

Wide Area Ethernet

Issue Summary

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Ethernet has long been the technological choice for Local Area Networks (LAN) and is well recognized in the Information Technology (IT) segment as a mature and stable technology. However, as Ethernet-based technologies and services are expanded beyond their widely deployed "local area" confines to a regional or national network, additional complexities and challenges are introduced. It is in this space of Wide Area Ethernet (WAE) that the communications industry and its standards developers need to define technical standards and operating procedures to ensure interoperability across an already established, diverse, and competitive communications network.

The ATIS Technology and Operations (TOPS) Council established a Wide Area Ethernet focus group to create an industry technical work plan designed to identify needed standardization efforts pertaining to WAE. The ATIS WAE Work Plan will be completed and released in 4Q 2004.

Work Plan Recommendations

The objective of the ATIS TOPS Council WAE Work Plan is to standardize a complete networking solution that introduces globally consistent WAE services that are interoperable across service provider boundaries. Such services would be supported over a wide variety of access technologies including broadband digital subscriber loops using copper twisted pairs, hybrid fiber-coax links, wireless access links, and optical fiber access links. In developing the WAE Work Plan, the following key considerations and observations were made by the WAE focus group:

- Ethernet services will play an important role in access, regional, national and global networks and provide a cost-effective, flexible, bandwidth-scalable and simple to manage solution for customer access and aggregation for higher layer services.
- Ethernet virtual private network services will support point-to-point and multipoint-to-multipoint transparent Local Area Network (LAN) interconnection applications for businesses, governments, and educational institutions.
- Ethernet virtual private lines and dedicated private lines will also play an important role in wholesale carrier services and enterprise Wide Area Networks (WANs).
- The primary advantages of Ethernet services' are expected to be their cost-effectiveness, their simplicity from a carrier operations perspective, their simplicity from a customer management perspective, and the ease with which carriers can achieve service interoperability. It is important that we balance our desire to make Ethernet ideal for all applications with the need to keep it a simple and economic networking solution for an appropriate set of applications.
- Maintaining interoperability at the customer interface with currently standardized Ethernet is essential to the success of Ethernet services, as this provides an enormous embedded base of customer premises equipment.
- While Ethernet is a mature technology in many respects, additions are needed to create services that can support important new applications, such as voice and video, and to allow service providers to manage large-scale networks in a highly-automated manner. Each requirement can be met in a variety of ways, but it is critical to the interoperability of the end-to-end service that the industry reaches agreement on the needed enhancements.

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The ATIS WAE Work Plan provides assessments and outlines standardization efforts regarding the following issues:

- **Service Model/Definition for Ethernet Service:** Industry unification is needed for a consistent vision of Ethernet services, with a commitment to advance their introduction. While some carriers may use an Ethernet physical layer for handoff between service providers, it is anticipated that the service providers' hand-offs will more likely involve Generic Framing procedure (GFP) encapsulated Ethernet over a Synchronous Optical Network/Synchronous Digital Hierarchy (SONET/SDH) physical layer, so work to adopt a standard usage of these protocols for service provider hand-offs is important.
- **Service Parameters & Standards:** There must be selection of a small number of distinct Ethernet service classes, identification of performance parameters associated with those service classes, and the formulation of associated measurement techniques.
- **Operations, Administration, and Maintenance (OAM) Technical Support:** The industry must define mechanisms – where they are lacking – for link management, failure notifications, and fault localization. It must choose one or a small number of protection mechanisms to ensure service survivability across service provider boundaries.
- **Network Scalability:** The industry must endorse and strongly support completion of work in the following three areas:
 - Ethernet transport over SONET/SDH;
 - Provider Bridges standard; and
 - Work on the VPSL standard.
- **Ethernet Product Component and Connectivity Standards:** The industry must define an interface standard for an Ethernet customer-network interface. It must formulate equipment requirements needed to ensure the ability of service providers to support Ethernet services.
- **Interoperability:** The industry must accelerate the introduction of true interoperability through the creation of interoperability test specifications and by encouraging interoperability testing among equipment vendors and service providers.
- **Ordering, Billing and Provisioning:** The industry must formulate methods to automate the ordering, provisioning, and billing of Ethernet services across service provider boundaries.

Work Plan Status

The WAE Work Plan was publicly announced in 4Q2004. Copies of the WAE Work Plan were distributed within ATIS committees that will facilitate completion of standardization activities outlined in the plan. Additionally, for collaborative purposes, work plan details were shared with various standards bodies external to ATIS that are engaged in WAE standardization activities identified within the work plan. Copies of the ATIS Work Plan for WAE are available to ATIS member companies.

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