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**A written statements on the subject of the
Hearing on future Internet Governance arrangements**

Competitive Governance Arrangements for Namespace Services

Introduction

This statement wishes to be a constructive and effective contribution to the current debate concerning Internet Governance, which should be termed more exactly, Information Networks Governance. Commissioner Reding in her 4 May 2009 video address declared : *who decides on new top level domains in addition to the existing ones, such as ".com", ".fr", ".de" or ".eu", we can have? Who decides on the price that domain name registries and end-users should pay for new domain names? Who, in the last instance, guarantees the stability and openness of the internet for users in the whole world? Today the main player in all those decisions is ICANN, the Internet Corporation for Assigned Names and Numbers. ICANN is also entrusted with the IANA functions managing the root of the internet, the Internet's core directory.* and then latter : *Let us not forget that ICANN, in the end, has the unique position of a global quasi-monopoly. The global nature of the internet is its very strength and it certainly requires global management. But monopolies always involve the risk of abuse.*   Before proposing ways on how to co-managed this "quasi-monopoly", the first issues that must examined are : Is ICANN truly a "quasi-monopoly" ? Are there any technical means to end up this monopolistic situation ? . Then, if there is an effective solution to open to competition name resolving services, what are the consequences in terms of governance ?

The well known EU commission policy is to open up competition in areas previously controlled by monopolies. Furthermore, according to the recommendations of the Geneva action plan concerning the C2.Information and communication infrastructure action line *Governments should take action, in the framework of national development policies, in order to support an* **enabling and competitive environment** *for the necessary investment in ICT infrastructure and for the* **development of new services.**

To my knowledge, the EU commission has never made a Framework Program call to finance research to investigate if it was technically feasible to open the Name Space services market to competition, and what would be the options.

First fundamental preliminary issues

The Domain Name System(DNS) was invented by Dr. Paul Mockapetris in 1983. ICANN is relying on the DNS. As for now, the only competitor to ICANN appears to be the Handle system invented by Dr. Robert Kahn from the Corporation for National Research Initiatives (CNRI, USA). The Handle System is providing name resolving services for digital objects and other Internet resources, with quite a different approach and philosophy. Current applications of the Handle system are mostly limited to libraries and academic journals. The Handle system is being listed as an "emerging trend" by the ITU, and I consider that this system could one of the best suited for the Internet of things (The Challenges of the Internet of Things, IGF Hyderabad 2008). However it is realistic to assess that the DNS is the overwhelmingly dominant player, and it is correct to state that the DNS, as managed by ICANN, is a *de facto* monopoly or a "quasi-monopoly".

Concerning the Internet of things, the nameservice that has been adopted by EPC Global and GS1 is the Object Naming Service (ONS). The ONS operates through the DNS (which is managed by ICANN), for example an ONS object identifier is translated into the domain name :
   000024.0614141.sgtin.id.onsepc.com which relies on the .com gTLD and the onsepc.com domain name. What is staggering is that all the ONS namespace, that should become orders of magnitude larger that all the existing DNS namespace goes through only one domain name !. The secondary namespace xxx.onsepc.com as for all domain names is privately managed by the domain name owner that has all control over this namespace. There is nothing new in that regard. This ONS namespace is managed through a database maintained by Verisign. Recently, another ONS root based in Europe :onsepc1.eu has been added, whose database is maintained by Orange Business Services. Another ONS root is proposed in China.
The resolution of the .com and .eu extension is managed by ICANN. The resolution of onsepc.com domain name is under ICANN control, while the onsepc1.eu is under control of the European ccTLD : EURid .

Concerning the Next Generation Networks, whose *general idea behind NGN is that one network transports all information and services (voice, data, and all sorts of media such as video) by encapsulating these into packets, like it is on the Internet. NGNs are commonly built around the Internet Protocol, and therefore the term "all-IP" is also sometimes used to describe the transformation towards NGN* (quoted from Wikipedia). ITU offers a detailed definition of NGN. There is one specific namespace for NGN : ENUM, a telephone number mapping managed by ITU.

Towards an effective opening to competition through the use of DNS *class* namespaces

My proposal that it is possible to open the competition, by using the very Domain Name System(DNS) itself. The proposal is being presented under the name "**Net4D**" (http://net4d.org) (ie Network for Development). An outline was sketched for the first time (Net4D: New classes to bind people and machines) at the Internet Governance Forum (IGF) in Rio in 2007. The proposal was presented with more details (Towards an open governance of the DNS system) at the IGF in Hyderabad in 2008, and it has been recently presented (Opening to competition the namespace infrastructure) at the WSIS Action Line C2 (ICT Infrastructure) Facilitation Meeting (20 May 2009).

It is important to underline the little known fact that the current DNS system was designed from the outset as a naming tool available for networks other than the Internet, specifically the Chaosnet and Hesiod networks. These networks, now only of historical interest, were never under the governance of the IETF or ICANN. They are constituting very significant legal precedents.

Such a design is implemented with the help of a parameter named *class* that defines a network with its own specific and distinct namespace. *Classes* are defined by the RFC 2929. Each *class* is a autonomous namespace with its own DNS root servers and its own governance.

Starting from the years 1995, implementation of a number of alternative DNS roots fragmented and perturbed the IN *class* managed by ICANN. Therefore in 2001, ICANN itself recommended to make use of unused *classes,* especially one of the 256 classes for a "private use" for the purpose of an experimentation. Alternative DNS roots have been commercial and technical failures.

The Internet is using the *class* "IN" whose namespace is managed by ICANN. The Chaosnet and Hesiod networks *class* parameter value are respectively CH and HS. For all practical purposes, the field *class* only currently takes the value "IN", but there are up to 65,000 classes available and unused.

The network software of an internet user includes a DNS client software, also called "resolver" that is pointing to a DNS server that shall answer with an IP address to a request about a domain name. DNS clients appear in many applications (browser, ftp, email client, etc. ..). When a user accesses to the network, in most cases, the DNS server is determined by default by the ISP,. The DNS server, also by default, answers within the class "IN".

The RFCs (Request For Comments) are published by the Internet Engineering TaskForce (IETF) that "*develops and promotes Internet standards, cooperating closely with the W3C and ISO/IEC standard bodies and dealing in particular*

with standards of the [TCP/IP](#) and [Internet protocol suite](#). It is an open [standards organization](#), with no formal membership or membership requirements. All participants and leaders are volunteers, though their work is usually funded by their employers or sponsors; for instance, the current chairperson is funded by [VeriSign](#) and the U.S. government's [National Security Agency](#)." (from [Wikipedia](#))

It is the [RFC 2929](#) that take care of the question of *classes*. In addition to CH and HS classes and 256 classes that anyone can freely use them for "private use", the other 65,000 classes are not yet assigned classes, and may be assigned by "IETF consensus". If IETF were to decide to block classes assignments to stifle competition, one could legitimately ask why the IETF , whose governance sphere is limited to the Internet, is entitled to assign a class to a network other than his own ie: the Internet. Under international public law, governance and arbitrage between networks should be the responsibility of an international organization such as the [International Telecommunication Union](#), a situation that has been acknowledged by ICANN in its article 4 of incorporation: ICANN *"shall operate [...] its activities in conformity with relevant principles of international law and applicable international conventions and local law"* and *"shall corporate as appropriate with relevant international organizations."* -

It is proposed to create other IP based networks, and thus using the same technical pipes as the Internet, but legally distinct, precisely because they are using distinct namespace *classes*.

For a *class* to be usable in practice, it is required that the DNS client or "resolver" is able to receive from the DNS server the IP address corresponding to a domain name in this class. The BIND[1] software is the best known among [DNS server software](#) but there are a few others[2] .Most DNS clients and servers do not implement completely the RFCs, including RFC 2929. The field *class* is often considered as a fixed value with IN. Therefore, these software clients and servers shall have to be updated and that the *class* field must correspond to a true variable. This does not offer any particular technical difficulty.

There is no namespace fragmentation. The parallel use of several *classes*, is possible: users may use, at the same time, concurrent systems because they can be supported by the same DNS servers. It is transparent to the user, as shall be the transition from IPv4 to IPv6, which occurs at a different level. There is no conceptual problem.

In practice
Users are going to indicate the *class* with an extra field in front of the domain name. The syntax might be *class*% placed in front of the domain name. For example for *class* 4d (corresponding to the network Net4D) and CT class (corresponding to the Cyrillic network Сеть meanig network in Russian) could have the following URLs:

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[1]   http://fr.wikipedia.org/wiki/BIND
[2]   http://en.wikipedia.org/wiki/Comparison_of_DNS_server_software

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http://4d%fr.wikipedia.open
http://ст%Москва.ро
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In current browsers, there is no need to type http:// and therefore typing ст%Москва.ро woukd suffice. For a person writing only Cyrillic, one may envision that she/he set in her/his browser the class CT as the class by default so that the person would have only to type Москва.ро , without the need of any ASCII letters.

Potential Uses of Classes

Implementation of *classes* should facilitate the emergence of new ways towards an improved use of the Web. More oriented towards new developments, this new network fabric shall be more dynamic, shall provide a new frontier to innovations, and shall be open to civil society and to linguistic diversity, developments, as well as meeting the expectations of innovative industries and emerging countries

Use of new *classes* can be the vehicle for a different approach of the Web in emerging countries, with costs that are directly determined by the governing body of the *class*, and therefore potentially much lower.

This could be achieved through the semantic web, using markups and tags of content according metadata and logic languages schemes (ontologies), allowing for far more relevant access to data than in full text. It is therefore proposed to implement *classes,* called _semantic classes_ , where the legal and technological innovation lies in the fact that owners of domain names are contractually obliged to follow a specific ontology, or to lose their domain names. It would be therefore possible to create namespaces as zones where metadata may be trusted.

As an important consequence, this would redefine the text-based search engines' market, which is currently almost a monopoly, to allow the emergence for new search engines using metadata as well as text.

A very important point is that *classes* could use UTF8 encoding, allowing a natural, simpler and more efficient implementation of multilingualism, instead of the current system, whose progress is very slow, which is based on ASCII and transcription UTF8 – ASCII.

Yet another very important point is the Internet of things whose governance is nascent and whose namespace is expected to become orders of magnitude larger than the current namespace. If for any reason, good or bad, the Handle System does not emerge as the namespace technology for the Internet of things, then, at the very least, the current object Naming Service (ONS) should be improved so that it operates with one or several *classes* in order to truly constitute independent and interoperable Networks of Objects. It should be investigated if one *class* of the Networks of Objects could interface with the Handle System.

Last but not least, concerning Next Generation Networks, it should be quite

logical that next generation namespaces should be developed using *classes*.

Applications to explore: :
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- ✓ *Class* namespaces would offer alternatives to new ICANN extensions (new gTLDs) that would be technologically and economically attractive and would allow creation of a space of trust.
- ✓ Implementation of the Internet of Things, with the creation of M2M software, using semantic tags recognition and automated processes operation;
- ✓ Creating cityTLD or regionTLDs in multilingual *semantic classes*, without the financial and technical constraints imposed by ICANN, in order to empower communities to implement societal strategies.
- ✓ Implementation of multilingualism based on both UTF8 and metadata resulting into much more efficient[3] automatic translations.
- ✓ and the possibility of using UTF8[4] encoded emails. *Classes* may be the avenue toward for a real "Babel Web".
- ✓ Using a trusted semantic web in order to cross-reference information enabling the creation of databases, e-market places and thus empowering far more efficient price comparators. Use of price comparison combined with e-market places would allow automatic or assisted e-transactions;
- ✓ Content marking would also enable construction of trade-related specific thesauri (aeronautics, health, logistics, etc.).
- ✓ Creating DNS *classes*, under the governance of WIPO in direct relationship with 45 classes of trademarks of the International Classification under the Nice agreement, enabling a trusted namespace for brands, either alone or in combination with other DNS *classes* ensuring legal and commercial security, vehicle for economic growth.
- ✓ Creating a DNS *class*, under the governance of the United Nations or ITU, its specialized Telecom agency, concerning the namespace of entities under international public law.
- ✓ Creating DNS *classes* related to Education, Culture and Science under the governance of UNESCO.
- ✓ Creating specific *classes* related to the 3D web building upon existing work (Web3d)

From a political point of view, the existence of new *classes* is a kind of revolution in the governance of the namespaces of IP-based networks. It is a constructive revolution however, because related governances may co-exist

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[3] Whenever a given text is available in several language versions, the translation could use the various versions to clarify and remove ambiguity. For example, the translation of the French "société" that could be translated either into "company" and "society" in English. The availability of a Spanish version where the term is translated as "sociedad" would help to make the right choice.

[4]   http://en.wikipedia.org/wiki/UTF-8

technically.

Concerning DNS security, a centralized security could then be replaced by distinct decentralized security systems related to each *class*, offering a commercial and political independence for all players. In the DNSSEC system the root signing authority may be distinct according to each *class*.

Concerning economics, *classes* are opening the namespace market to competition between potentially 65,000 players and would end the monopoly of the historic operator.

At the scientific and technological level, the *classes* allow innovation (eg semantic web, Multilingualism, M2M, etc......) to flourish.

Implementation of *Classes*

Experiments
If the the general deployment of *classes* cannot be considered immediately - except in areas under centralized governance – one should consider experimental periods in various areas having an interest in the project, either for political or economical reasons or for local reasons (language, cultural diversity,etc.)..

Experiments may be performed at the level of a country, a region, a city, using one of the 256 classes scheduled for private use.

In the experimental area, implementation of *classes* shall be ensured in :
1) all DNS servers of all major ISPs operating in the area ;
2) servers and DNS clients, servers and other web applications, at, local or remotely located companies, operating in the area;
3) servers and DNS clients, servers and other web applications, at local (or even national) authorities, associations as well as individuals operating in the area :
4) DNS clients and browsers of users participating in the experiment .

The participation of major ISPs in the area should a requirement in order to start an experiment, the participation of other players will be implemented be on a voluntary basis, while a website would feature a dynamic list of current participants.

Financial aspects
The deployment of this experiment could be envisioned within the framework of the ITU and the European FP7 projects with both and ICT and International Cooperation components, with the help of associations, and commercial, regional or national entities. Specifically, one approach is start with an experimentation involving specific regions, considered as large scale experimental e-facilities, willing to test new DNS *classes*, possibly as alternatives to ICANN cityTLDs or RegionTLDs.

Consequences in terms of governance.

The consequences of an effective opening of the namespace services to competition are quite fundamental. If it appears quite reasonable that ICANN is not going to stay a quasi-monopoly in a foreseeable future, then the goal of intergovernmental and governmental stakeholders shall no longer to try to co-manage the quasi-monopoly, but instead their tasks should be to ensure that competition is effectively promoted ,and to take care that the competition is fair and open.

Therefore the introduction of Namespace *classes* is going to move inter governmental oversight to a higher level. A comparison can be made, for illustrative purpose, with the situation with telephone services. In old times, telephones services were almost everywhere national monopolies, either commercial quasi-monopolies like ATT, or state-run monopolies. A strong effort has been made all over the world to open telephone services to competition. It would be hard to imagine, that back in those times, the EU would have try to co-manage national telephonies, instead of trying to open the phone market.

ICANN is the historic operator (a similar situation occurs in the telephone market). In the long run, ICANN would become just one of the many namespace operators, yet possibly still the main operator, but not in overwhelming way. It appears therefore that ICANN should not burdened any longer by any intergovernmental or governmental oversight. This oversight should focus instead on maintaining a fair and transparent competition.

However, in the near future, at least until its monopolistic position prevails, some multi-stakeholder oversight including: intergovernmental or governmental stakeholders, private sector and civil society could be maintained, as a precautionary measure, to ensure that ICANN shall not be tempted to use its current market power to stay in a quasi-monopolistic situation.

The Namespace *classes* provides also an enabling environment to linguistic diversity with a natural implementation of various scripts, and this is quite important culturally and politically.

Concerning the [Internet of things](), its nascent governance could be established with the help of *classes*. Concerning [NGN]() , much could be done.

Conclusions

Namespace *classes* may give a renewed energy to the scientific, technological and economic development of the web, opening, through competition, new spaces of freedom and independence. It would contribute to give birth to a new era of internet governance. Namespace *classes* are certainly a key strategic element to consider in order to confront the global economic crisis.

As always, the advantage goes the first movers, the European Union should become therefore actively engaged in promoting and implementing namespace *classes,* to take part in the most favorable ways in this new area of open competition.