# Workshop report

Internet Governance Forum 2014
Turkey, Istambul

## WS62

## Internet infrastructure:

## Technology and Terminology

TUESDAY SEPTEMBER 2, 2014     WORKSHOP ROOM 02

# 1. Workshop overview

This workshop provided an introduction to Internet technical and governance terms and serves as a layperson's introduction to the topology of the Internet, providing definitions and explanations for key terms and jargon. It will also give an overview of the constellation of Internet governance organisations and their respective roles and responsibilities.

This workshop has been offered at the very beginning of each IGF, in order to afford IGF participants an overview of the sometimes-obscure terms of the Internet governance and technical communities in advance of their week of participation.

**Start and finish time**
09:06AM - 10:08AM.

**Attendance**
50 participants.

**Moderator**
Bill Woodcock - Executive Director, Packet Clearing House.

**Speakers**
Nishal Goburdhan - Internet Analyst, Packet Clearing House.
Audrey Plonk - Director of Cyber security and Internet Governance at Intel Corporation.
Rohan Samarajiva - Founding Chair, LIRNEasia.

**Remote Moderator**
Bevil Wooding - Internet Strategist, Packet Clearing House.

**Host Organisations**
The Internet Service Providers Association of South Africa (ISPA), the American Registry for Internet Numbers (ARIN), the Open Technology Institute (OTI) and Intel Corporation.

# 2. Discussion summary

The workshop started on time with an initial count of about 35 participants. The moderator presented the workshop theme and introduced each of the panelists.

Mr. Goburdhan started with the first part of the workshop, dedicated to explaining the basic technical mechanisms of the Internet. The first topic explained was *Resolving a Domain Name* and the concepts *IP address, Domain, Resolve and Packet* were introduced to the audience. The next topic was *Web browsing* and the following concepts: *URL, ccTLDs and Internationalised Domain Names (IDNs).* In this section, it was explained how to the extract the domain name from an URL and the iterative process of resolving the domain name to an Internet address.

The third topic presented was the *Topology of the Internet*. The concepts *routing, transit connection, peering interconnection and hot-potato routing* were introduced and

explained. Further, an example of packet routing from a user to an Internet server using the hot-potato routing mechanism was explained.

The fundamental concept illustrated in this section was the symmetry on the routing paths for both Internet service providers through the use of a local and a distant IXP.



Mrs. Plonk took over the second part of the workshop to explain the constellation of Internet governance organisations and what their respective role is in the global governance scheme.

The first set of organisations presented were the *Internet Engineering Task Force* (IETF) and their role setting technical standards allowing interoperability followed by the *Internet Engineering Steering Group* (IESG) and *Internet Architecture Board* (IAB).

The session continued describing the role of several organisations, not involved in Internet protocols creation and maintenance, but important in one way of another to the development of the Internet. The *Institute for Electrical and Electronic Engineering (IEEE)* is the body that created and maintains the 802.3 (Ethernet) and 802.11 (WLAN) standards, used by the Internet Protocol to community mostly to end users. The *World Wide Web Consortium (W3C)* was presented.

We moved on into the organisations administrating the uniquely-assigned identifiers. First off, the *Internet Assigned Numbers Authority (IANA)* is the root of the delegation hierarchy which maintains uniqueness in domain names, IP addresses, autonomous system numbers, and protocol identifiers. The *Internet Corporation for Assigned Names and Numbers (ICANN)* was also presented.

The panel continued discussing the role of the five Regional Internet Registries (RIRs) as fora in which Internet users and service providers set addressing policy and share constrained number resources.

- LACNIC: the Latin American and Caribbean Network Information Center
- AfriNIC: the African Network Information Center
- RIPE NCC: Réseaux IP Européens Network Coordination Centre
- ARIN: the American Registry for Internet Numbers
- APNIC: the Asia-Pacific Network Information Center

In the operational space, we discussed what *Network Operators Groups* such as NANOG, LACNOG, CaribNOG, SANOG, AfNOG are. We also talked about the *Internet Exchange operators*.

Finally, the presentation concluded presenting advocacy organisations like the *Internet Society (ISOC)* or the *OpenNetInitiative (ONI)*, both aiming at preserving the open nature of the Internet from complementary angles.

# 3.  Q&A Session

This is a summary of the most important questions formulated when the floor was open for the Q&A session:



### Why is it so important to have unique identifiers?

It is a fundamental principle required by the Internet to remain global and unique. It allows two parties to be identified and have a unique communication, exclusive to themselves.

### What are the differences between the Regional Internet Registries and the Internet Service Providers?

The Regional Internet Registries are community-based membership organisations dealing with the management of unique identifiers for the region. The registries have bottom-up multi-stakeholder processes driven by the community and an open policy-development process. Internet Service Providers (ISPs) are the commercial operators of the networks that deliver Internet bandwidth from Internet Exchange Points, where it's produced, to customers' locations.

### How are the IP addresses allocated to RIRs?

The IANA allocates large chunks of address space to the RIRs. In turn, the regional registries allocate them to their constituency. Europe and Asia-Pacific have run out of IPv4 addresses because their usage rate has been faster.

### What are the differences between IPv4 and IPv6?

The fundamental difference between IPv4 and IPv6 is the size of the address space available to allocate. The current IPv4 version uses 32 bits for the IP address, with a maximum of 4.294.967.296 unique addresses. The IPv6 address uses 128 bits, extending the number of addresses to 340.282.366.920.938.463.463.374.607.431.768.211.456 this is 340 sextillions. One of the direct consequences is an increase on the packet size, for instance.

### How do we balance the interests of the private corporations and the global public?

The Internet governance space has grown over the past thirty years. As the Internet expands and becomes more pervasive, governments, private sector, NGOs and the civil society establishes new spaces for collaboration and cooperation such as the Internet Governance Forum.

### Who pays the bill of all these organisations?

As an example, this meeting, the IGF 2014 is paid by the Turkish Government and other private and government contributions. Business from the private sector often fund existing structures tasked with the development and maintenance of existing standards. ISOC pays its bills by selling .ORG domain names, while the many unique-name-and-number constituencies jointly cover the operating costs of ICANN.  Packet Clearing House is funded by donations from more than 600 Internet industry companies and more

than 20 governments. Generally, most Internet governance organizations are described as "membership based" or otherwise constituent-funded.

# 4.  Conclusions

According to the feedback given by some of the attendees, this is a very appreciated session since it explained in very clear terms the fundamental concepts and terminology used across the workshops of the Internet Governance Forum.

This year's session was scheduled on the first day, which we encourage the organisers to do in the future, since it increases its value.

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# PCH

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