Transition and Coexistence including Testing BOF

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TACIT Bof

- Objective
  - -Explore basic deployment issues of new internet technology onto the established Internet

Potential Outcomes (within IPng Process)

- Requirements for Transition Plans
- Review Transition Plans?
- Problem area identification for Transition and Co-existence
- Testing Procedure Recommendations
- Decentralised Transition management guidelines
- Coexistence management guidelines

Environment Considerations: Deployment Motivation

- Network Service Providers
  - -service viability, end user requirements, opportunity, efficiency
- Product Vendors
  - -product evolution, new product
- User communities
  - -enhanced and/or new capabilities with direct user application
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- Cost Constrained - Opportunity Driven

Testing

- Scenarios
  - -test beds, bake-offs, simulators, vendor-based, client-based,...
- Objectives
  - -assurance, interoperability, functional stability, functional correctness, performance, efficiency, manageability, scaleability, cost identification,....
- Outcomes
  - -refinement and/or assurance

Deployment Considerations

- Product
  - -Availability, Cost, Reliability, Support
- Network Operational Impact
  - -Initial and Ongoing
  - -local and impacted considerations
- Network Service Environment Impact
  - -Initial and Ongoing
- Legacy Impact

Deployment Models

- Cut Over
- Transition
- Coexistence

NSP drivers

- (existence) continued viability of service
- (funded) end-user requirement
- (marketable) additional service
- (futures) experimental deployment
- (community) experimental deployment

Procedural Issues

- Testing
- Availability
- Refinement
- Coexistence
- Transition

Assumptions and Requirements

- Asserted assumptions and requirements
  - -list needs to be completed as well as prioritized.
- Structured so that every organization could plan for the migration without losing connectivity with the existing Internet
- Period of coexistence should be painless
  - Don't assume that the coexistence period will be short.
- Must maintain application compatibility
- Provide for Transition autonomy - independent transition of the network service, site and host

Assumptions and Requirements

- List Transition Mechanisms (pros and cons) with the required infrastructure support for each mechanism.
- List of software that need to be updated for each mechanism (related to infrastructure support)
  - -DNS
  - -Defacto Network Diagnostic Tools (tcpdump, ping, traceroute, etc.)
- Transition mechanisms must allow for incremental solutions
- List of essentials (hardware/software/system updates)

Assumptions and Requirements

- Must have a mechanism for the feedback to minimize the pain
  - -feedback to whom?
- Management of the new and the old infrastructure must use the same tools
- The local management commands which are used on a particular system to manage IPv4 should continue to work for managing IPv4 in a dual IPv4 / IPng environment

Assumptions and Requirements

- IPng Specification must have a transition plan with all the assumptions about the infrastructure listed in the plan.

QUESTIONS

- Following is the list of questions that need to be answered in order to satisfy the above requirement list. The questions have been grouped in several categories which can be changed as needed.

General

- What is the estimated timeframe for the IPv4 address exhaustion?
- Is there a deadline (such as exhaustion of IPv4 address) after which full backward compatibility is not possible?
- Will the customer be able to have incremental solutions?

General

- Should transition be separated into several independent more focused steps?
  - -Applications Transition
  - -End System Transition
  - -Interior Routing Transition
  - -Exterior Routing Transition
  - -Allocation of Network Numbers
  - -DNS
  - -Network Operator Functions

General

- What is the end user perspective on transition?
- What is the router vendors perspective on transition?
- What is the operators perspective on transition?
- What is the providers perspective on transition?

Addressing & Connectivity

- Is there a requirement on the new hosts to support both IPng and IPv4?
  - -Will IPng only systems exist that do not contain IPv4?
- Is it a goal for the new hosts without the IPv4 compatible address to communicate with IPv4 hosts?
  - -Will IPng only systems be able to talk to IPv4 only hosts?
- How can the IPv4 address space be used, if at all, for transition?

Routing

- Should plug and play be possible for routing during transition?
- Should Ships in the Night approach be used for routing IPv4 and IPng?
- Should transition encourage a movement to IPng only routing domains?
- During transition what will motivate customers to move to IPng as their primary routing protocol to replace IPv4?
- When will IPng address assignment start?
  - Is IPng Address assignment a gating factor for the transition?

Autonomy

- What parts of IPng must be deployed on the Internet if any before transition can begin?
- What are the requirements for providers to support IPng Transition?
- What are the requirements for system administrators?
- Should customers be able to begin transition at the end system or at the routing domain for IPng?
- What type of node configurations will be required to begin transition (e.g. Hosts only, Hosts and Routers)?
- Should Administration and Configuration of the transition be defined clearly and with details?

Mechanisms

- What are the generic advantages and disadvantage of different transition mechanisms?
  - Dual stack
  - Tunnelling
  - Translation
  - Single stack
- Will supporting both IPng and IPv4 network layers on hosts ease the transition?
- Should encapsulation be used for transition (why/where/how)?
- Should translation be used for transition (why/where/how)?

Mechanisms

- What are the cost trade-offs for different Transition scenarios?
- What are the alterations to other protocols within the TCP/IP suite to support transition?
- Does IPng system discovery have a role to play in IPv4 to IPng transition?
- Does IPng autoconfiguration have a role to play in IPv4 to IPng transition?

Domain Name Service

- Should IPng continue to use /etc/hosts?
- Must the transition rely on updating the DNS (defining a new RR type)?
- Should IPng name syntax be compatible with the IPv4 name syntax?

Coexistence

- Should existing APIs for IPv4 maintain binary compatibility?
  - For how long?
- Does an application using IPng APIs have to know the other system is IPng?
- What in IPv4 can we add that will help transition and can we rely on any particular IPv4 features?

Deployment

- What tools are needed for operators to support transition?
- How to accommodate different network protocols?

Performance

- What are the performance requirements of transition for each system?
  - -IPv4 to IPv4 via IPng (Tunnelling)
  - -IPng to IPng via IPv4 (Tunnelling)
  - - IPng to and from IPv4 (Translation)
- What are the failure modes and their effect on the performance