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Input to IPng Engineering Considerations

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@munnari.oz.au mailing list.

Summary

This white paper expresses some personal opinions on IPng engineering considerations, based on experience with DECnet Phase V transition. It suggests breaking down the IPng decisions and transition tasks into smaller parts so they can be tackled early by the relevant experts.

Timescales

In order to allow key decisions to be taken early, I would like to see IPng decisions and timescales broken down into into smaller parts, for example:

- address structure and allocation mechanism
- name service changes
- host software and programming interface changes
- routing protocol changes

Although interrelated, not all details need to be defined by the same date. Identify which decisions will be hard to change and which can be allowed to evolve. All changes should be worked on in parallel, but the above list indicates a feeling for urgency of a decision. Our experience has been that administrative changes (as may be required for addressing changes) need the greatest elapse time for implementation, whereas routing protocol changes need the least.

I would like to see an early decision on address structure and enough information for service managers to start planning their transition. Some hosts will never be upgraded and will need to be phased out or configured with reduced connectivity. A lead time of 10 years (or more) will help to take good long term technical decisions and ease financial and organisational constraints.

Transition and deployment

Transition requires intimate knowledge of the environment (financial, political as well as technical). The task needs to be broken down so that service managers close to their clients can take decisions and make them happen.

Let the service managers adapt the solutions for their environment by providing them with a transition toolbox and scenarios of their uses based on real examples. Clearly state the merits and limitations of different transition strategies.

Provide for transition autonomy. Let systems and sites transition at different times, as convenient for them.

Identify what software needs to be changed and keep an up-to-date list.

Identify what is essential to have in place so that service managers can transition at their own pace.

Allow for a feedback loop to improve software based on experience.

Configuration, Administration, Operation

We run IP on a wide range of equipment and operating systems. We need an easy way to (re-)configure all our IP capable systems. The systems need to be sent their IP parameters (e.g., their address, address of their default router, address of their local name servers) and we need to obtain data from the system (e.g., contact information for owner, location and name of system). We also need an easy way to update DNS.

In our environment systems are regularly moved between buildings and we therefore find the tight coupling of IP address to physical subnet over restrictive. Automatic configuration could help overcome this.

We would like to efficiently load balance users of various IP based services (e.g., telnet, ftp, locally written applications) across a number of systems.

The ability to break down addresses and routing into several levels of hierarchy is important to allow the delegation of network management into subdomains. As the network grows so does the desire to increase the number of levels of hierarchy.

Disclaimer and acknowledgments

This is a personal view and does not necessarily represent that of my employer. I have benefited from many transition discussions with my colleagues at CERN, other High Energy Physics DECnet managers and Digital Equipment Corporation engineers.

Security Considerations

Security issues are not discussed in this memo.

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