Planning for Protocol Transitions
draft-iab-protocol-transitions-02

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There are different types of transitions

• Transition (n.): the process or a period of changing from one state or condition to another

• Technical transitions
  • IPv6, DNSSEC, https, IDN, EAI, ...

• Organizational transitions
  • IANA, web site host, ...

• Focus is on protocol transitions (though some principles will probably also apply to other kinds)
Some principles from RFC 5218

- Incentive: Easiest when benefits come to those bearing the costs
  - To succeed, the benefits must outweigh the costs at each entity
- Incremental Deployability: Backwards compatibility is easier
  - Easiest when changing only one entity still benefits that entity
- Total Cost: Don’t underestimate the costs of things other than the hardware/software
  - Operational tools and processes, training, accounting/billing, legal, etc.
- Extensibility: Design for extensibility so that things can be fixed up later
Example Cost/Benefit Graphs

Diagram A:
- y-axis: $ (Cost)
- x-axis: Time
- Green line: Benefit
- Red line: Cost

Diagram B:
- y-axis: $ (Cost)
- x-axis: Time
- Green line: Benefit
- Red line: Benefit

Physical Diagram:
- For Diagram A:
  - Title: Example Cost/Benefit Graphs A)
  - Axes:
    - y-axis: $ (Cost)
    - x-axis: Time
  - Lines:
    - Green line: Benefit
    - Red line: Cost

- For Diagram B:
  - Title: Example Cost/Benefit Graphs B)
  - Axes:
    - y-axis: $ (Cost)
    - x-axis: Time
  - Lines:
    - Green line: Benefit
    - Red line: Benefit
Some Observations From ITAT Workshop (RFC 7305)

• Early-Adopter Incentives: Part of bitcoin’s strategy was extra incentives for early adopters

• Policy Partners: Policy-making orgs (RIRs, ICANN, etc.) can be important partners
Transition vs Co-existence

• Backwards compatibility means no significant difference
• Else either need transition (i.e. replacement) or co-existence (i.e., overlap period)
  • “Flag day” style transition increasingly impractical as number of entities involved increase
  • Coexistence increases costs during overlap period
  • An extended overlap period might result in further deployment of old mechanism

Any transition strategy for a non-backward-compatible mechanism should include a discussion of duration of overlap period (if any)
Backward compatibility, or lack thereof

• A translation/adaptation layer is often required if the mechanisms are not interoperable.
• Translation in the middle of the path can hamper end-to-end
• Translation at the end can be a resource issue if in a constrained node

Any transition strategy for a non-backward-compatible mechanism should include a discussion of where it is placed and a rationale.
What makes for a good transition plan?

1. Explanation of incentives for each entity involved
2. Description of phases
   • e.g.: pilot, co-existence, deprecation, removal
3. Timeline
4. Way to communicate it to entities affected and incorporate feedback