Response to the consultation of the Working Group on Enhanced Cooperation for consideration at its second meeting

Submission of the RIPE NCC

15 December 2016

Introductory comments

The RIPE NCC thanks the Chair, and the Working Group, for the inclusive and transparent approach it has taken by accepting comments from all stakeholders at the beginning of its work.

In general, the RIPE NCC would suggest that the Working Group prioritise working on recommendations which are concrete and focus on delivering results related to enhanced cooperation that deliver practical benefits for end users of all kinds, especially those in developing and least-developed countries.

What are the high-level characteristics of enhanced cooperation?

It is our experience that this is one of the most difficult areas to gain consensus on and any consensus result is always a significant compromise. It is therefore hard to see how much value will be gained from focusing on characteristics of enhanced cooperation.

It may be more valuable to simply make clear that this is an area that has been challenging and to point to previous efforts, especially where it is possible to discern some common elements across those efforts.

What kind of recommendations should the Working Group consider?

The RIPE NCC believes the Working Group should focus on a few key areas:

1. It should agree that there are areas where the current level of enhanced cooperation as defined in Tunis have yet to deliver adequate results;
2. It should focus on recommendations that relate to what is communicated, and avoid those related to the network as a shared platform and resource upon which all communications rely – and further explicitly state that intra-national and international activities in relation to online communications should be least distortive or disruptive as possible to that shared platform. We have provided some more information on this concept in the Annex below.

3. It should identify areas where greater cooperation would be of general socioeconomic value, especially to developing and least-developed countries, and prioritize cooperation that is most likely to be effective in practical terms.

About RIPE NCC

The RIPE (Réseaux IP Européens) Network Coordination Centre, or RIPE NCC, is the Regional Internet Registry (RIR) for Europe, the Middle East and parts of Central Asia. As such, we allocate and register blocks of Internet number resources to a membership of around 15,000 organisations, mainly Internet service providers (ISPs), telecommunication operators, government and academic institutions, and corporations.

The RIPE NCC is a not-for-profit, membership-funded organisation that works to support and facilitate the activities of the open RIPE community and the wider Internet community.

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ANNEX

The difference between the network and the data it carries

The Working Group should agree that the publicly Internet is two separate things:

1. The network that makes communications between any connected devices possible - the "network as a platform" [1];
2. The data and associated services that use that network as a communications platform (or "data carried by the platform").

The Network as a shared platform

The network is an interrelated web of hardware and software that utilize common standards to ensure each component has the common ability to perform certain functions relating to network operation. This concept – referred to as "interoperability"[2] – is important because it allows maximum flexibility in designing networks and related systems.

The grouping of standards that make communications interconnection in the network possible are known as the "Internet protocol (IP) stack." IP-based networks are designed to operate with maximum efficiency, and a continuous process of evolution of these standards responds to the need for greater performance, interoperability, resiliency, trust and security over time.

What we call the public Internet is a "network of networks," the large majority of them privately owned and managed by corporations, whether for the use of their employees or, in the case of Internet service providers (ISPs), for their customers to connect to the rest of the Internet.

Simply put, there are three types of entities that collectively make basic connectivity, and therefore the public Internet, possible:

1. Internet Service Providers (ISPs): entities that provide connectivity for end-users (ranging from single mobile devices to the largest corporations). Most countries have from several to dozens of operating ISPs.

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[1] For the technically minded, the network as a platform corresponds to the lowest four layers of the OSI model and the lowest three of the TCP/IP (RFC 1122) model.

[2] For a user-friendly overview of the Internet and the "network of networks" that it is comprised of, the Internet Society's "An Introduction to Internet Interconnection Concepts and Actors" (Internet Society, 2012) is recommended (see www.Internetsociety.org/sites/default/files/bp-interconnection.pdf).

2. Backbone providers: entities that connect ISPs to one another, but that do not have end-users as customers; these entities are often responsible for making connections between countries and continents possible.
3. The processes and institutions that manage those processes by which unique identifiers are allocated, such as IP addressing and the domain name system (DNS). These are analogous to telephone numbers or postal addresses in that they allow any "node" (of which your mobile phone is one, and your desktop PC or laptop is another) of the network to be identified and reached from any other node, and ensure that worldwide every single address is used only once.

Each ISP or backbone provider must do two things (aside from connecting to its customers):

- Connect to other ISPs so the exchange of data between their respective customers is possible, and connect to backbone providers (either directly or indirectly) to allow international traffic exchange. Without these agreements (often known as "peering" or "interconnection" agreements), the Internet would cease to be a global platform and exist solely as ISP-specific "islands" that would only allow users to connect to the other customers of their own ISP.
- Acquire the various types of technical addresses that are used for its equipment and that of its customers to connect to others, and implement the related services (like DNS servers) that allow every single device on the public Internet to have a unique address and to allow its customers to be found and to find all others.

The result of all this is that these networks (if left to themselves and the web of stakeholders who operate and maintain them) can:

- Automatically find the optimal (which is not necessarily the most direct) *route* between any two points at any given time.[3] An important fact to remember is that the route between any two points may traverse third countries, and that route may pass through *different* third countries at different times of the same day. This is especially common in border areas where two countries have dense populations near a shared border.
- Create a communications connection between any two points in a way that optimizes *performance* in the networks through which that communication

[3] Throughout this paper illustrations refer to connections between two points ("point to point"), to make key points easy to follow. There certainly are communications where a single origin is connecting to multiple endpoints simultaneously and each of these endpoints may be in different countries from one another.

passes. This can result in a route being taken that is *geographically* complex to ensure the communication "performs" better.

- Ensure that anyone may extend the public Internet simply by connecting a router[4] to the "edge" of the network and applying for a unique address for that router. Acquiring that address is often automatic, though public Internet addresses are ultimately distributed by Regional Internet Registries (RIRs)[5].

The public Internet as a platform is inherently blind to geography in a way that the "offline" world is not.

How to treat the network as a platform

Looking at the network as a platform suggests several policy objectives that the Working Group could usefully endorse:

- **Avoid actions that impede or distort basic functions such as addressing and traffic routing.** Where a country needs to prevent some communication from taking place, or prevent access to certain information that the network carries for whatever reason (such as to block child pornography), it must do so in a way that does not affect the operation of the network that carries those communications.
- **Avoid actions that might impact upon "transit traffic.**" As we have seen, traffic often – for reasons relating to the structure of the Internet – transits a country for which it is neither the destination nor the source. This argues strongly for such transit traffic to remain untouched and unhindered – after all, failing to respect transit traffic of others could lead to reciprocal lack of respect for your own.
- **Avoid national or international policies that distort private-sector choices about how equipment or services integral to the functioning of the network as a platform are made.** Measures of this type – often called "local hosting" obligations – can refer to elements of the network as a platform (like submarine cables, routers or related equipment), but they are most often intended to

[4] A router is a device that "talks" to other such devices to figure out how to forward requests from any device connected to it to any other part of the network. The standards used ensure that this can happen automatically, and as the network topology changes in real time these changes are "learnt" by those devices that need to know about them. Pretty much every business and residence has a router, in the latter case generally provided by the Internet service provider.

[5] These organisations are responsible for managing the key forms of addressing on the Internet, which are akin to the various types of addresses in the worldwide postal system in the functions they perform. All of them are ultimately linked to the Internet Assigned Numbers Authority (IANA), managed by the Internet Corporation for Assigned Names and Numbers (ICANN). IANA and the RIRs work together (more information is available at http://www.iana.org/numbers).

influence where applications, data and related services are hosted. Obligations that distort investment choices (where those choices would otherwise seek to optimize performance and resilience in the network everyone uses as a platform) should be avoided: aside from anything else, we cannot connect the unconnected four billion-plus people as quickly if individual countries' choices make the network more expensive for everyone. An example from the offline world is roads: we want roads to be well maintained, with enough lanes to handle peak traffic, and ideally to have multiple connections between locations so that when traffic congestion affects one road we can take alternative routes.

At the same time, we believe that there are positive objectives that the Working Group could highlight and build upon:

- **Establish information-sharing relationships between governments and network operators for developng strategies to improve network operation in a given location.** The challenges facing network developers and operators are diverse, and can relate to regulation, geography or commercial issues. There is no "one size fits all" solution, and successful strategies to develop capacity and improve network performance often need to incorporate a range of considerations. Developing a model in which all stakeholders can effectively contribute is a first step towards this goal.