

Network Disclosure Announcement No. 433

Public Notice of Network Change(s), Pursuant to CFR 47, subsections 51.325 - 51.335.
Qwest's Internet address: <http://www.qwest.com/disclosures>.

Modem Aggregation Service (MAS) Cancellation Update April 27, 2001

Original Disclosure Date: March 15, 1999
Update to Network Disclosure News # 433 dated April 27, 2001

Summary:

This disclosure announces the cancellation of the Qwest Modem Aggregation Service (MAS) effective May 1, 2001. Qwest will no longer make this service available to new customers or allow additions to existing customer's service. Existing service will be "grandfathered."

Previously this disclosure announced the availability of the Layer Two Tunneling Protocol (L2TP) interface, User Datagram Protocol (UDP) and IP Protocol in addition to the currently disclosed Frame Relay (*Network Disclosure Announcement No. #401*) and (ATM) Asynchronous Transfer Mode (*Network Disclosure Announcement No. #400*) cell relay user network interface (UNI).

These interfaces were used in conjunction with the Qwest "Modem Aggregation Service (MAS)." They were the interfaces provided to a Frame Relay or ATM end user who desired to connect to MAS.

For both Frame Relay and ATM customer network interfaces, the customer CPE must support an L2TP Tunnel Interface, UDP: User Datagram Protocol Specifications and IP Protocol.

**Locations and
Timing of Deployment:**

Locations where MAS is planned or currently available can be found in Attachment 1. In addition, any new deployment locations will be added to the Qwest web site at <http://www.qwest.com/disclosures> in disclosure #433.

Pricing:

The Qwest MAS Service using the L2TP interface was offered under tariff in the locations identified in Attachment 1 (see "Locations" above).

Interface Requirements: MAS Frame Relay Customer Network Interface:

At the Layer 1 (Physical Layer) level, the MAS Frame Relay Customer Network Interface consists of the following protocol:

At the physical layer, MAS supports all Frame Relay UNI Access Links (including 56 Kbps 4-wire, 64 Kbps 4-wire, 128 Kbps 2-wire, 1.544 Mbps (DS1), Fractional DS1, or 44.736 Mbps(DS3)) as defined in the Qwest Frame Relay Service Network Disclosure Announcement No. 401 at web location <http://www.qwest.com/disclosures>

For MAS service, one Frame Relay PVC is supported at the Customer Network Interface. On behalf of the MAS customer, the Frame Relay PVC carries all dial-in traffic for all end users within a calling area. The PVC originates within the MAS network.

MAS ATM Customer Network Interface :

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At the Layer 1 (Physical Layer) level, the MAS ATM Customer Network Interface consists of the following:

All ATM-CRS UNI Access Links (including DS1, DS3, or OC3) as defined in the Qwest ATM Cell Relay Service Network Disclosure Announcement No. 400 at web location <http://www.qwest.com/disclosures>

For MAS service, one ATM CRS Permanent Virtual Circuit (PVC) is supported at the Customer Network Interface. MAS uses the ATM UBR (Unspecified Bit Rate) Class of Service on the PVC. On behalf of the MAS customer, the ATM PVC carries all dial-in traffic for all end users within a calling area. The PVC originates within the MAS network (RAS network element).

MAS Layer 2 Option: IP Encapsulation Over Frame Relay

For MAS Layer 2 Frame Relay service interoperability, the customer CPE (LNS) must also conform to the following IETF standard IETF STD55 (RFC 2427), "Multiprotocol Interconnect Over Frame Relay". The following sections of this standard apply to MAS-CPE interoperability:

- Section 3 Frame Format;
 - Section 4.1 Routed Frames – Format of Routed IP Datagram (NLPID 0xCC);
 - Section 6 Fragmentation;
 - Section 8 IP over Frame Relay (both NLPID value indicating IP = 0xCC and NLPID value indicating SNAP where PID = 0x0800 (IP)).
- All other sections do not apply to MAS-CPE interoperability.

MAS Layer 2 Option: IP Encapsulation over ATM

For MAS Layer 2 ATM service interoperability, the customer CPE (LNS) must also conform to the following IETF Standard:

IETF RFC 2684, "Multiprotocol Encapsulation over ATM Adaptation Layer 5.", July 1993, Payload Format for Routed IP PDUs with OUI value 0x00-00-00 (PID = Ether Type) and Ether Type = 0x08-00 (IP PDU) (as specified in Section 3 AAL5 Frame Format and Section 4.1 LLC Encapsulation for Routed Protocols). All other sections of this standard do not apply to MAS-CPE interoperability.

MAS Layer 3 Interface: IP

For both MAS Frame Relay and MAS ATM customer network interfaces, the customer CPE must support the IP Version 4 protocol as specified in IETF STD0005 (RFC 791), "IP: Internet Protocol." The CPE must support the entire specification to be interoperable with MAS.

MAS Layer 4 Interface: L2TP Tunnel Type:

For both Frame Relay and ATM customer network interfaces, the customer CPE must support an L2TP Tunnel Interface.

The L2TP tunnels originate within the MAS network. The customer CPE (LNS) must support dynamic creation of multiple tunnels. CPE support for at least 8 tunnels per calling area is recommended to assure operation in any location where MAS is available. Smaller calling areas will need fewer tunnels than larger calling areas.

The Qwest MAS network elements initiate, within the network, L2TP-UDP formatted frames.

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The customer CPE (LNS) must support L2TP authentication as specified in section 5.1.1 of the L2TP specification.

For L2TP Tunnel Type MAS interoperability, the following IETF standards must be supported by the customer CPE (LNS): User Datagram Protocol and L2TP Protocol. See Technical Publication 77402 “Modem Aggreagtion Service” Issue B dated April 2000 for more information.

User Datagram Protocol

For MAS interoperability, the CPE must support the IETF User Datagram Protocol (RFC 768) standard.

L2TP Protocol

To be interoperable with MAS, the CPE must support the following L2TP specifications:

- Dynamic L2TP tunnel establishment from L2TP tunnels that originate within the MAS network. The tunnels do not originate from the dial-in user premise equipment.
- Have capacity to support the establishment of at least 8 tunnels per calling area served by the LNS.
- L2TP tunnel authentication with a “shared secret” that is made available with the MAS subscription. This “secret” is only known to the MAS customer and the Qwest MAS Customer Service Center.
- L2TP session establishment and encapsulation of multiple concurrent PPP user data streams. For each user call accepted there is a corresponding L2TP session establish.

L2TP Tunneling Protocol (IETF RFC 2661) standard compatible as qualified below:

- Section 2.0. The network between MAS and the LNS is Frame Relay or ATM.
- Section 4.3. Hiding of AVP Attribute Values. This section describes a method of indicating to a peer that the present value of an attribute value pair is hidden. MAS does not support the hiding of values of AVPs currently.
- Section 4.4.5. Proxy LCP and Authentication AVPs. This section describes Attribute Value Pairs (AVP) and methods for negotiating LCP and user authentication. MAS does partial LCP negotiations and forwards the result to the LNS. MAS does not forward the authentication (PAP or CHAP) to the LNS. The authentication is discarded, which causes the client to re-negotiate authentication with the customer LNS. There are no known incompatibilities with this method, as PPP is structured to re-negotiate this automatically. Note: This is not a consideration for compulsory tunneling based on Called or Calling Station ID.
- Section 5.2.2 Outgoing Call Establishment. MAS does not support Outgoing Call Establishment.
- Section 5.4 Using Sequence Numbers on the Data Channel. This section describes a method for enabling and disabling sequence numbers for the data channel. Sequence numbers are defined in the L2TP header for control messages and optionally for data messages (see Section 3.1). These are used to provide a reliable control message transport (see Section 5.4) and optional data message sequencing. MAS sends payload with sequence numbers, however, it will accept payload with or without sequence numbers.

Acronym Key

ATM	Asynchronous Transfer Mode
BRI	ISDN Basic Rate Interface
CPE	Customer Premise Equipment
CRS	Cell Relay Service
FR	Frame Relay
IETF	Internet Engineering Task Force

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IMT	Inter- Machine Trunk
IP	Internet Protocol, RFC 791
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
LAC	L2TP Access Concentrator
L2TP	IETF Layer 2 Tunneling Protocol
LNS	L2TP Network Server
MAS	U S WEST Modem Aggregation Service
PPP	Point to Point Protocol, RFC 1661
PRI	ISDN Primary Rate Interface
PSTN	Public Switched Telephone Network
PVC	Permanent Virtual Circuit
RAS	Remote Access Server
RFC	Request For Comment
TA	ISDN Terminal Adapter
UDP	User Datagram Protocol, RFC 768
UNI	User Network Interface

Additional Information: All IETF standards identified herein can be found at web location <http://www.rfc-editor.org/rfc.html>

The draft L2TP standard can be found at web location <http://www.ietf.org/>

Any customer premises equipment vendor/manufacturer or enhanced services provider wanting to offer products or services in conjunction with the MAS Interfaces may request additional information by contacting: - - -

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MAS is available in the following local calling areas. Specific Central Offices are identified in the Qwest Tariffs located at the following WEB site: <http://tariffs.qwest.com/>. This list is subject to change.

* An asterisk in the margin denotes a change or addition to the previous release.

<u>Free Calling Area</u>	<u>State</u>	<u>Locations Can be Found in the Tariffs Below</u>	<u>Availability Date</u>
Phoenix	AZ	Arizona Exchange and Network Services Tariff and Price List – 5. EXCHANGE SERVICES 5.1 EXCHANGE AREAS	04/10/00
Denver	CO	Colorado Exchange and Network Services Tariff and Price List – 5. EXCHANGE SERVICES 5.1 EXCHANGE AREAS	04/10/00
Minneapolis St. Paul	MN	Minnesota Exchange and Network Services Tariff – 5. EXCHANGE SERVICES 5.1 EXCHANGE AREAS	04/10/00
Portland	OR	Oregon Exchange and Network Services Tariff – 5. EXCHANGE SERVICES 5.1 EXCHANGE AREAS	04/10/00
Salt Lake City	UT	Utah Exchange and Network Services Tariff – 5. EXCHANGE SERVICES 5.1 EXCHANGE AREAS	04/10/00
Bremerton Seattle Silverdale Tacoma	WA	Washington Exchange and Network Services Tariff – 5. EXCHANGE SERVICES 5.1 EXCHANGE AREAS	04/10/00