

Ethernet Transport Service (ETS)

The Ethernet Transport Service (ETS) enables secure, high-speed transmission (10 Mbps to 100 or higher Gbps) of video, audio and data between different local, national and international agency locations. This flexible and cost-effective service can provide Intranet and intra-agency communications or Extranet and inter-agency communications. It can interconnect Local Area Networks (LANs) in a city, forming a Metro Area Network (MAN), or interconnect LANs and/or MANs in different cities or countries, forming a Wide Area Network (WAN).

ETS runs on a Multiprotocol Label Switching (MPLS) backbone, which ensures the required quality of video, audio and data communications. Point-to-point connections can also be provided by ETS over a self-healing Synchronous Optical Network (SONET).

The service is offered in two different versions:

- Ethernet Private Line (E-LINE): This is a point-to-point service with reserved bandwidth. (See *Figure 1* below.)
- Ethernet Private LAN (E-LAN): E-LAN supports both point-to-multipoint and multipoint-to-multipoint configurations. (See *Figure 2* below for multipoint-to-multipoint setup.)

Category: Data Services

Complementary Services Needed: In order to use ETS, an agency would need EIS Access Arrangements (AAs) or equivalent.

Definitions: Please see EIS contract [Section J.12 Glossary of Terms](#) for clarification of technical terms and acronyms.

Figure 1—Point-to-Point Configuration to Establish an Ethernet Private Line (E-LINE)

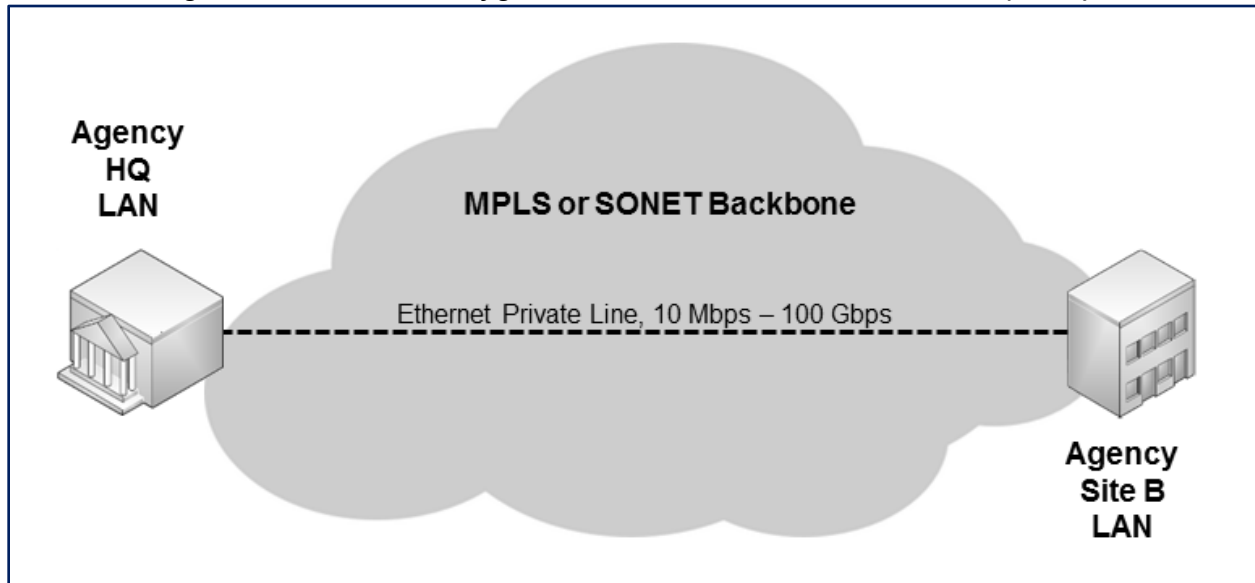
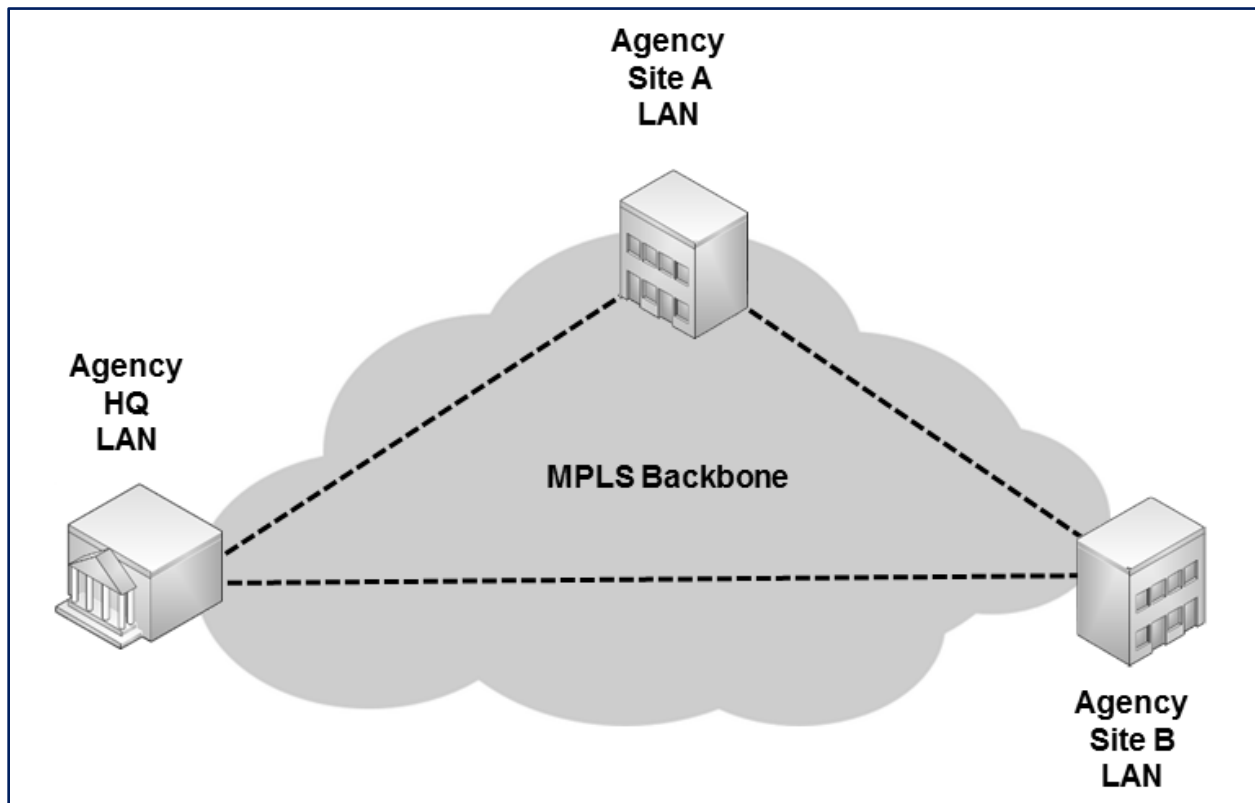


Figure 2—ETS E-LAN Service Configured for Multipoint-to-Multipoint Connections



1. Why an Agency Might Select this Service

- ETS is a flexible, managed service that can be easily re-configured to meet growing agency bandwidth and connection demands without expensive hardware upgrades.
- The service can accommodate a wide range of speeds from 10 Mbps up to 100 Gbps.
- ETS offers a high level of service quality formalized in advanced Service Level Agreements and Quality of Service guarantees. For example, it offers a Critical Service Level performance $\geq 99.99\%$.

2. Examples of how ETS Could be Used

ETS enables an agency to share its data, IT resources and communication services among agency sites, no matter where they are located. They could be in the same building, different buildings, or in other cities and countries. Here are two sample scenarios:

- **Reduction of Transport Costs:** An agency could use ETS to replace more expensive TDM T1/T3 lines.
- **Metro Area Network (MAN) or Wide Area Network (WAN):** ETS could be used in a multipoint-to-multipoint configuration to interconnect LANs in the same city to form a MAN, or LANs in different cities and/or countries to form a WAN. Such configurations could give agency personnel transparent access to the organization's combined information throughout a city, the country or the world.

3. Key Technical Specifications

NOTE:

(1) This portion of the service guide has been abridged due to space considerations. Please see EIS contract [Section C.2.1.2 Ethernet Transport Service](#) for full technical details on this service.

(2) ETS currently has no Features.

Table 1—ETS Technical Capabilities

Capability	Description
Applicable Routing Requirements	Ensuring any encrypted tunnels are applied and proxied to allow inspection as specified in Section C.1.8.8
Geographical Coverage	A seamless end-to-end service will be provided from the Service Delivery Point (SDP) Customer Premise Equipment (CPE) traversing the contractor's network for both: <ul style="list-style-type: none"> a) Intra-City ETS - In the same city inside the US (CONUS and Metro) and outside the US (OCONUS and Non-Domestic). b) Inter-City ETS - Domestic and non-domestic locations (CONUS/Metro, OCONUS/Non-Domestic) where commercially available.
Ethernet User-to-Network-Interfaces (UNIs)	Support Layer 2 and Layer 3 clients. Note: Layer 3 clients are agency devices that support Layer 3 protocol packets such as IPv4, IPv6.
Ethernet Virtual Connections (EVCs)	Support for EVCs as defined by the Metro Ethernet Forum.
ETS to Service Delivery Point (SDP)	Support delivery of ETS at the agency's Service Delivery Point (SDP) via a UNI.
ETS Circuit Emulation for TDM	ETS support of Circuit Emulation Services for TDM Services.
EVC Configuration	Point-to-Point, Multipoint-to-Multipoint, and Rooted Multipoint EVCs.
EVC Multiplexing	Support of multiplexing for EVCs.
Rate-Limited Throughput Access Links	Support of 1 Gbps port rate limited in 100 Mbps increments.
Rate Limiting @ SDP & VLAN	Support for rate-limiting at the agency's SDP and at the individual VLAN ingress and egress.

Capability	Description
Privacy and Security	Support for privacy and security will be supported per IEEE 802.3 as defined in the task order (TO).
Physical Interfaces	Are supported as listed in Section C.2.1.2.3.
Traffic Profiles	The following traffic profiles are supported: <ul style="list-style-type: none"> a) Committed Information Rate (CIR) b) Committed Burst Size (CBS) c) Peak Information Rate (PIR) d) Maximum Burst Size (MBS)
Performance Parameters	Will be supported as listed in Section C.2.1.2.4
Service Frame Delivery Options	The following SFD options are supported: <ul style="list-style-type: none"> a) Unicast Frame Delivery b) Multicast Frame Delivery, as per RFC 4604 c) Broadcast Frame Delivery as per IEEE 802.3
VLAN Tag	Supported VLAN Tag features include: <ul style="list-style-type: none"> a) VLAN tag preservation b) VLAN tag translation c) VLAN tag stacking d) VLAN aggregation across a common physical connection (NOTE: May not be available from all contractors.)
Service Multiplexing	Support includes multiple EVCs connected via a single UNI.
VLAN ID Bundling	Supports bundling to enable two or more VLAN IDs to be mapped into a single EVC at a UNI.
Security Filters	Are supported as specified in the TO.
Proactive Performance Monitoring (NOTE: May not be available from all contractors.)	The following Proactive Performance Monitoring are supported: <ul style="list-style-type: none"> a) Signal failure b) Signal degradation c) Connectivity or Loss of connectivity d) Frame loss e) Errored frames f) Looping g) Denial of service (DoS) h) Mis-inserted frames i) Maintenance parameters

Capability	Description
Maintenance Functions	The following Maintenance Functions are supported: <ul style="list-style-type: none"> a) Alarm suppression b) Loopbacks (intrusive and non-intrusive (transparent to on-going connections)) c) Protection switching, restoration, etc.
Network Topologies	The following Network Topologies are supported: <ul style="list-style-type: none"> a) Point-to-point b) Rooted Multipoint c) Multipoint-to-Multipoint (i.e., mesh)
Geographical Diversity Reliability	Support of geographical diversity to provide added reliability. An agency may buy a geographical diverse route from the same or a different contractor to serve as a protection path.
Bridging	Bridging is supported in compliance with IEEE 802.1Q (2014).
Virtual Connection Sizes	The following Virtual Connection Sizes are supported: <ul style="list-style-type: none"> a) For point-to-point Ethernet connections – up to 40 Gbps b) For multi-point-to-multi-point connections – up to 40 Gbps
Quality of Service (QoS)	Support of traffic prioritization that enables higher priority traffic to be transmitted first
Traffic Reconfiguration	Supports the ability to modify a specific service connection subsequent to the establishment of the connection. Changes to an established connection may include upgrade/downgrade of speeds that do not result in physical equipment changes

4. Pricing Basics for ETS

Please visit the [EIS Resources Listing](#) and locate the [Basic EIS Pricing Concepts Guide](#) to gain an understanding of EIS pricing fundamentals.

4.1 Access Arrangements

Appropriate access arrangements must be selected for each endpoint. The selected access arrangement connects the endpoint SDP to the Ethernet backbone network. Please visit the [EIS Resources Listing](#) and locate the [Access Arrangements Guide](#) for more detailed information.

4.2 Service Related Equipment (SRE)

- SRE must be chosen based on equipment required at each location. NOTE: SRE uses catalog-based pricing.
- Request that contractor provide pricing for any SRE that would be required, in addition to the agency’s existing infrastructure, to deliver the service.
- Please visit the [EIS Resources Listing](#) and locate the [Service Related Equipment Service Guide](#) for more detailed information.

4.3 ETS Price Components

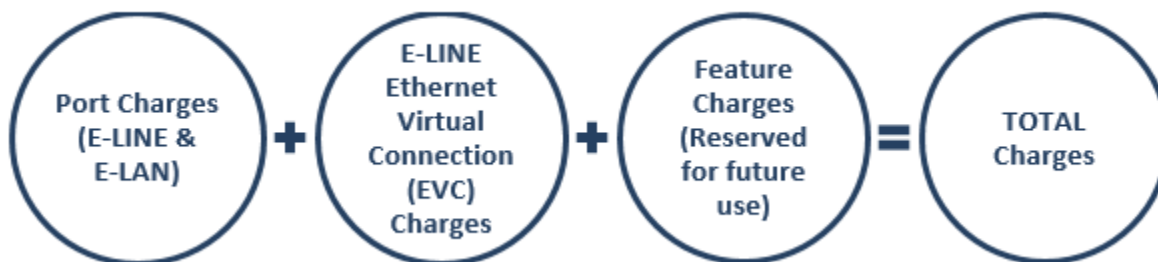
The price structure for ETS consists of the components shown in *Table 2* below.

Table 2—ETS Pricing Components

Component	Charging Unit
Port price	Port
Ethernet Virtual Connection (EVC) price (for E-LINE only)	EVC
Features (Reserved for future use. There are no features as of this writing.)	N/A

Figure 3 below shows how the pricing components in *Table 2* are combined to produce the total cost for the service.

Figure 3—This figure shows how the various pricing components in Table 2 would be combined to calculate the total ETS charges. NOTE: One or more of these components may not be needed to price a particular service package.



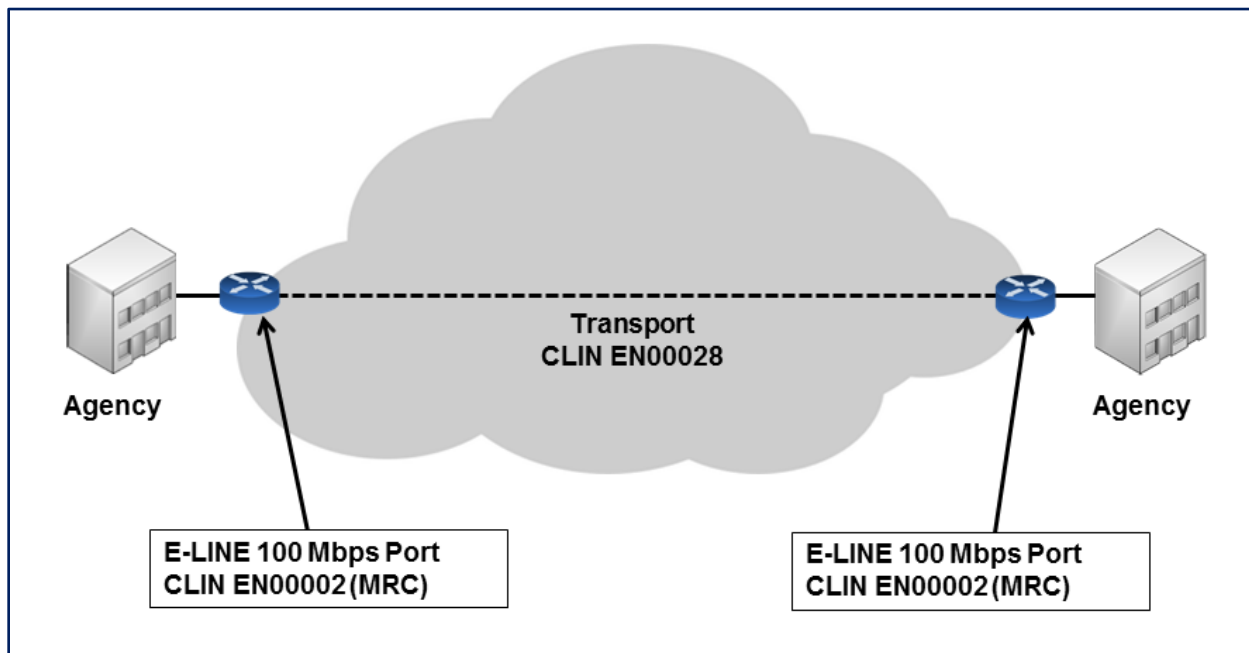
The charges for the different components in *Figure 3* are calculated using details provided in the pricing tables in EIS contract [Section B.2.1.2 Ethernet Transport Service](#). (Please visit the [EIS Resources Listing](#) and locate the [Basic EIS Pricing Concepts Guide](#) for instructions on using the pricing tables to compute the cost of a service.)

NOTE: A contractor may offer a custom variation of the service to meet an agency's unique requirements. Such a customization would be identified with a Task Order Unique CLIN (TUC), and would include charges that would have to be added to the components in *Figure 3* to determine the total cost of the service.

4.4 ETS Pricing Examples

Example 1: 100 Mbps E-LINE Connection

Figure 4—Ethernet Transport Service with E-LINE Option

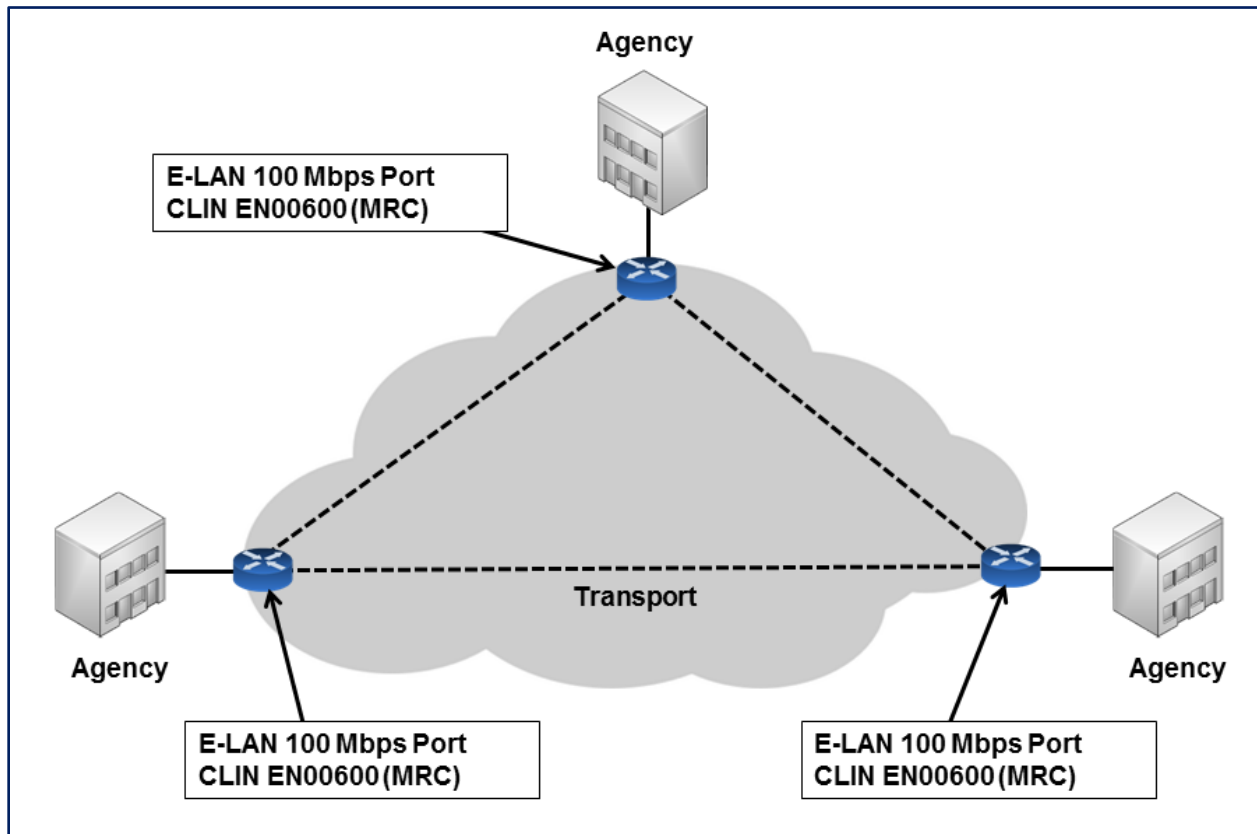


Service CLINs

- Choose CLIN EN00002 “E-LINE Ethernet Network Interface – 100 Mbps” (see EIS contract table B.2.1.2.2.2— *E-LINE Port Pricing Instructions Table*).
- Choose CLIN EN00028 “E-LINE EVC - 100 Mbps (point-to-point)– 100 Mbps”(see EIS contract table B.2.1.2.3.2— *E-LINE EVC Pricing Instructions Table*).

Example 2: 100 Mbps E-LAN Connection

Figure 5—Ethernet Transport Service with E-LAN Option

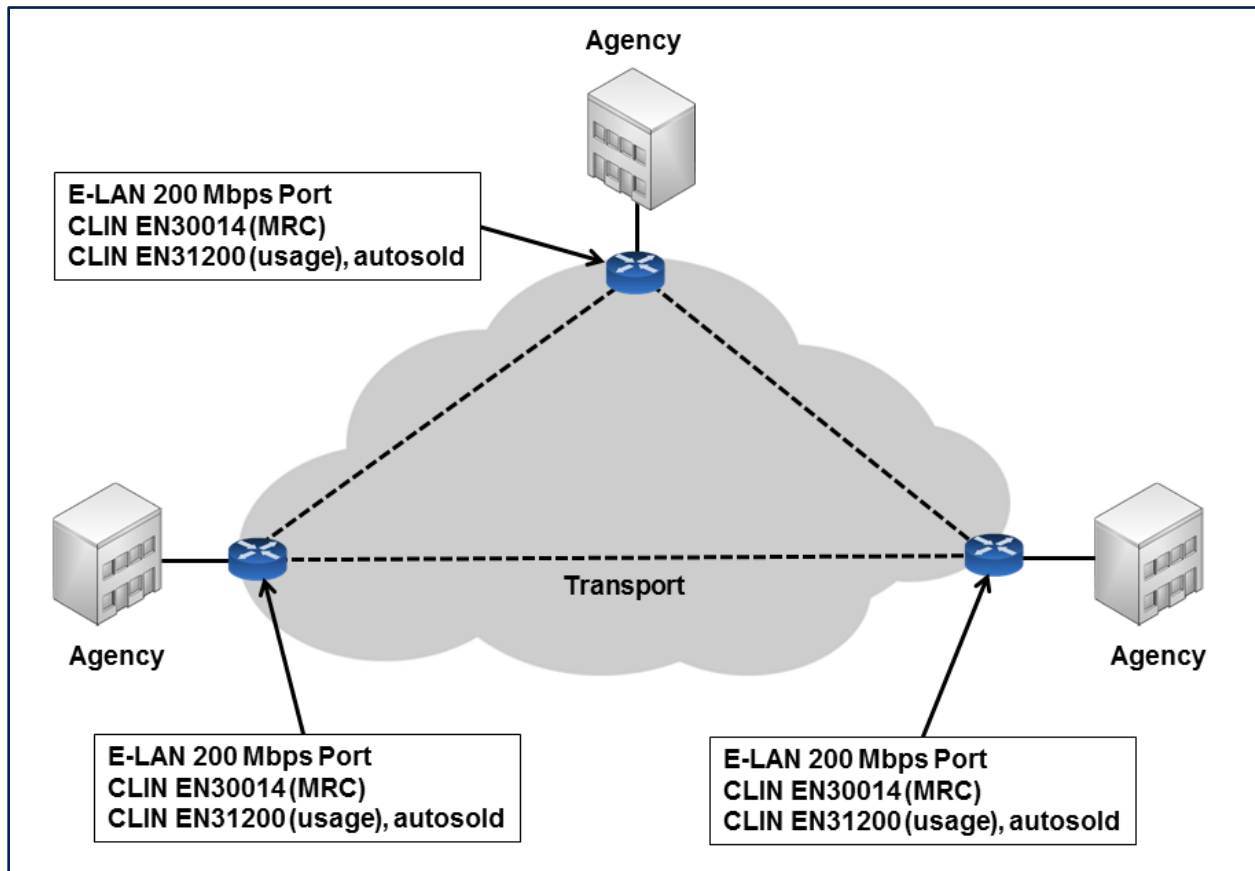


Service CLIN

- Choose CLIN EN00600 “E-LAN Ethernet – 100 Mbps” (see EIS contract table B.2.1.2.4.2—*E-LAN Port Pricing Instructions Table*).
- NOTE: (1) For this example, three ports will be needed; (2) There is no separate EVC charge.

Example 3: 200 Mbps E-LAN Connection Burstable to 1 Gbps

Figure 6—Ethernet Transport Service with the 200 Mbps Committed to 1 Gbps Burstable E-LAN Option



Service CLIN

- Choose CLIN EN30014 “E-LAN Ethernet – 200 Mbps committed, burstable to 1 Gbps” (see EIS contract table B.2.1.2.4.2— *E-LAN Port Pricing Instructions Table*).
- NOTE: (1) For this example, three ports will be needed; (2) There is no separate EVC charge; (3) CLIN EN31200, “E-LAN Ethernet burstable overage for 200 Mbps committed port burstable to 1 Gbps) will be autosold.



5. References and Other Sources of Information

- For more technical details and information on ETS, please refer to EIS contract [Section C.2.1.2](#); for pricing details, [Section B.2.1.2](#).
- For more information on service-related items, please see:
 - EIS contract [Section B.2.10 Service Related Equipment](#)
 - EIS contract [Section B.2.11 Service Related Labor](#)
- Please refer to a contractor's individual EIS contract for specifics on the contractor's ETS offerings.
- For additional EIS information and tools, visit the [EIS Resources Listing](#).
- For guidance on transitioning to EIS, please visit [EIS Transition Training](#) where you'll find several brief video training modules.