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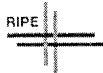
Second Regional Preparatory Conference for WSIS -
Partnership for Building the Arab Information Society
Damascus, 22-23 November 2004

TECHNICAL COORDINATION OF THE INTERNET

By
Rob Blokzijl
Chairman of RIPE - Reseaux IP Europeans

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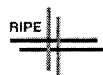




Technical Coordination of the Internet

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Outline

- **Introduction**
- **Internet Resources**
- **Addresses**
- **Autonomous System Numbers**
- **Domain Names**
- **Standards**
- **Other Organisations**
- **Conclusions**



Internet Resources

- **Internet Protocol addresses**
 - IPv4 and IPv6
- **Autonomous System Numbers ASN**
- **Domain Name System names**
- **Internet Protocol Standards**



Internet Resources

- **In general: finite**
 - not scarce
- **Often: hierarchical**
 - not top down
- **Often: unique**
 - not semantical
- **Always: managed**
 - not dictated



IP Addresses

- **A number**
 - IPv4: 32 bits (4.2 billion)
 - IPv6: 128 bits (a lot more)
- **Belongs to a network interface**
 - Not to a person
- **Globally Unique**
- **Used for routing**
 - aggregation



What is an IP Address? (1)

Example:

My email address:

k13@nikhef.nl

will be translated into Internet destination:

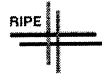
192.16.199.99

k13@[192.16.199.99] will also work



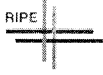
What is an IP Address? (2)

- **A number used for Routing**
- **Not dependent on Domain Name System**
- **IP does Not mean “Intellectual Property”**
- **How Many:**
 - IPv4: $4.2 \times 10^{**9}$ (4.2 billion)
 - IPv6: $3.4 \times 10^{**38}$ (340 undecillion)

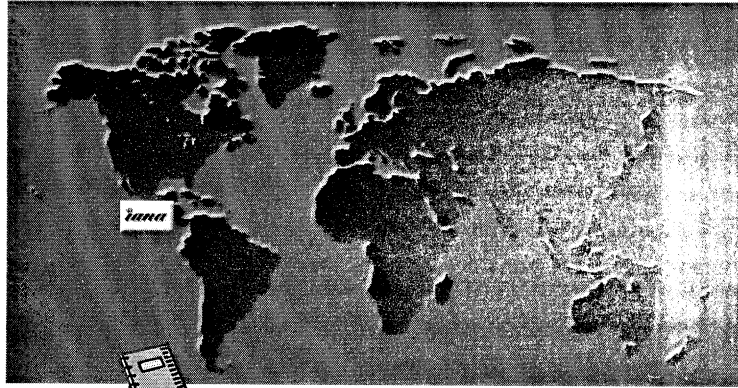


IP Addresses

- **Uniqueness, Aggregation and Conservation**
 - need rules: Policy
- **Rules are agreed among Internet Service Providers on a regional basis**
- **Regional Internet Registry: RIR**
- **RIRs ⁽⁴⁾ together with IANA co-ordinate globally**



Pre 1992

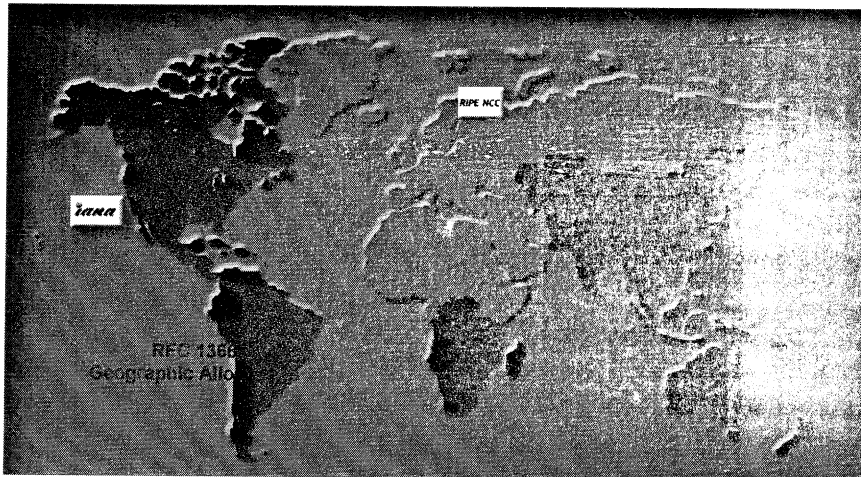


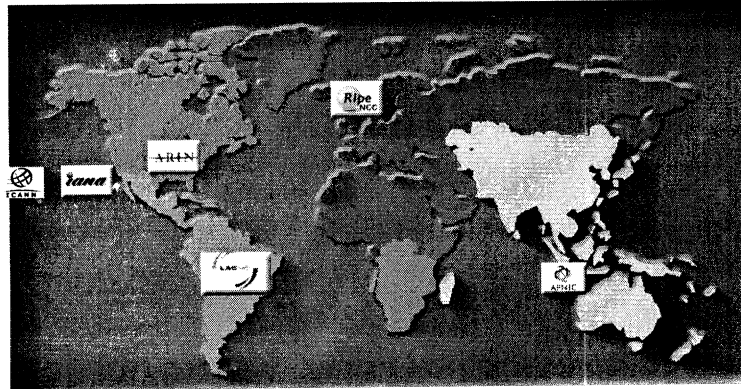
RFC 790
1981

"The assignment of numbers is also handled by Jon. If you are developing a protocol or application that will require the use of a link, socket, port, protocol, or network number please contact Jon to receive a number assignment."



1992





Address Management Policy

Conservation

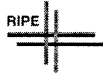
- Efficient Use of Resources
- Allocation Based on Need

Aggregation

- Limit Routing Table Growth
- Support Provider-Based Routing Policies

Registration

- Ensure Uniqueness
- Trouble Shooting



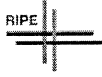
Autonomous System Numbers

- 16 bit number
- Globally unique
- Parameter of BGP4
- Used for routing
- Distributed to ISP by RIR
- No hierarchy or other systematics
- Global co-ordination by RIRs and IANA



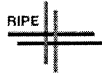
Domain Name System

- In the beginning there were numbers – 5 of them ☺
- Then came `hosts.txt`
- Finally: the DNS
 - First for `.com`, `.edu`, `.org`, `.net`, etc.
 - Country codes added later, such as `.ir`, `.ue`, `.sa`, `.nl`, etc.



Domain Name System

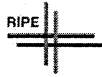
- **The DNS is 2 things:**
 - protocol
 - distributed and delegated database
- **The DNS is not:**
 - search engine
 - directory service
 - whatever else you may want it to be



Domain Name System

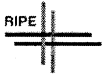
- Translate IP address into name
- Translate name into IP address
- That's all 😊

However... 😞



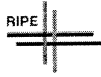
Domain Name System

- **Names look like words**
- **Words have meaning:**
 - Language
 - Culture
 - Ownership
 - Spelling
 - ...



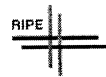
Domain Name System

- **Rules are needed**
 - First come first served, or
 - Highly regulated regime
- **Rules are set by national community:**
 - Users
 - Industry
 - Government
 - ...
- **Rules are governed by national law**
- **And nobody else!**



Internet Standards

- **Electronic mail**
- **World Wide Web**
- **File Transfer Protocol**
- **Internet Protocol IP**
- **Transmission Control Protocol TCP**
- **User Datagram Protocol UDP**
- **and 100's more. . .**



Internet Standards

- **Internet Engineering Task Force IETF**
 - Individual volunteers
 - Working Groups
 - Documents
 - Consensus
 - Standards RFC



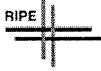
Internet Standards

- **IETF**
- **Internet Engineering Steering Group IESG**
 - Co-ordinate working groups
- **Internet Architecture Board IAB**
 - Oversees Internet Assigned Numbers Authority IANA
 - Oversees Internet Standards publication RFC-Editor
- **Internet Society ISOC**
 - Provides legal protection
- **RFC3160: The Tao of IETF (www.ietf.org/tao.html)**



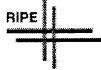
Other Organisations

- **ICANN**
 - Currently home of IANA
 - Regulates gTLDs (.com, .org, etc.)
- **ISO**
 - ISO 3166-1 for ccTLD codes
- **UNICODE**
 - National characters
- **IEEE**
 - Ethernet standard + addresses
- **And more, I am sure ☺**



Other Other Organisations

- ITU-T
- United Nations
- WIPO
- National Governments
- European Union
- WSIS
- And more, I am afraid ☹



Other Other Organisations

“The co-ordination responsibility for root servers, domain names, and Internet Protocol (IP) address assignment should rest with a suitable international, intergovernmental organisation”.



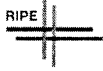
Conclusions

- **Self-regulation works well**
- **If it works why change it?**
- **No “international, inter-governmental organisation” needed**
- **More participation needed!!!**

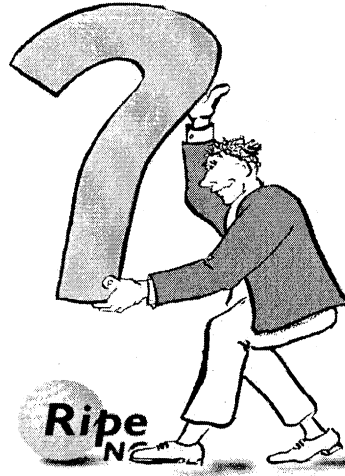


PARTICIPATE!

- **RIPE 50**
 - Stockholm, Sweden, 2-6 May 2005
- **APNIC 19**
 - Kyoto, Japan, 16-25 Februari 2005
- **LACNIC VIII**
 - Latin America, 6-9 June 2005
- **ARIN XV**
 - North America, 17-21 April 2005
- **IETF 62**
 - Minneapolis MN, United States, 6-11 March 2005



Questions



www.ripe.net