Internet Structure and Organization

*Resources management and allocation*

*Bernard.Tuy@renater.fr*
Introduction

- What's the Internet?
- Why organizations / bodies are needed?
  - Define protocol specifications
  - Agree on a process for standards
  - Specify the rules of the IP resources allocation
Agenda

- Names, Acronyms … in the Internet
- ISOC, IETF organisation
- ICANN & IANA
- Standardisation process for IPv6
- Standard compliance
- Regional Internet Registries
- Requesting Internet resources
Internet “History”

1968
Δ ARPANET Demonstrated
Δ TCP/IP Invented
Δ First Gateway

1980
Δ ARPANET Transition To TCP/IP
Δ ARPANET Widely Used
Δ MILNET/ARPANET Split

1986
Δ NSI-net Initiated

1993
Δ Internet Society Founded
Δ Many Thousands of Everything
Δ World Wide Web

1996
Δ Multi-Protocol Environment

Operational Networks On Internet
3 20 60 300 500 900 19,000 50,000
Names, acronyms, ...

- **ISOC**
  - Internet Society
- **IAB**
  - Internet Architecture Board
- **IETF**
  - Internet Engineering Task Force
- **IESG**
  - Internet Engineering Steering Group
- **IANA**
  - Internet Assigned Numbers Authority
- **ICANN**
  - Internet Corporation for Assigned Names & Numbers
Names, acronyms …/3

- RIRs
  - Regional Internet Registries
- LIRs
  - Local Internet Registries
- NIRs
  - National Internet Registries
- ISPs / Telcos
  - Internet Service Providers
  - Operators
Names, acronyms, .../4

- DNS
  - Domain Name System
- Root NS
  - Root Name Servers: 13
- TLDs
  - Top Level Domains: .net, .org, .eu, .edu, ...
- CC-TLDs:
  - .fr, .nl, .uk
- G-TLDs:
  - .com
Internet Organization
ISOC

Internet Society

Info: http://www.isoc.org/

- Association under US law
  - Consortium of more than 150 organizations
  - 1100+ individual members in 180+ countries
  - 75+ « ISOC national Chapters »
- Hosts IETF activities and related organizations (IESG, IAB, …)
- « Internet experts that comments on policies and practices »
IETF organisation

- Areas : 8
  - Applications, Routing, operations & management, …
  - Area directors
- Working groups : 50 ?
  - (Internet Area) : IPv6-wg, DHC-wg, L{2,3}vpn-wg, …
  - WG charter
  - WG mailing list
- Meetings : 3 per year
- Attendees : everybody willing to …
- Ref. doc : RFC 2418 & RFC 3160
IESG

Internet Engineering Steering Group
Info: http://www.ietf.org/iesg.html

- Set of ADs (8 Area Directors) + IETF chair
  - IETF’s chair is IESG’s chair person
- Responsible for technical management of IETF activities
  - Approves new IETF wg creation
  - Review all IDs before they become an RFC
- Ref. Doc: RFC 2028
IAB

Internet Architecture Board
Info : http://www.iab.org

- Responsible for defining the overall architecture of the Internet, policies implemented ...
- Advisory group for ISOC and IETF
- IAB nominates IETF’s chair
- And approves the other IESG candidate members
- Ref. Doc : RFC 2850
ICANN & IANA

Internet Corporation for Assigned Names and Numbers

Info: http://www.icann.org/general/

- Internationally organised, non-profit corporation
- Dedicated to
  - preserving the operational stability of the Internet,
  - Achieving broad representation of global Internet communities
  - Developing policies appropriate to its missions
- Responsible for
  - IP address space allocation
  - Protocol identifier assignment
  - G-TLDs and CC-TLDs management
  - Root Name servers management
- These services are contracted with and performed by IANA
  - Info: http://www.iana.org/
RFCs and standardisation process

- **ID**: Internet Draft \((\text{lifetime} = 6 \text{ months})\)
  - Personnal proposal: ID
  - WG ID accepted
  - WG last call
  - IESG last call
  - ID => RFC

- **RFC**:
  - Informational
  - Proposed Standard => Draft Standard => Standard
  - Historic

- **BCP**
  - Best Current Practice
IPv6 standardisation

- 1995: First RFCs
- 1999: Core specifications ready
- 2001: transition mechanisms list closed
- 2004: still working on
  - MIPv6, encapsulation techs, MIBs, ...
- 11/2005: IPv6 wg has closed
  - Specification and standardization work are ready
Standards compliance

- Be sure the protocol interoperates w/ different manufacturers equipements / implementations

- Take care of the standard compliance when purchasing a network equipment

- Not only looking at the function you wish to get / use
Regional Internet Registries

- RIRs
  - Regional Internet Registries
  - RIPE-NCC: Europe+ + North Africa + Middle East
  - APNIC: Asia Pacific rim
  - ARIN: North America + South Africa
  - LacNIC: Latin America and Carribeans
  - AfriNIC: Africa
- NIRs: in Japan and Korea
- LIRs (members of a RIR)
  - Local Internet Registries
Regional Internet Registries
Whom requesting Internet resources from?

- Final user (customer)
  - Ask your ISP (Academic or Commercial)
- ISP
  - Ask a resource from your RIR
  - Supposes you’re a member of the RIR
- RIR
  - Ask IANA
What Resources to request?

- Resources?
  - IP prefix (IPv4 or IPv6): set of IP addresses
  - ASN: Autonomous System Number

- Requesting a domain name
  - Ask your ISP, CC-TLD registry or G-TLD registry
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