

The Future of the Internet



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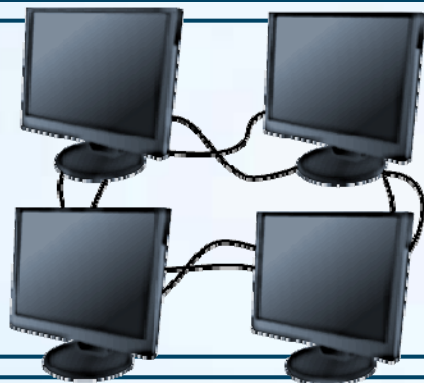
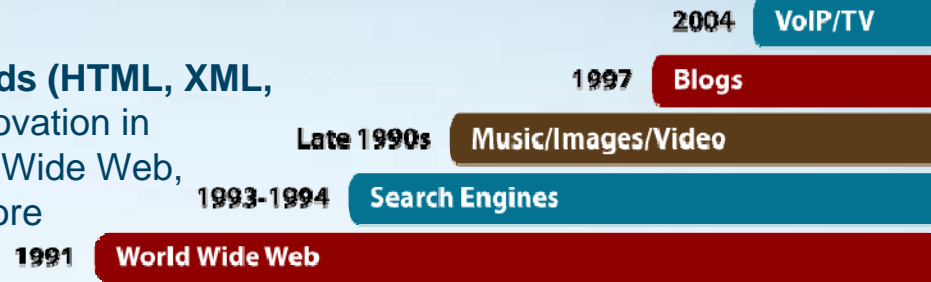
What I want to share with you today

- Personal view of future of the Internet
- Future issues for the DNS
 - IPv4–IPv6 transition
 - Internationalized Domain Names
 - New Generic Top Level Domains
- Overview of Internet governance and the multi-stakeholder model

ICANN's place within the Internet

- Future of the Internet
- Future DNS Issues
- ICANN Model
- Internet Governance

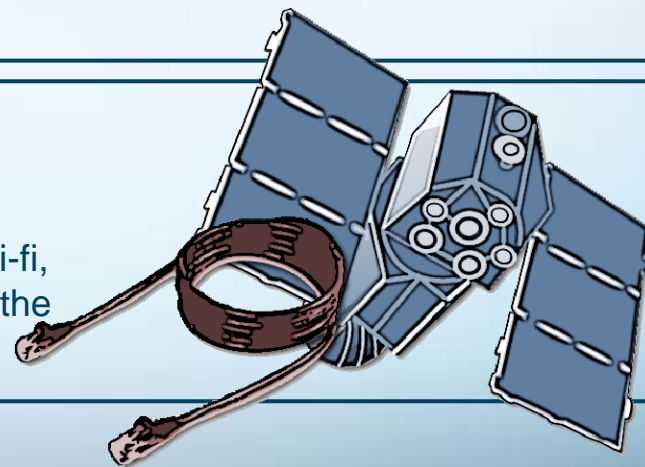
Content and applications standards (HTML, XML, Java) – Promotes creativity and innovation in applications leading to email, World Wide Web, ebanking, wiki, Skype, and much more



ICANN'S Responsibility

Internet protocols and standards (TCP/IP, DNS, SSL) – TCP/IP, controls traffic flow by dividing email and web data into packages before they are transmitted on the Internet

Telecommunications infrastructure – Physical network made up of underwater cables, telephone lines, fiber optics, satellites, microwaves, wi-fi, and so on – facilitates transfer of electronic data over the Internet





Future of the Internet

Future DNS Issues

ICANN Model

Internet Governance

What do we stand for?

- Single interoperable Internet
- All can express in their own language and identity **but...**
- All can communicate with all others
- Creativity and innovation is encouraged for the benefit of consumers
- Security of the network is maintained to ensure confidence in the model
- Stability of the experience for application development and consumer experience
- Growth is encouraged
- Resources are deployed efficiently in support of a global network
- All relevant stakeholders have a voice and role



Difficult to define what the Internet will look like in ten years, but...

- Usage limited by access to electricity – 3 billion
- Many, perhaps most, will access by mobile devices
- Significant increase in broadband access (over 100 mb/sec)
- Machine-to-machine Internet will overtake person-to-person Internet
- Billions of Internet-enabled appliances at home, work, in the car, in the pocket
- Internet used by third parties to monitor all sorts of activities and utilities – washing machines to cars to electricity meters
- Geo-location and geo-indexed systems much more common and emergency services will be more precisely dispatched

Future of the Internet

Future DNS Issues

ICANN Model

Internet Governance



Future of the Internet

Future DNS Issues

ICANN Model

Internet Governance

Difficult to define what the Internet will look like in ten years, but...

- Significant improvement in spoken interaction with Internet-based systems
- Wide range of delivery methods for intellectual property (movies, sound tracks, books, etc.). VoIP will be prevalent and SIP may be the principal protocol means by which calls are set up. Voice communication will be essentially free except perhaps for calls that terminate on traditional PSTN devices, including mobiles
- Almost no industry will be offline – most will rely on the Net for customer interaction, customer discovery, sales, service, advertising, etc.
- Group interaction, collaborative support tools (including distributed games) will be very common.
- Internationalized Domain Names and much more multilingual Internet content

What will the technical underpinnings of the Internet look like by then?



Future of the Internet
Future DNS Issues
ICANN Model
Internet Governance

- Terabit-per-second local networking will be available – backbones and local nets
- Domain name system will operate in multiple language scripts
- IPv6 will be widely deployed
- Better confidentiality and authenticity will be provided through the use of public key crypto – more authentication of the network
- Much more interdevice interaction will be common, incorporating position location, sensor networks, and local radio communication
- Spam and various forms of denial-of-service attacks will continue a “cold war” arms race with defences and better authentication techniques
- Operating systems will continue to be troublesome sources of vulnerability

What is IPv6 and why is it needed?

- Explosive expansion of the Internet is being driven by
 - Deployment of internationalized domain names
 - New gTLDs and ccTLDs expected in the near term
 - Greater multilingual access, content and business services on the Internet
 - Greater number of devices linking to the Internet – mobile phones, PDAs, pagers, and even appliances (refrigerators, televisions, windscreen wipers)
- Each device must have a unique numerical (IP) address
- IPv6 (128 bits) technology solution extends the current IPv4 (32 bits) protocol, enabling future expansion



What are the advantages of IPv6?

- Aside from allowing continued Internet expansion –
 - Allows every machine/device to have its own IP address, simplifying network design and facilitating remote configuration
 - Allows for very high bandwidth networks by making use of larger data packets, a benefit to academic, educational and scientific institutions
 - Opens door to next-generation devices
 - Enables better connectivity worldwide, allowing remote operation of home and office appliances and devices
 - Increases possibility of real-time data retrieval and transmission across the Internet
- A potential commercial advantage: gaining understanding of new technology sooner rather than later



Is the move to IPv6 inevitable?

- Short answer – Yes
- But, IPv4 will not disappear any time soon, even with increasing urgency to adopt IPv6
 - IPv4 will continue, especially in developing countries which have yet to introduce IPv4 infrastructure
 - No cutoff date for IPv4 address block allocations
 - Both systems will run in parallel for the foreseeable future
 - Possible reintroduction of unused IP addresses into the system under discussion
- Allocation and transition policies have been drawn up



Where we are now

- Pool of unallocated IPv4 addresses is projected to be fully distributed in mere years
- Perception as merely a technical issue – and disagreement within the technical community – have contributed to lack of movement to IPv6
- Now, many organizations and governments are stressing its importance publicly
- ICANN is developing a communications strategy to raise awareness and achieve stakeholder agreement, covering
 - Why they should move, and financial benefits
 - What happens if they don't move
 - The cost of moving and not moving to IPv6
 - How to transition to IPv6





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Internet
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**Ipv6 is the technology of today; IPv4
is the technology of yesterday**



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Internet Governance

ICANN's policy development role

- Safeguard an open, fair and equitable policy development process
- Be receptive to all stakeholders, public and private
- Be responsive to stakeholders who provide input and communicate next steps
- Communicate timely and useful information about the issue and the policy process



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Future DNS
Issues

ICANN Model

Internet
Governance

Internationalized domain names

- One of the most challenging issues to security, stability and growth of the Internet
- Recognizes that –
 - ASCII characters now used exclude entire communities
 - People familiar with other languages and other scripts will never become familiar with Latin alphabet
 - Need for growth in multilingual Internet access (local script domains)
 - Need for growth in multilingual Internet content
 - **Will cause an explosion in registered domain names – far beyond today's 128+ million domains**
- Encompasses –
 - Other alphabets (Cyrillic)
 - Right-to-left based scripts (Arabic)
 - Non-alphabet scripts (Mandarin Chinese)



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Future DNS Issues

ICANN Model

Internet Governance

IDN development principles

- Global uniqueness and interoperability of the domain name system
 - Unique and unambiguous domain names with same functionality regardless of geographic placement of access
- Promote “future-proof” solutions
 - Define characters that are allowed and an ability to add new ones
- Not all characters used in the worlds’ languages will be available for use in domain names
- Reduce user confusion as much as possible via technical development and implementation requirements, registry policies and user education
 - IDNA protocol standard in implementation
 - Promote multi-stakeholder involvement
- Role of ICANN Supporting Organizations and Advisory Committees



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Future DNS Issues
ICANN Model
Internet Governance

Where we are now

- IETF is finalizing the IDN protocol for defining characters that can be used to register domain names
 - Right now only 37 characters can be used in domain names
 - When IDNs are in place tens of thousands of characters will be available
- ICANN Board has approved a request for insertion of 11 IDN TLDs into the root zone
 - example.test will be inserted in 11 languages to evaluate the impact of IDNs
 - Users will be able to establish their own temporary pages from example.test with their name in their language
- Goal is IDN deployment in 2008



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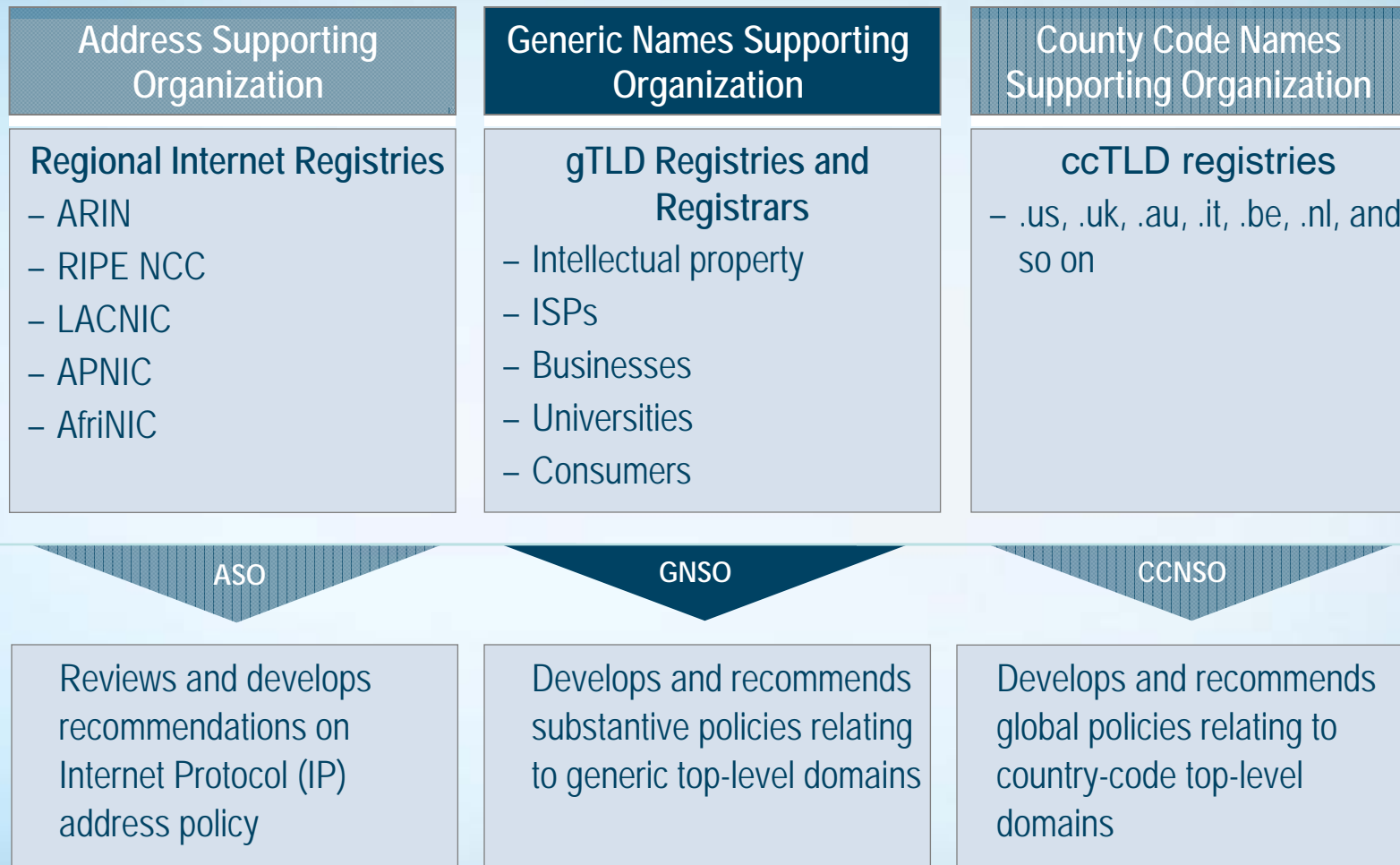
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Governance

New generic top-level domains

- Introducing new gTLDs has been part of ICANN's work since 1999
 - 2000 – .biz, .info, .name, .pro, .aero, .coop, .museum
 - 2004 – .jobs, .mobi, .cat, .travel, .asia
- Deployment has attracted much attention –
 - TLD space is small with many perceived business advantages
 - Sponsored TLDs increasing in their appeal to cultural communities, organisations and industry sectors
 - Conduct of process by ICANN and its community

New gTLD policy development process





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Future DNS Issues
ICANN Model
Internet Governance

Where we are now

- New gTLDs are about choice
- ICANN is developing a new application and approval policy that aims at streamlining gTLD applications and launching
- Although there will be an application round, the new system is intended to be standard for future applications and approvals
- New gTLDs could work in tandem with progress on IDNs for the introduction of new TLDs in new character sets
- Next round of new gTLDs expected in early 2008



Stability of current Internet governance model

- ICANN's role as consensus-builder of policies and protocols
- ICANN endorses WGIG definition of Internet governance –
 - *Internet governance is the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the evolution and use of the Internet.*

Future of the Internet

Future DNS Issues

ICANN Model

Internet Governance



Critical Internet resources

- Broader than merely ICANN's area of responsibility
 - Peering and interconnection
 - Telecommunications infrastructure
 - Innovation and convergent technologies
- IGF's goal is to ensure access to the information society for all

Future of the Internet

Future DNS Issues

ICANN Model

Internet Governance

Conclusions and observations

- The Internet is the most powerful and pervasive technology for empowering individuals
- It is part of the glue which ensures a rapid unleashing of humanity's knowledge and possibilities for all persons no matter what age, sex, creed, class, ethnicity or – at least to some degree – wealth
- It is radically reducing transaction costs and barriers to markets across a globalized economy

Thank You

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