

Network Working Group
Request for Comments: 1673
Category: Informational

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EPRI
August 1994

Electric Power Research Institute Comments on IPng

Status of this Memo

This memo provides information for the Internet community. This memo does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

Abstract

This document was submitted to the IETF IPng area in response to RFC 1550. Publication of this document does not imply acceptance by the IPng area of any ideas expressed within. Comments should be submitted to the big-internet@munari.oz.au mailing list.

Executive Summary

The question of the future of the Internet protocol (IP) is an issue of national if not international concern. It is critical to the building of a National Information Infrastructure, comparable to the adoption of basic standards for the industrial era such as railways, highways and electricity.

The Electric Power Research Institute (EPRI) is a non-profit organization, with 700 voluntary utility members, managing a technical research and development program for the electric utility industry to improve power production, distribution and use. The electric power industry is a major user of computing and communications and is fully committed to open systems.

While the industry is today a heavy user of the Internet Protocol Suite (IPS) it is following a long term strategy based on international standards developed by ISO and CCITT and national standards developed by the IEEE, ANSI and other standards bodies that employ formal review and voting procedures.

This strategy is based on a survey of needs in all aspects of the electrical power supply enterprise. It concluded that these needs are met more effectively by the current suite of OSI protocols and international standards under development. Therefore, EPRI developed the Utility Communications Architecture (UCA) specification for communications and the Database Access Integrated Services specification for data exchange both based on the OSI model and

international standards.

These specifications have been incorporated into the Industry Government Open Systems Specification (IGOSS). They are receiving favorable response and application by the industry and its suppliers as well as the support of the natural gas and waterworks industries.

The issues facing the Internet community concerning growth and the address and routing limitations of IP in particular, provide an ideal opportunity for creating the national uniform information transport superhighway. This is critical to the NII Agenda and the only proposal that will achieve this goal is one that is acceptable from both private and public sector viewpoints with both a national and an international perspective.

EPRI also believes it is critically important that new requirements need to be achieved by convergence of efforts to develop additional standards. Security, directory services, network management, and the ability to support real-time applications are four examples of where new convergent standards efforts are required.

Just as society could not in the past accept multiple standards for the gauge of the nation's railways, we can no longer accept multiple standards for information transport.

Engineering Considerations

1. Mandatory Requirement.

Inter networking must evolve to provide an industrial strength computing and communications environment for multiple uses of globally connected network resources. Specifically the underlying transport must provide high integrity support for upper layer industrial OSI applications including but not limited to MMS and TP. Use of interface layers such as RFC 1006 is not acceptable except as a transition strategy.

2. Basic Requirements.

- Scaleability

The addressing scheme must have essentially an unlimited address space to encompass an arbitrarily large number of information objects. Specifically it must solve the fundamental limitations of 32 bit formats, a format for 20 octets and above is considered suitable.

- Routing table economy
Network addressing must achieve significant economy in routing database size with very large networks.
- Support for the existing Internet
The existing internetworking paradigm and existing OSI and IPS applications are to be supported.

3. Key Engineering Considerations - A pragmatic solution.

- Available now
The solution must be available now using mature, internationally agreed standards and off-the-shelf implementations for hosts and routers. The solution must leverage existing investments in standards development, deployment and experience while at the same time provide for all basic requirements.
- Ease of Transition
Any solution must provide an evolutionary transition path using an OSI.
- IP dual network layer strategy.
This must be achievable without modifications to existing inter-domain routing protocols while providing the ability to support proprietary protocols such as IPX and Appletalk. The scheme must provide the ability to encompass other addressing schemes such as X.121 and E.164. Existing SNMP and CMIP MIBs must be applicable and available. Internet domain names need to be retained.
- Routing effectiveness
This key objective requires features such as route aggregation, service selection, and low frequency host advertisements; host routing intelligence should not be required.
- Flexible Efficient Administration
Operational needs will need to be met in an economic and flexible manner. Addressing allocations can be either geographically based or based on carrier ID or both and will be administered by policy not network topology. Simplified and robust configurability is required which includes the ability to identify resources e.g., multi-homed hosts and applications, instead of interfaces.
- Mobility
Dynamic addressing is required where hosts have the ability to learn their own network address with the minimum of human intervention.

Security Considerations

Security issues are not discussed in this memo.

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