	SONET OC12c	
Ethernet to SONET mapped 1Gbps Ethernet full rate	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
1Gbps FICON	1Gbps FICON	1Gbps FICON	1Gbps FICON
Fibre Channel	1Gbps Fibre Channel	1Gbps Fibre Channel	1Gbps Fibre Channel

D. Reserved

E. Responsibilities of the Parties

1. Shared Network Arrangement

- a. Either a Host Customer or a Service User may place an order to establish, change, disconnect or move IOTS provided with the SNA

option. Prior to placing an order, the ordering Customer must obtain a signed letter of authorization from the other Customer participating in the SNA. The letter of authorization must be signed by both the Host Customer and the Service User and include the CFA and Billing Account Number (**BAN**) of the Host Customer's Service. In the event that a Service User requests the connection of a service to a Host Customer's Service which is, in turn, part of a separate SNA, the ordering Customer must also obtain and provide to Verizon the appropriate BAN and CFA of the third party's service, in order to identify the complete circuit for purposes of maintenance and testing continuity. Customer will be responsible for notifying Verizon of service outages and assume responsibility for ensuring cooperative testing among the three parties (i.e., Verizon, Customer and third party). The ordering Customer must provide a copy of the letter of authorization to Verizon at the time the order is placed.

- b. Upon receipt of a letter of authorization for an SNA from the Host Customer, Verizon will undertake to connect the Service User's circuits to the Host Customer's Service and to establish and maintain separate billing for the Service User's portion of the Service.

#### F. Space and Power

The Customer shall furnish or arrange to have furnished to Verizon, at no charge, equipment space and electrical power required by Verizon to provide Services at the Points of Termination of such Services. The selection of ac or dc power shall be mutually agreed to by the Customer and Verizon. The Customer shall also make necessary arrangements in order that Verizon will have access to such spaces at reasonable times for installing, testing, repairing or removing Verizon Services.

The Customer will be billed additional charges for any charges levied on Verizon for space and power required to place Nodes on Verizon's side of the network interface.

#### G. Service Interruptions

1. **Service Interruption** is defined as a condition which renders the IOTS unusable to Customer solely as a result of failure of a facility or equipment within the Verizon network that is used to furnish Service under this Product Guide. Verizon reserves the right to determine when the IOTS is unusable based on its internal procedures. A Service Interruption period starts when Verizon is notified by Customer that the Service is inoperative. Notification must be in a manner and format designated by Verizon.
2. Subject to Section (IV)(G)(3) following, Customer is eligible to receive certain credits (as set forth in more detail below) (**Credit Allowance**) on an affected IOTS if such IOTS experiences a Service Interruption.
  - a. For Nodes and Mid-Span Amplifiers, any single Service outage of four hours or more due solely to a Verizon facility failure will result in a credit of 100% of the monthly rate for the applicable IOTS Node or Mid-Span

Amplifier device affected. Only one such credit is allowed in a single month's billing period.

- b. For single port channels, Multi-Port Interface Facilities and multi-port channels, the following credits will be applied:
  - 1. For protected Optical Transport Channel or Multi-Port Interface Facility, any Verizon facility failure which is not restored within one minute will result in a credit of 100% of the monthly rate for the applicable protected Optical Transport Channel affected. Only one such credit is allowed in a single month's billing period.
  - 2. For unprotected Optical Transport Channel or Multi-Port Interface Facility, no credit applies for a Service outage on Optical Transport Channels for which no protection is provided by Verizon.

3. Credit Allowance will not apply:

- a. When Customer fails to report the Service Interruption to Verizon, or fails to report in a manner consistent with the processes or procedures outlined by Verizon; or
- b. When the Service Interruption was caused in whole or in part by the act or omission of Customer or a party authorized by Customer to use the Service; or
- c. When the Service Interruption was due to the failure of power, equipment, service, or systems provided by Customer or third parties; or
- d. For any period of Service Interruptions in which Verizon is not afforded access to the Premises where the Service is terminated; or
- e. For any period of Service Interruptions in which Customer has agreed to release the Service to Verizon for maintenance purposes, for service rearrangements or moves as described in Section (V)(D)(3) following, or for the implementation of an order for a change in the Service; or
- f. For any period of scheduled maintenance or scheduled downtime where Customer has received prior notification from Verizon; or
- g. For any period of temporary discontinuance of Service due to characteristics and methods of operation of any circuits, facilities, or equipment not provided by Verizon and associated with the facilities utilized to provide Services under this Product Guide which interfere or impair the Service provided by Verizon; or
- h. For any period of Service Interruption when Customer elects not to release the Service for testing and/or repair; or
- i. For any Service Interruption caused by or related to a Force Majeure event.

- j. When one or more channels utilizing a multi-port interface card require(s) maintenance, all channels provisioned over that multi-port interface card will be interrupted. No credit will be made for such periods during which all channels on the multi-port interface card are interrupted to allow Verizon to perform required maintenance.

H. Reserved

I. Reserved

J. Conversions and Upgrades

1. Customers who wish to convert existing Custom Connect, DSR, IBT, or High Capacity services to IOTS may do so without conversion charges (i.e., termination liability and installation charges) as long as the total capacity of the IOTS purchased by the Customer is not less than the total capacity of the services being converted.
  - a. A conversion is defined as the replacement of one (1) or more in-service Custom Connects, DSRs (equipped with enhanced Nodes or with Nodes that are not enhanced), IBTs or High Capacity services with a single IOTS.
    1. At the Customer's option, the replacing IOTS may also include a new DSR that utilizes IOTS SONET Optical Transport Channels as the backbone transmission facilities between the DSR enhanced Nodes.
    2. For each existing Custom Connect, DSR, IBT or High Capacity service being converted, the replacing IOTS must include a SONET Optical Transport Channel that has an optical carrier rate equal to, or greater than, the optical carrier rate of the service being converted. For example, when converting one existing OC12 DSR to IOTS, the IOTS must include a SONET Optical Transport Channel with an OC12 or greater.
3. The Commitment Period for the term plan of the replacing IOTS must extend beyond the expiration date of the Commitment Period for the term plan of the service being converted as follows:
  - a. When converting one existing service to IOTS, the Commitment Period for the term plan of the replacing IOTS must have an expiration date that extends beyond the expiration date of the Commitment Period for the term plan of the existing service.
  - b. When converting two or more existing services to a single IOTS, the Commitment Period for the term plan of the replacing IOTS must have an expiration date that extends beyond the latest expiration date of the Commitment Period for the term plans of the existing service(s).

4. The replacing IOTS must be configured as follows.
  - a. Where one existing DSR is converted to IOTS, the replacing IOTS must have at least one Customer designated Premises Node location and one CO Node location in common with the existing DSR being replaced.
  - b. Where two or more existing DSRs are converted to a single IOTS, the replacing IOTS must have at least one (1) Customer designated Premises Node location and one (1) CO Node location in common with either of the existing DSR being replaced.
  - c. Where one or more existing Custom Connect/IBT or High Capacity service is converted to IOTS, the replacing IOTS must have at least one Customer designated Premises Node location in common with the existing service being replaced.

K. Shared Use of Switched and Special Access

Shared Use of switched and special access on IOTS is allowed through a common interface.

L. Grandfathered Features/Functionality

The At Node Amplifier rate element was grandfathered as of August 15, 2005. IOTS in-service on or prior to August 16, 2005, continues to be charged for At Node Amplifiers and remains under the Category I rate structure. The At Node Amplifier rate element does not apply to customers purchasing new IOTS rings after August 16, 2005 or to existing customers who converted from Category I to Category II rates.

**V. APPLICATION OF RATES AND CHARGES**

A. Rate Structure

1. Category I and Category II Rates

- a. Rates and charges for IOTS Nodes, Ring Mileage, At-Node Amplifiers, Mid-Span Amplifiers and Optical Transport Channels which were in-service as of, or ordered prior to, August 16, 2005 are subject to Category I rates, unless the Customer subsequently converted to Category II rates or converts to Category II rates in accordance with (g) following.
- b. Rates and charges for IOTS Nodes, Ring Mileage, Mid-Span Amplifiers and Optical Transport Channels ordered on or after August 16, 2005 are subject to Category II rates.
- c. Category I rates were grandfathered as of August 16, 2005 and apply to IOTS that was in-service as of, or ordered prior to, August 16, 2005, unless the customer subsequently converted to Category II rates or converts IOTS billing to Category II rates in accordance with (g) following.



Category I rates include separate rates and charges for At-Node Amplifiers.

- d. Category II rates apply to each IOTS ordered on or after August 16, 2005. Category II rates also apply to Nodes, Mid-Span Amplifiers, Ring Mileage, and Optical Transport Channels ordered on or after August 16, 2005 as an addition to an existing IOTS, regardless of whether or not such existing IOTS is subject to Category I or Category II rates. When Verizon's network design for such addition to an existing IOTS requires that an At-Node Amplifier be added to an existing Node that is billed at Category I rates, the billing for such Node will be converted to the Category II Node rate element, which Node rate element includes amplification at the Node.
- e. Category II rates also apply to IOTS that were converted to Category II rates or are converted from Category I rates to Category II rates in accordance with (g) following. Category II rates do not include separate rates and charges for At-Node Amplifiers which are provided as part of the Node rate element on or after August 16, 2005.
- f. A customer subject to Category I rates under (c) preceding may convert to Category II rates subject to the following:
  - 1. The customer must submit an access order for the conversion to Category II rates.
  - 2. Separate rates and charges applicable to the At-Node Amplifier under Category I rates shall cease coincident with the date that billing at Category II rates commences.
  - 3. A new Commitment Period commences with the conversion from Category I rates to Category II rates. The customer must select a new Commitment Period from those offered under (V)(B)(1) following. The new Commitment Period must be equal to, or longer than, the original Commitment Period for the IOTS that was subject to the Category I rates. For example, an IOTS under a 5-year Commitment Period at Category I rates may only convert to a new 5-year Commitment Period or a new 7-year Commitment Period upon conversion to Category II rates.
  - 4. There can be no physical work activity (e.g., moves, additions, changes) associated with the conversion to Category II rates. Upon conversion, all terms and conditions of this Product Guide shall apply to the converted IOTS Service, including any applicable termination liability and Minimum Period obligations.
  - 5. Conversion from Category I rates to Category II rates is subject to all Minimum Period and/or termination liability as they apply for early termination of the Category I term plan. Additionally, conversion to Category II rates is subject to the requirements set forth in (1) through (4) preceding.

2. Nodes

- a. Monthly recurring rates apply per Node for both Switched Access and Special Access 4-channel Primary or Expansion Customer Premises Nodes and 4-channel Primary or Expansion Central Office Nodes. Monthly recurring rates also apply per Node for both Switched Access and Special Access 16-channel Primary or Expansion Customer Premises Nodes and 16-channel Primary or Expansion Central Office Nodes.
- b. Nonrecurring charges apply for the initial installation of Service and for any subsequent installation for both Switched Access and Special Access 4-channel and 16-channel Primary or Expansion Customer Premises Nodes and Central Office Nodes. A nonrecurring charge also applies to upgrade a 4-channel primary Node to a 16-channel primary Node or a 4-channel expansion Node to a 16-channel expansion Node.

3. Ring Mileage

A per mile monthly recurring rate applies per mile for both Switched Access and Special Access IOTS rings.

4. Amplifiers

a. Mid-Span Amplifiers

A monthly recurring rate applies per Mid-Span Amplifier device for both Switched Access and Special Access IOTS.

Nonrecurring charges apply for the initial installation of the Mid-Span Amplifier and for any subsequent installation for both Switched Access and Special Access Mid-Span Amplifier device.

b. At-Node Amplifiers

A monthly recurring rate applies per At-Node Amplifier device for both Switched Access and Special Access IOTS in-service as of, or ordered prior to, August 16, 2005 (subject to Category I rates).

Nonrecurring charges apply for the initial installation of the At-Node Amplifier and for any subsequent installation for both Switched Access and Special Access At-Node Amplifier device.

5. Optical Transport Channels

- a. Monthly recurring rates apply per channel for both Switched Access and Special Access IOTS. The monthly rate for a point-to-point Optical Transport Channel applies for the entire Node-to-Node connection.

- b. Nonrecurring charges apply for the initial installation of the Optical Transport Channels and for any subsequent installation for both Switched Access and Special Access Optical Transport Channels.
- c. When an Optical Transport Channel is ordered to connect with DSR, IBT, Custom Connect, or Verizon Optical Networking the optical channel will be billed to the DSR, IBT, Custom Connect, or Verizon Optical Networking Customer, as applicable.
- d. When an Optical Transport Channel is delivered over a Multi-Port Interface Facility, rates and charges apply for the Multi-Port Interface Facility and for each multi-port channel riding the Multi-Port Interface Facility. The Multi-Port Interface Facility must be billed to the same Customer who subscribes to the IOTS ring. Multi-Port channels may be provided in an SNA.

6. Network Management Methods

- a. **Customer Service Management (CSM)**
  - 1. A monthly recurring rate applies, per ring, for each IOTS provided with CSM. CSM may not be provided in an SNA.
  - 2. CSM nonrecurring charges apply as follows:
    - a. A Node Setup charge applies, per primary or expansion Node, for each Node that is equipped with CSM at the time that CSM is initially established on the IOTS.
    - b. An Initial CSM Setup charge applies for establishment of the Customer's initial CSM database partition. The initial CSM database partition includes setup for up to six (6) users.
    - c. A Setup of Additional Users charge applies for the setup of up to six (6) additional users beyond those users included with the setup of initial or additional database partitions.
    - d. A Setup of Additional Partition charge applies for the setup of an additional CSM database partition created for the same Customer. Each additional CSM database partition provides for the setup of up to six (6) additional users.
    - e. An Add/Remove Node charge applies, per primary and expansion Node, for each Node that is added to, or removed from, an IOTS ring equipped with CSM subsequent to the initial establishment of CSM.
    - f. A Consultation and Support charge applies for each thirty (30) minutes or fraction thereof that the Customer requests Verizon consultation and support of its CSM network. This charge does not apply during initial setup of CSM.

- g. A Change in Network Management Method charge applies, per primary and expansion Node, when the Customer requests a change in network management method (e.g., from CSM to DTM).
3. The Customer may retrieve basic reports containing performance-monitoring information on its IOTS network. Basic reports are available at no additional charge to the Customer. The Customer may also request that a report be customized to meet its particular needs. Verizon may provide the customized reports subject to additional rates and charges. If Customer agrees to the additional rates and charges, Verizon and the customer shall enter into a separate agreement for such customized reports.
- b. Direct TL1 Monitoring (**DTM**)
    - 1. A DTM monthly recurring charge applies, per ring, for each IOTS provided with DTM. DTM may not be provided in an SNA.
    - 2. DTM nonrecurring charges apply as follows:
      - a. A Node Setup charge applies, per primary or expansion Node, for each Node that is equipped with DTM at the time that DTM is initially established on the IOTS.
      - b. A DTM Setup charge applies for establishment of the Customer's DTM database partition.
      - c. An Add/Remove Node charge applies, per primary and expansion Node, for each Node that is added to, or removed from, an IOTS ring equipped with DTM subsequent to the initial establishment of DTM.
      - d. A Consultation and Support charge applies for each thirty (30) minutes or fraction thereof that the Customer requests Verizon consultation and support of its DTM network. This charge does not apply during initial setup of DTM.
      - e. A Change in Network Management Method charge applies, per primary and expansion Node, when the Customer requests a change in network management method (e.g., from DTM to CSM).

**B. Term Plans**

- 1. IOTS is available for term plans of 3, 5, and 7 years (**Commitment Periods**) for the Nodes, Ring Mileage, Mid-Span Amplifiers, At-Node Amplifiers, Optical Transport Channels and Multi-Port Interface Facilities.

2. Nodes, Mid-Span Amplifiers, and SONET Optical Transport Channels added subsequent to the initial installation may be coterminous to the expiration date of the IOTS at the rates and charges specified for the term plan on the existing IOTS or may require an extension to the existing term plan as follows:
  - a. If the addition is prior to the 21st month for an existing 3-year term plan, prior to the 36th month for an existing 5-year term plan, or prior to the 50th month for an existing 7-year term plan, the addition will be coterminous to the expiration date of the IOTS.
  - b. If the addition is after the aforementioned periods, the Customer must extend the Commitment Period of its existing term plan for an additional one (1) year for a 3-year term plan, an additional two (2) years for a 5-year term plan, or an additional three (3) years for a 7-year term plan.
3. At any time during the Commitment Period of an existing term plan, the Customer may discontinue that term plan in order to change to a new term plan with an equal or longer Commitment Period, an equal or greater bandwidth capacity/transmission speed, and all of the same locations of the Service.
4. Data Optical Transport Channels added subsequent to the initial installation will be coterminous to the expiration date of the IOTS at the rates and charges specified for the term plan on the existing IOTS.
5. The addition of SONET and/or Data Optical Transport Channels subsequent to the initial installation of Service may also require the addition of an expansion Node(s) and/or amplification device(s) to accommodate the increase in channels.
6. A change in the type (e.g., Fibre Channel to FICON) or optical carrier rate (e.g., OC3 to OC12) of the Optical Transport Channel is treated as a discontinuance of the existing channel and an installation of a new Optical Transport Channel.
7. CSM and DTM are provided under a term plan of 3, 5, or 7 years, as described following.
  - a. The duration of the term plan for CSM or DTM must be the same duration as the term plan for the IOTS Nodes provided with CSM or DTM.
  - b. The expiration date of each CSM or DTM added subsequent to the initial installation of the associated IOTS must be coterminous to the expiration date of the associated IOTS, provided the addition is prior to the 21st month for a 3-year term plan, prior to the 36th month for a 5-year term plan, or prior to the 50th month for a 7-year term plan. A CSM or DTM added after the aforementioned periods requires extension of the Commitment Period for the associated IOTS for an additional one (1) year for a 3-year term plan, an additional two (2) years for a 5-year term plan, or an additional three (3) years for a 7-year term plan, resulting in the establishment of a new term plan that includes both the IOTS and the CSM or DTM under the same term plan with the same expiration date.

- c. CSM or DTM is subject to termination liability if the Service is disconnected prior to completion of the existing Commitment Period. Section (V)(6) following applies to termination of CSM or DTM prior to completion of the existing Commitment Period. Changes in network management method (e.g., from CSM to DTM) will be made without termination liability subject to the Change in Network Management Method charge.

C. Extension and Renewal of Commitment Period

1. The Customer has the option, within sixty (60) days prior to the expiration date of its Commitment Period, to renew its expiring term plan to a term plan with a longer Commitment Period, for which time in service credit will be allowed for the expiring term plan. The Commitment Period selected for the new term plan must be longer than the Commitment Period of the expiring term plan as follows:
  - An expiring 3-year term plan may be renewed to either a 5-year or 7-year term plan
  - An expiring 5-year term plan may be renewed to a 7-year term plan
2. The rate for the longer Commitment Period will apply effective with the first bill day following expiration of the Commitment Period for the existing term plan and continue through the remainder of the Commitment Period associated with the new term plan. No adjustment for the increased discount associated with the new term plan will be made to the monthly rates already billed on the expiring term plan.
3. When the Customer renews the term plan on an existing Service for a longer term plan in accordance with Section (C)(1) preceding, the Customer is eligible for Time in Service Credit (TISC), reducing the potential termination liability otherwise associated with a new term plan.
  - a. TISC is granted on a per rate element basis for all rate elements for which termination liability applies.
  - b. TISC is equal to the number of months the original term plan was in effect prior to the renewal to a longer term plan.
  - c. When calculating any termination liability that may be assessed for early disconnection of Service or cancellation of a term plan, TISC will be applied to the beginning of the period that termination liability is assessed (i.e., beginning with the date of disconnection or cancellation).
  - d. For example, assume (1) Customer completes a 3-year term plan and then converts to a new 5-year term plan; and (2) Customer then cancels Service after 1 year of the new term plan. Customer would be subject to termination liability for one year (5 years less 1 year completed, less 3 years TISC from completion of the expired term plan = 1 year subject to termination liability).

4. Upon the expiration of any Commitment Period, Verizon will continue to provide the Service on a month-to-month basis, under the same terms and conditions of the current term plan, until the earliest to occur of the date (a) the Customer cancels the Service, (b) Verizon discontinues the Service as specified in Section (IV)(A)(5) preceding, or (c) subject to Section (IV)(A)(5) and (IV)(A)(6) preceding, a valid order for a new term plan is accepted by Verizon from Customer.

D. Additional Charges

1. Reserved
2. Administrative Change

Administrative changes do not involve a physical change of IOTS for Customer. The administrative change will be made without charge(s) to the Customer. Such changes require the continued provision and billing of IOTS to Customer.

3. Moves and Changes

A move involves a change in the physical location of the Customer designated Premises which also involves a connection to a different rate demarcation point. The charges for the move are dependent on whether the move is to a new location within the same building or to a different building.

- a. Moves Within the Same Building

When the move is to a new location within the same building (Inside Move), a non-recurring charge for the Inside Move will apply. There will be no change in the Minimum Period requirement, and termination liability does not apply.

- b. Moves To a Different Building

Moves to a different building (Outside Move) will be treated as a discontinuance and start of Service and all associated nonrecurring charges will apply. New Minimum Period and/or Commitment Period requirements will be established for the new Services. The Customer will also remain responsible for satisfying all outstanding Minimum Period and/or termination liability charges for the discontinued Service.

4. Reserved

5. Order Cancellation

- a. A Customer may cancel an access order for the installation of IOTS at any time prior to notification by Verizon that Service is available for the Customer's use. The cancellation date is the date Verizon receives written or electronic notice from the Customer that the order is to be cancelled.

- b. A Customer may negotiate an extension of a Service Date of an access order for installation of new IOTS or rearrangements of existing IOTS and a Service Date Change Charge will apply. However, the new Service Date cannot exceed the originally established Service Date by more than 30 calendar days. On the 31st day beyond the original Service Date, the access order will be cancelled and an appropriate Cancellation Charge will be applied.
- c. If a Customer or a Customer's end user does not accept, or is unable to accept, Service within 30 calendar days after the original Service Date or fails to negotiate a new Service Date that is within thirty (30) calendar days after the original Service Date, the access order will be cancelled on the 31st calendar day after the original Service Date. Cancellation charges will apply.
- d. When a Customer cancels an access order, or part of an access order, before the Service Date, Verizon will apply cancellation charges to the order, unless the order is cancelled because Verizon missed the Service Date.
- e. Cancellation charges may apply if the Customer cancels an order, or part of an order, for the dedicated ring after providing Verizon with written or electronic notification to begin construction of the ring. Cancellation charges apply as follows:
  - 1. When a Customer cancels the order, or part of the order, for its dedicated ring within the first thirty (30) days following written or electronic notification to Verizon to begin construction of the ring, no cancellation charges will apply provided if construction has not begun.
  - 2. When a Customer cancels the order, or part of the order, for its dedicated ring within the first thirty (30) days following written or electronic notification to Verizon to begin construction of the ring, cancellation charges will apply if construction has begun.
  - 3. When a Customer cancels the order, or part of the order, for its dedicated ring on the 31st day, but no later than the 60th day following written or electronic notification to Verizon to begin construction of the ring, cancellation charges will apply.
  - 4. When a Customer cancels the order, or part of the order, for its dedicated ring on the 61st day following written or electronic notification to Verizon to begin construction of the ring, up to the date of notification that construction of the ring is complete, cancellation charges will apply. If the Customer cancels the order, or part of the order, after construction is complete, Minimum Period charges and termination liability also apply.



## 6. Termination Liability

- a. Termination liability applies to IOTS and is charged per monthly rate element on all Nodes, Ring Mileage, Mid-Span Amplifiers, At-Node Amplifiers, Optical Transport Channels, Multi-Port Interface Facilities and network management methods. Data Optical Transport Channels are not subject to termination liability; however, such channels are subject to a Minimum Period of three months. In the event a Customer removes a Node from an IOTS ring, resulting in a reduction to the Ring Mileage, then the termination liability will apply to the Node(s) and to the amount by which the Ring Mileage was reduced, as a result of the removal of the Node.
- b. A separate termination liability charge is assessed for each rate element associated with the disconnected IOTS or a network management method.

For example, assume that the Customer subscribes to an IOTS ring that is arranged with the Direct TL1 Monitoring optional feature. Further, assume that the Customer disconnects the IOTS ring along with the Direct TL1 Monitoring optional feature prior to the end of the Commitment Period. Then, the Customer shall pay termination liability on the Nodes, Ring Mileage, At-Node Amplifiers, Optical Transport Channels, and the Direct TL1 Monitoring optional feature monthly recurring rate elements.

For another example, assume that the Customer subscribes to an IOTS ring that is arranged with the Direct TL1 Monitoring optional feature. Further, assume that the Customer disconnects the Direct TL1 Monitoring optional feature prior to the end of the Commitment Period. Then, the Customer shall pay termination liability on the Direct TL1 Monitoring optional feature monthly recurring rate elements.

- c. Termination liability will not apply when the Commitment Period on any IOTS Service or network management method is changed to an equal or a longer Commitment Period, a 4-channel primary Node is upgraded to a 16-channel primary Node, or a 4-channel expansion Node is upgraded to a 16-channel expansion Node and the bandwidth capacity/transmission speed of the IOTS Service does not decrease, and all of the locations of the Service remain unchanged.
- d. Termination liability will apply when the conditions in (c) preceding are not met and/or the Customer cancels Service or a portion of the Service prior to expiration of the current term plan period. If the cancellation occurs within the first two years of a term plan, termination liability is equal to one hundred percent (100%) of the monthly charges for the unexpired portion of the first two years, and twenty five percent (25%) of the monthly charges for the remainder of the term plan. If the Customer cancels after the first two years of a term plan, then termination liability is equal to twenty five percent (25%) of the monthly charges for the remaining life of the term plan.

7. Minimum Period

- a. Data Optical Transport Channels are subject to a Minimum Period of three months. If Data Optical Transport Channels are disconnected during the Minimum Period, Customer shall pay to Verizon one hundred percent (100%) of the monthly recurring rates from the date of disconnection through the end of the Minimum Period.
- b. IOTS rings (Nodes, Mid-Span Amplifiers, Optical Transport Channels, Multi-Port Interface Facilities and network management methods) are subject to a Minimum Period of two years.

8. Reserved

9. Service Date Change Charge

Access order Service Dates for the installation of new Services or rearrangements of existing Services may be changed, but the new Service Date may not exceed the original Service Date by more than thirty (30) calendar days. When, for any reason, the Customer indicates that Service cannot be accepted for a period within thirty (30) calendar days of the Service Date, and Verizon accordingly delays the start of Service, a Service Date Change Charge will apply.