

ATIS IPv6 Task Force

June 2007

Overview

As the deployment of Internet Protocol version 6 (IPv6) increases internationally, the ATIS Technology and Operations (TOPS) Council agreed that the industry — as represented by ATIS member companies — would be well served by assessing the various aspects of IPv6 and communicating a consensus view on aspects of deployment, transition, and drivers. To reach this goal, the TOPS Council commissioned the ATIS IPv6 Task Force in September 2005 to assess the various aspects of IPv6, such as key drivers behind the transition to IPv6, and the impacts a transition will likely have on the existing Internet Protocol version 4 (IPv4) infrastructure. In May 2006, the IPv6 Task Force completed its first analysis, which resulted in the ATIS Internet Protocol version 6 (IPv6) Report & Recommendation (May 2006). The Task Force initiated a second phase of work to provide further detailed analysis on the priority areas defined in its initial report and to ensure the standards and business drivers needed to support the transition to IPv6 are known and met. This second phase resulted in the ATIS Internet Protocol version 6 (IPv6) Task Force Report on Transition Challenges (June 2007).

IPv6 Report and Recommendations

In its initial phase, the IPv6 Task Force examined and assessed an ATIS position that considers the transition to IPv6 from IPv4; the issues and complexities and mechanisms that may be raised by and provide solutions to the transition; interoperability of networking equipment; and other significant aspects of IPv6 such as security, addressing, and business drivers. While various organizational-specific factors will drive the pace at which networks are transitioned, it is generally accepted that industry's transition to IPv6 is a matter of when, not if. The recommendation includes direction on IPv6 transition mechanisms and deployment strategy. At a high level, the ATIS Internet Protocol version 6 (IPv6) Report & Recommendation presents the following:

Drivers / Reasons for Transition

- Business Factors (Large Enterprises, Residential, Networking)
- Technology Factors (Wireless Internet Applications, IPv6 Specific Applications and Services, Machine-to-Machine (M2M) applications, IPv6 Mobility, IMS)
- Depletion of IPv4 Addresses
- U.S. Government Direction
- Interoperable Global Communications
- Mergers & Acquisitions

Transition Technologies

- Dual-Stack
- IPv6 over IPv4 Tunneling (6to4 Tunneling, Intra-Site Automatic Tunnel Addressing Protocol (ISATAP), TEREDO, Tunnel Setup Protocol (TSP) and Tunnel Broker, 6PE)



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Deployment Challenges

- Security (Security Issues around 6to4: RFC 3964, NAT Gateways)
- Product Availability and Interoperability (Host & Clients, Other Network Equipment)
- Cost
- Quality of Service (QoS)
- Operations Support Systems (OSS)
- Coexistence with IPv4
- Site Multi-Homing
- SHIM6
- Dual-Stack with DNS
- Privacy Issues/Legal Challenges
- Address Allocation Policies
- Impact on Services, Infrastructure Reliability, Traffic Routing, Access Networks, and IP Settlement
- Partitioned Internet

Report on IPv6 Transition Challenges

In its second phase, the IPv6 Task Force has further examined the issues affecting IPv6 deployment and transition identified in its first report. The analysis includes the identification of standards and initiatives in standards development in the area of IPv6 which will enable transition to take place in a secure, logical manner fitting with the needs of vendors and network operators to provide solutions and best practices. The report provides a definition of requirements and problems, identification of standards work, and where possible an agreement and recommendation on actions needed in order to settle outstanding issues for the following:

- Address Allocation Policies
- Multi-Homing
- Security
- Network Address Translation
- QoS
- Interoperability
- Impacts on Traffic and Routing
- Management Tools
- Interoperability between IPv4 and IPv6
- Privacy Issues
- Impact to Access Networks (Operating at Layer 3)
- Network Renumbering
- Relationship to Other Numbering Systems
- Cost
- Impacts to Billing/Accounting
- Separation of Locator and Identifier
- Vendor Availability



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