Internet Protocols and Innovation

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Innovation – Key to Internet Progress

• New protocols and applications introduced regularly
  – Some for special uses or economic sectors
  – Some in the hope of being the next “killer app”

• Historically, no centralized or regulatory impediment to doing this.

• Should not have one organization as the gatekeeper for progress, even in minor ways.
Using DNS Names, not Addresses

• Better for users
• Better for understanding
• More stable as ISPs change or sites make “multihoming” arrangements
• But: Makes the DNS part of the critical infrastructure
Innovation as Economic Driver

• New applications can breed new companies and developments
• Should avoid centralizing key functions, requiring approval or changes for a new protocol or application.
• Most network traffic today is web, email, and maybe file-sharing. But…
• “There is little or no usage on port N” is relevant only if we don’t care about tomorrow’s application.
• Very important for new applications that the infrastructure – including the DNS – behave predictably.
An Application and the DNS

• Can it depend on getting “no domain” if no registration?
  – “yes” for 250+ top level domains
  – “no” for a few

• For those few, can it depend on specific behavior to detect the situation?
  – With “fixes” for wildcards, depends on which domain, which tables, where one asks from
  – “Reset, timeout, or answer” – different behavior in different domains (and each has legitimate –non-wildcard– meanings)
Impact on Applications Writers and Users

• Makes it difficult or impossible to
  – Write new code, or keep old code working, acceptably and predictably
  – At least without a table of domains and their behavior
• Tables of domains and behavior
  – another workaround
  – Inhibit the successful deployment of new top-level domains
• These are subtle technical issues, but ones that have a direct impact on the user experience… and, potentially, on the economy.
A Registry-database Directory without Infrastructure Impact

• If one wanted to support a directory based on a registry database, it could be done by a naming convention, without a wildcard
  – http://com./ ??
• Users must be trained either way
  – To make typing errors
  – To use the naming convention
• But no wildcard or other infrastructure-threatening tricks.
• This is, at this point, a technical suggestion only – there might be economic or policy issues that would make it problematic.
Internationalization

- Move now underway to add characters to DNS other than those used for English
- Important to many populations, but new opportunities for consumer confusion for everyone.
- Examples – user sees link or URL in browser line, thinks it is something else.
  - eBay problem: worse with EBAY.com? (is that really €βαγ?)
  - USA.net (is that really in Thai?)
- Best solution appears to be prohibition of some combinations, not requiring eBay to register all 32 (or more) names.
- Wildcard causes unregistered names to map to search site.
“With all these problems… it is amazing the thing works at all”

- Internet is incredibly robust against many types of abuse
  - Not just the ability to get the bits through under stress
  - Misconfigured email systems often work acceptably anyway, and produce good diagnostics when they don’t (even though configuration errors should not occur).
  - Configuration programs select defaults based on names or environments that usually work (although this is not a good idea without several precautions).
  - Email — and fax and voice over the Internet — actually are fairly secure and private as long as you can trust the sending system, the receiving one, and the ISP(s) in between
That Robustness Depends On

• Very stable infrastructure, including predictable responses to unexpected conditions
• Very conservative behavior about what one sends in response to queries or other actions
• The principle of conservatism about what is sent is a part of every Internet standard protocol, even if not explicitly stated with each one.
• That a behavior is defined does not make its use reasonable, appropriate, or even permitted.
Ultimately

This discussion is

Not about preventing innovation
But about continuing to enable it for new applications