

5. FRAME RELAY SERVICE

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5. FRAME RELAY SERVICE

5.1 DESCRIPTION

5.1.1 GENERAL

Employing digital technology, Frame Relay Service (FRS) provides high speed access and throughput to and among Local Area Networks (LANs), as well as computers. Utilizing statistical multiplexing, FRS enables users to allocate circuit bandwidth to applications as needed, up to the maximum bandwidth purchased, rather than assigning fixed channels to specific applications. FRS supports transmission speeds of up to 44.736 Mbps. The regulations, rates and charges found in this Catalog apply to 56 kbps through 44.736 Mbps intraexchange FRS and apply to interexchange FRS above 56 kbps.

FRS requires the use of customer terminal equipment that functions as a multiplexer/bridge/router. This terminal equipment must be purchased separately from the FRS and must conform to CCITT and ANSI standards set forth in technical publications listed in this Catalog under Reference to Technical Publications. The terminal equipment accumulates customer data and puts it into a frame relay format suitable for transmission over the ACS Network.

Frame Relay Service conforms to CCITT and ANSI standards set forth in technical publications listed in this Catalog under Reference to Technical Publications.

5.1.2 SERVICE ELEMENTS

A. Network Interface

The point at which a customer's data transmissions first enter the network supporting Frame Relay Service is the network interface. It is the point of interconnection between Company communications facilities and customer terminal equipment.

5. FRAME RELAY SERVICE

5.1 DESCRIPTION

5.1.2 SERVICE ELEMENTS (CONT'D)

B. Access Link

For 4-Wire 56 kbps through 1.544 Mbps Frame Relay Service, FRS Access Links provide access to the ACS Frame Relay Network, connecting customer facilities at the network interface, or connecting other frame relay networks' facilities at the network interface with an Information Transfer service element. The 56 or 64 kbps Access Link utilizes the 56 or 64 kbps Information Transfer service element, and the 1.544 Mbps Access Link utilizes 56 kbps through 1.544 Mbps Information Transfer service elements.

Frame Relay uni-directional polling is required on the Access Link when used in conjunction with User-To-Network Information Transfer. Frame Relay bi-directional polling is required on the Access Link when used in conjunction with the Network-To-Network Information Transfer.

Company-provided, private line transport facilities or other compatible facilities provided by another company, which has a point-of-presence in the Company central office from which FRS is provided, must be used to access 44.736 Mbps FRS.

C. Stand-Alone Access Link

A Stand-Alone Access Link connects customer facilities to frame relay service networks provided by service providers other than the Company. It does not connect to an ACS Frame Relay Network. A Stand-Alone Access Link requires uni-direction polling. Private Line transport mileage may be required in conjunction with a Stand-Alone Access Link in order to connect the customer's serving wire center, or node, with the serving wire center, or node, of another frame relay service provider.

D. Port

In the ACS Network, ports are the physical entry points for Access Links and the originating and terminating points for Permanent Virtual Connections. Ports include the electronic equipment used in connecting these service elements to the ACS Network. On each port, a customer may allocate bandwidth to applications at customer-designated transmission speeds up to 56 or 64, 112 or 128, 224 or 256, 336 or 384, 448 or 512, 672 or 768 kbps, 1.544 Mbps, or 44.736 Mbps.

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5. FRAME RELAY SERVICE

5.1 DESCRIPTION

5.1.2 SERVICE ELEMENTS (CONT'D)

E. Service Point

ACS Network Ports are located at ACS Service Points - geographic locations designated by the Company where the ACS Network is to be accessed.

F. User-To-Network Information Transfer (UNIT)

The User-To-Network Information Transfer (UNIT) service element transfers information between the User-To-Network Interface (UNI) and the ACS Frame Relay Service Network.

User-To-Network Information Transfer provides the physical entry point into the ACS Network for Access Links. The UNIT includes the associated port, unidirectional Permanent Virtual Connections (PVCs) and ACS Frame Relay switching equipment. UNIT PVCs are provisioned at customer-selected Committed Information Rates (CIRs), and at port speeds, dependent upon the customer's data networking requirements. UNIT provides unidirectional polling between the customer's facilities and the ACS FRS Network.

G. Network-To-Network Information Transfer (NNIT)

Available on a 4-Wire basis only, the Network-To-Network Information Transfer (NNIT) service element transfers information between the ACS Frame Relay Service Network and another frame relay service network.

Network-To-Network Information Transfer provides the physical entry point into the ACS Network for Access Links. The NNIT includes the associated port, unidirectional Permanent Virtual Connections (PVCs) and ACS Frame Relay switching equipment. If the other frame relay service network's switch or facility is not in a location served by a Company serving wire center where an ACS FRS switch is located, private line transport charges will apply at rates set forth in the Digital Services Catalog. NNIT PVCs are provisioned at customer-selected Committed Information Rates (CIRs), and at port speeds, dependent upon the customer's data networking requirements. Detailed CIR information is set forth in technical publications listed in this Catalog under Reference to Technical Publications.

NNIT provides bi-directional polling between the ACS FRS Network and another frame relay service network.

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5.1 DESCRIPTION

5.1.2 SERVICE ELEMENTS (CONT'D)

H. Permanent Virtual Connection (PVC)

A PVC is a unidirectional, logical channel from one Frame Relay Port to another Frame Relay Port within the ACS Network. PVCs are provisioned, at customer-selected port speeds, with customer-selected Committed Information Rates (CIRs), depending on the customer's data network requirements.

Although higher numbers of PVCs may be provided, depending on an individual customer's traffic characteristics, the following are the recommended maximum numbers of PVCs for designated FRS port speeds:

FRS PORT SPEEDS	RECOMMENDED NUMBER OF PVCs	(T)
56 or 64 kbps	30	
112 or 128 kbps	40	
224 or 256 kbps	80	
336 or 384 kbps	120	
448 or 512 kbps	125	
672 or 768 kbps	125	
1.544 Mbps	125	
44.736 Mbps	[1]	

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[1] The maximum number of PVCs, which may be associated with 44.736 Mbps FRS, is 500. (T)

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5.1 DESCRIPTION

5.1.2 SERVICE ELEMENTS

I. Central Office Connecting Channel (COCC)

When a customer accesses FRS via a private line transport facility which requires multiplexing to be compatible with FRS transmission speeds or requires port to port connectivity, the COCC provides the ongoing interconnection from the multiplexer or other facility port to an FRS port.

An FRS Level One COCC provides connectivity at speeds up to 1.544 Mbps.
An FRS Level Two COCC provides connectivity at speeds up to 44.736 Mbps.

5. FRAME RELAY SERVICE

5.1 DESCRIPTION (CONT'D)

5.1.3 OPTIONAL FEATURES AND FUNCTIONS

Customer Network Management

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The Customer Network Management (CNM) feature provides the customer with read-only access to information related to service faults, usage and Frame Relay Service configurations. Utilizing Simple Network Management Protocol (SNMP), customer-provided network management workstations access CNM and receive solicited and unsolicited service information. CNM includes a PVC which is dedicated to the feature. This CNM-dedicated PVC does not affect the total number of PVCs available to the customer per port. The furnishing of Customer Network Management requires certain technical capabilities of the Frame Relay switch and is therefore available only where switches are so equipped.

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5.2 GENERAL TERMS AND CONDITIONS

In addition to the terms and conditions in Section 2 and Section 3 of this Catalog, the terms and conditions in this section also apply for Frame Relay Service.

5.2.1 OBLIGATIONS OF THE CUSTOMER

Error correction is the responsibility of the customer's Frame Relay-compatible terminal equipment. FRS nodes may discard frames with errors and may discard frames when the network supporting FRS is in a state of congestion. Congestion control and recovery mechanisms are as set forth in technical documents listed in this Catalog under Reference to Technical Publications.

5.3 RATE TERMS AND CONDITIONS

- A. FRS may be ordered on a month-to-month basis or for fixed periods of one, two, three, four, five, six or seven years. Pricing plans are further described in 2.4.5. (T)
(C-M)
- B. A subsequent order to add FRS Access Link(s) to an existing fixed-period service pricing plan must be for one of the fixed-periods specified in A., preceding, or for the remainder of the existing fixed-period service pricing plan, provided the remainder of the existing plan is at least the minimum period for that plan. If the remaining term is less than the associated minimum period, the minimum term for the added Access Link(s) shall be the associated minimum period.

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5. FRAME RELAY SERVICE

5.3 RATE TERMS AND CONDITIONS (CONT'D)

- C. An FRS Access Link is available as a component of FRS or as a stand-alone offering. When a stand-alone Access Link is ordered, transport mileage may apply, at rates set forth in the Private Line Transport Catalog. (T)
- D. A customer may access 56 kbps through 1.544 Mbps FRS via an FRS Access Link or via Company-provided, digital, private line facilities. When a customer's serving wire center is not an FRS Service Point, the customer may utilize a combination of an FRS Access Link and Company-provided, digital, private line transport facilities to reach the nearest FRS Service Point. If a customer utilizes private line facilities, or private line transport with an FRS Access Link, to access FRS, the associated regulations, rates and charges for such private line facilities shall apply in addition to the rates and charges associated with the Frame Relay service elements. (T)

Company-provided, private line transport facilities or other compatible facilities provided by another company, which has a point-of-presence in the Company central office from which FRS is provided, must be used to access 44.736 Mbps FRS.

A customer utilizing private line facilities to access FRS would not incur a nonrecurring charge or monthly rate for a Frame Relay Access Link, but would incur all other monthly rates and nonrecurring charges normally associated with the ordering, installation and provisioning of FRS, as set forth in 5.4.

- E. When a customer orders a Frame Relay PVC or Customer Network Management (CNM) after Frame Relay Service (FRS) is established, or a customer orders a change to an established FRS PVC assignment or Committed Information Rate, a nonrecurring, subsequent order charge applies in addition to the nonrecurring charge for the element or feature ordered or changed. However, when FRS PVCs or CNM are ordered or changed on the same customer service configuration at the same time, only one subsequent order charge applies. (C)

5. FRAME RELAY SERVICE

5.4 RATE ELEMENTS

5.4.1 GENERAL

A. Access Link

A nonrecurring charge and monthly rate, both based on the speed of the Access Link, e.g. 56/64 kbps or 1.544 Mbps, apply per Access Link for each physical connection to the ACS FRS Network.

B. Stand-Alone Access Link

A nonrecurring charge and a monthly rate, based on the speed of the Stand-Alone Access Link, apply per Stand-Alone Access Link for the physical connection between a customer's facilities and a frame relay service network provided by a service provider other than the Company. In addition to this rate element, Transport Mileage may apply, at rates set forth in the Digital Services Catalog.

C. Information Transfer (UNIT or NNIT)

A monthly rate, based on the speed of the port and the number of PVCs assigned to the port, applies per port for each FRS Access Link or digital private line connection to the network supporting FRS. A "First PVC" nonrecurring charge applies for the first unidirectional PVC ordered on an FRS Port. An "Each Additional PVC" nonrecurring charge applies for each additional unidirectional PVC ordered on the same FRS Port as the first PVC. For subsequent installations (order request after initial installations), a subsequent nonrecurring order charge applies, in addition to the "Each Additional PVC" nonrecurring charge, when PVCs are added, PVC assignments are changed, or CIR is changed on an existing PVC. In addition, private line transport charges may apply for NNIT, as set forth in 5.1.2.G.

D. Central Office Connecting Channel (COCC)

A nonrecurring charge and a monthly rate apply per COCC.

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5. FRAME RELAY SERVICE

5.4 RATE ELEMENTS (CONT'D)

5.4.2 OPTIONAL FEATURES AND FUNCTIONS

A. Customer Network Management (CNM)

A nonrecurring charge and a monthly rate apply per customer-provided network management workstation which accesses CNM.

B. Subsequent Customer Network Management Order

A nonrecurring charge applies per order to add Customer Network Management or to add access of a customer-provided network management workstation to an existing Frame Relay Service. This charge applies in addition to the nonrecurring charge associated with the Customer Network Management feature.

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5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES (CONT'D)

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5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES

5.5.1 GENERAL

A. Access Link

	USOC	NONRECURRING CHARGE	MONTHLY RATE
1. 56 or 64 kbps (Intraexchange), per Access Link			
• Month-to-Month	L7AXM	\$450.00	\$66.75 (I)
• 1-Year	L7AX1	450.00	64.75
• 2-Year	L7AX2	450.00	63.50
• 3-Year	L7AX3	450.00	60.00
• 4-Year	L7AX4	450.00	60.00
• 5-Year	L7AX5	450.00	60.00
• 6-Year	L7AX6	450.00	60.00
• 7-Year	L7AX7	450.00	60.00 (I)
2. 1.544 Mbps, per Access Link			
• Month-to-Month	L7AXM	600.00	150.00
• 1-Year	L7AX1	600.00	142.50
• 2-Year	L7AX2	600.00	140.63
• 3-Year	L7AX3	600.00	138.75
• 4-Year	L7AX4	600.00	136.88
• 5-Year	L7AX5	600.00	135.00
• 6-Year	L7AX6	600.00	135.00
• 7-Year	L7AX7	600.00	135.00

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5.5 RATES AND CHARGES
5.5.1 GENERAL (CONT'D)

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5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES

5.5.1 GENERAL (CONT'D)

B. Stand-Alone Access Link

	USOC	NONRECURRING CHARGE	MONTHLY RATE
1. 56 or 64 kbps (Intraexchange), per Access Link			
• Month-to-Month	NNLXM	\$450.00	\$66.75 (I)
• 1-Year	NNLX1	450.00	64.75
• 2-Year	NNLX2	450.00	63.50
• 3-Year	NNLX3	450.00	60.00
• 4-Year	NNLX4	450.00	60.00
• 5-Year	NNLX5	450.00	60.00
• 6-Year	NNLX6	450.00	60.00
• 7-Year	NNLX7	450.00	60.00 (I)

5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES

5.5.1 GENERAL

B. Stand-Alone Access Link (Cont'd)

	USOC	NONRECURRING CHARGE	MONTHLY RATE	(D)
2. 1.544 Mbps, per Access Link				(T)
• Month-to-Month	NNLXM	\$600.00	\$150.00	
• 1-Year	NNLX1	600.00	142.50	
• 2-Year	NNLX2	600.00	140.63	
• 3-Year	NNLX3	600.00	138.75	
• 4-Year	NNLX4	600.00	136.88	
• 5-Year	NNLX5	600.00	135.00	
• 6-Year	NNLX6	600.00	135.00	
• 7-Year	NNLX7	600.00	135.00	

5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES

5.5.1 GENERAL (CONT'D)

C. User-To-Network Information Transfer (UNIT)

1. 56 (Intraexchange) or 64 kbps - UNIT

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	USOC	NONRECURRING CHARGE
• First PVC	NRBF1	\$50.00
• Each additional PVC	NRBF2	20.00
• Subsequent PVC(s) order charge, per order[1]	NRBFO	75.00

	MONTHLY RATES			
	MONTH-TO-MONTH USOC	RATE	1-YEAR USOC	RATE
• Per port with:				
1 PVC	17TAM	\$ 55.56	17TA1	\$ 52.78
2 PVCs	17TBM	113.63	17TB1	107.95
3 PVCs	17TCM	148.92	17TC1	141.47
4 PVCs	17TDM	177.39	17TD1	168.52
5 PVCs	17TEM	202.43	17TE1	192.31
6 through 14 PVCs[2]	17TGM	6.26	17TG1	5.95
15 through 24 PVCs[3]	17THM	3.13	17TH1	2.97
Each additional PVC over 24[4]	17TJM	1.56	17TJ1	1.48

[1] When appropriate, the "Each Additional PVC" nonrecurring charge applies in addition to the "Subsequent PVC Order Charge".

[2] For each PVC over 5, up to and including 14, add this rate to the monthly rate for 5 PVCs.

[3] For each PVC over 14, up to and including 24, add this rate to the total monthly rate for 14 PVCs.

[4] For each PVC over 24 add this rate to the total monthly rate for 24 PVCs.

5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES

5.5.1 GENERAL

C. User-To-Network Information Transfer (UNIT)

1. 56 (Intraexchange) or 64 kbps - UNIT (Cont'd) (T)

MONTHLY RATES

	2-YEAR		3-YEAR		
	USOC	RATE	USOC	RATE	

- Per port with:

1 PVC	17TA2	\$ 52.09	17TA3	\$ 51.39	
2 PVCs	17TB2	106.53	17TB3	105.11	
3 PVCs	17TC2	139.61	17TC3	137.75	
4 PVCs	17TD2	166.30	17TD3	164.09	
5 PVCs	17TE2	189.78	17TE3	187.25	
6 through 14 PVCs[1]	17TG2	5.87	17TG3	5.79	
15 through 24 PVCs[2]	17TH2	2.93	17TH3	2.90	
Each additional PVC over 24[3]	17TJ2	1.46	17TJ3	1.44	(D)

[1] For each PVC over 5, up to and including 14, add this rate to the monthly rate for 5 PVCs.

[2] For each PVC over 14, up to and including 24, add this rate to the total monthly rate for 14 PVCs.

[3] For each PVC over 24 add this rate to the total monthly rate for 24 PVCs.

5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES

5.5.1 GENERAL

- C. User-To-Network Information Transfer (UNIT)
1. 56 (Intraexchange) or 64 kbps - UNIT (Cont'd)

MONTHLY RATES				(T)
4-YEAR		5-YEAR		
USOC	RATE	USOC	RATE	

- Per port with:

1 PVC	17TA4	\$ 50.70	17TA5	\$ 50.00
2 PVCs	17TB4	103.69	17TB5	102.27
3 PVCs	17TC4	135.89	17TC5	134.03
4 PVCs	17TD4	161.87	17TD5	159.65
5 PVCs	17TE4	184.72	17TE5	182.19
6 through 14 PVCs[1]	17TG4	5.71	17TG5	5.63
15 through 24 PVCs[2]	17TH4	2.86	17TH5	2.83
Each additional PVC over 24[3]	17TJ4	1.42	17TJ5	1.40

[1] For each PVC over 5, up to and including 14, add this rate to the monthly rate for 5 PVCs.

[2] For each PVC over 14, up to and including 24, add this rate to the total monthly rate for 14 PVCs.

[3] For each PVC over 24 add this rate to the total monthly rate for 24 PVCs.

5. FRAME RELAY SERVICE

5.5 RATES AND CHARGES

5.5.1 GENERAL

C. User-To-Network Information Transfer (UNIT)

1. 56 (Intraexchange) or 64 kbps - UNIT (Cont'd) (T)

MONTHLY RATES

	6-YEAR		7-YEAR		
	USOC	RATE	USOC	RATE	(D)

- Per port with:

1 PVC	17TA6	\$ 50.00	17TA7	\$ 50.00	
2 PVCs	17TB6	102.27	17TB7	102.27	
3 PVCs	17TC6	134.03	17TC7	134.03	
4 PVCs	17TD6	159.65	17TD7	159.65	
5 PVCs	17TE6	182.19	17TE7	182.19	
6 through 14 PVCs[1]	17TG6	5.63	17TG7	5.63	
15 through 24 PVCs[2]	17TH6	2.83	17TH7	2.83	
Each additional PVC over 24[3]	17TJ6	1.40	17TJ7	1.40	

[1] For each PVC over 5, up to and including 14, add this rate to the monthly rate for 5 PVCs.

[2] For each PVC over 14, up to and including 24, add this rate to the total monthly rate for 14 PVCs.

[3] For each PVC over 24 add this rate to the total monthly rate for 24 PVCs.