Critical Internet Resources (CIRs) within the Scope of Internet Governance

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Background:
During the World Summit on Information Society (WSIS) internet governance was a major issue that dominated the activities of its second phase among all stakeholders (Governments, Private Sector, Civil Society and International Organizations). Part of the outcome of the second phase of the WSIS, Internet Governance was defined in paragraph 34 of the Tunis Agenda as: “the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the evolution and use of the Internet.” Within this definition, Critical Internet Resources (CIRs) was referenced in paragraph 58 of the Tunis Agenda: “We recognise that Internet governance includes more than Internet naming and addressing. It also includes other significant public policy issues such as, inter alia, critical Internet resources, the security and safety of the Internet, and developmental aspects and issues pertaining to the use of the Internet.” Within this respect, CIRs are usually referenced as:

- Internet Addressing
- Internet Naming
- Internet Root Name Servers and Internet Root Zone

1. Internet Addressing:
Internet Addressing or what is commonly known as the Internet Protocol Number (IP#) is a numerical label that is assigned to any device linked to a computer network or the Internet. It is part of the Internet protocol known as TCP/IP and it serves two main functions: identification of the host (a computer) and location addressing (where it is in the network). Currently there are two versions of Internet addressing, Internet Protocol Version 4 (Ipv4), a 32 bit number, which is the original version that is used until now to connect to the Internet. Due to the enormous growth of the Internet, only 7% is remaining out of the total volume for this version and it is expected that it will be depleted somewhere between the end of 2011 and the first half of 2012. In order to meet the growth in demand for the Internet, a new version known as Internet Protocol Version 6 (Ipv6), a 128 bit number, was developed and standardized in 1998. This version has entered the deployment phase and it is used today for Internet addressing. There are different opinions with regard of the existence of the two versions, some believe that Internet addressing is in a transitional phase between the two versions while others believe that the two versions will exist for a long period of time.
Internet protocol numbers are assigned and allocated as a resource by the Regional Internet Registries (RIRs), which are independent technical organizations responsible for the management of Internet numbers as a resource. The RIRs functions based on geographical regions, currently there are 5 RIRs:

- African Network Information Centre (AfriNIC) for Africa
- American Registry for Internet Numbers (ARIN) for North America
- Réseaux IP Européens - Network Coordination Centre (RIPE NCC) for Europe, the Middle East, and Central Asia
- Asia-Pacific Network Information Centre (APNIC) for Asia and the Pacific region
- Latin American and Caribbean Internet Addresses Registry (LACNIC) for Latin America and the Caribbean region

In 2003, the RIRs created an unincorporated organization called the Number Resource Organization (NRO) to undertake and coordinate joint activities (projects) and global policies. AfriNIC was the last to join this organization in 2005 after it was established in 2004. The RIRs are independent technical bodies that are governed in a bottom up approach by their respective membership base. Each one of them has its own policies and procedures that organize its functions.

2. Internet Naming:
Internet Naming or Domain Names as they are commonly known identifies an Internet protocol resource such as a web site. Individual Internet host computers use domain names as host identifiers or hostnames. They are structured based on what is known Uniform Resource Locators (URLs) (such as www.un.org) which are used to identify an Internet resource like web sites.

Internet Naming or Domain Names are managed by a Domain Name System that acts as an Internet Directory by translating domain names or hostnames that are readable human friendly into an internet address (Internet IP #). The Domain Name System (DNS) is a hierarchical naming system built on a distributed database for computers, services, or any resource connected to the Internet. The Domain Name System makes it possible to assign domain names to groups of Internet resources and users in a meaningful way independent of each entity's physical location (or address).

Currently there are two types of first-level Domain names known as Top Level Domains (TLDs):
- Generic Top Level Domains (gTLD): such as .com, .net, .org and similar.
* Country Code Top Level Domains (ccTLD): Such as .sa for Kingdom of Saudi Arabia, .eg for Republic of Egypt, .kw for the State of Kuwait and similar. The ccTLDs are based on the ISO 3166 standard.

Internationalized versions of the domain names known as Internationalized Domain Names (IDNs) have been launched and currently operational for ccTLDs in some languages like Arabic, Russian, and Chinese (among other languages). IDNs for gTLDs are expected to be launched in the near future.

Each TLD usually have a registry which is an entity or a company that manages the TLD (such as verisign for .com). A registry assigns registrars (such as Network Solution) to process registration of domain names within a registry for clients or internet users (known as the registrant). Currently there are more than 196 million active registered domain names on the Internet.

### 3. Internet Root Name Servers and Internet Root Zone

The Internet root zone is the top-level DNS zone in a Domain Name System (DNS) hierarchy. It refers to the root zone of the largest global DNS. The top of that hierarchy is the root domain which contains all top-level domains of the Internet. A root name server is a name server for the Domain Name System's root zone; the root servers hold the lists of names and addresses for the authoritative servers for all of the top-level domains. The root name servers are a critical part of the Internet because they are the first step in translating (resolving) human readable host names into IP addresses.

There are 13 root name servers existing today starting with letter A and ending with letter M. This does not mean that there are physically 13 servers. Actually each operator of a root name server uses redundant computer equipment to provide reliable service in case of a failure in hardware or software occurs. Nine of the root name servers operate in multiple geographical locations using a routing technique called anycast, providing increased performance and improving fault tolerance. Ten of the root name servers are located in the United States. The other three are: (K) located in Amsterdam, (I) located in Stockholm and (M) located in Tokyo. The list of the root name servers and their operators are listed below:

<table>
<thead>
<tr>
<th>Root Name Server</th>
<th>Operator</th>
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<tbody>
<tr>
<td>A</td>
<td>VeriSign</td>
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<tr>
<td>B</td>
<td>USC-ISI</td>
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<tr>
<td>C</td>
<td>Cogent Communications</td>
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<td>D</td>
<td>University of Maryland</td>
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<td>E</td>
<td>NASA</td>
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<td>F</td>
<td>Internet Systems Consortium</td>
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<td>G</td>
<td>Defense Information Systems Agency</td>
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<tr>
<td>H</td>
<td>U.S. Army Research Lab</td>
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<tr>
<td>I</td>
<td>Autonomica</td>
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4. Organizational Dimension:
The discussion of CIRs within the context for Internet Governance cannot take place without discussing the role of the organizations that oversee, manage or administer CIRs. There are 3 key organizations that play a major role when it comes to issues related to Internet governance. They are: ICANN, IANA, and ITU.

4.1 The Internet Corporation for Assigned Names and Numbers (ICANN)
A non-profit corporation headquartered in Marina del Rey, California, United States. The ICANN mission is to coordinate, at the overall level, the global Internet's systems of unique identifiers, and in particular to ensure the stable and secure operation of the Internet's unique identifier systems. In particular, it coordinates the allocation and assignment of the three sets of unique identifiers for the Internet, which are Domain names (forming a system referred to as “DNS”), Internet protocol (“IP”) addresses, autonomous system (“AS”) numbers; and Protocol port and parameter numbers. It also coordinates the operation and evolution of the DNS root name server system as well as coordinates policy development reasonably and appropriately related to these technical functions. Based on this all what have been mentioned above as CIRs are under the umbrella of the ICANN.

The mandate of the ICANN comes from the US government through the US Department of Commerce (DOC). A Memorandum of Understanding (MOU) is signed between the US Department of Commerce and the ICANN that set up the relationship between ICANN and the US government. Based on this MOU the ICANN is required to operate in a bottom up, consensus driven, democratic manner. The Current MOU known as the “AFFIRMATION OF COMMITMENTS” was signed in September 30, 2009. Although that this MOU allowed for the first time parties other than the US government to review the work of the ICANN (including members of foreign governments), the status of the ICANN has been questioned as non-profit corporation "for charitable and public purposes" under the California Nonprofit Public Benefit Corporation Law. Many believe that the ICANN is a US organization that should be internationalized to become a world organization under the umbrella of the international community. Many regard the Internet and its current structure including the ICANN under the unilateral control of a single government (The United States of America).

The ICANN is made up of a number of different groups, each of which represent a different interest on the Internet and all of which contribute to any final decisions that ICANN's makes.
There are three “supporting organizations” that represent:

- The organizations that deal with IP addresses
- The organizations that deal with domain names
- The managers of country code top-level.

There are four “advisory committees” that provide ICANN with advice and recommendations. These represent:

- Governments and international treaty organizations
- Root server operators
- Those concerned with the Internet’s security
- The “at large” community, meaning average Internet users.

Finally, there is a Technical Liaison Group, which works with the organizations that devise the basic protocols for Internet technologies.

4.2 Internet Assigned Numbers Authority (IANA)

The IANA is a technical organization that oversees global IP address allocation, autonomous system number allocation, root zone management in the Domain Name System (DNS), media types, and other Internet Protocol-related symbols and numbers. It is operated by the ICANN under a separate contract with the US Department of Commerce. In another way, the IANA performs all the technical work of the ICANN.

IANA is broadly responsible for the allocation of globally-unique names and numbers. For Internet addressing, it delegates allocations of IP address blocks to regional Internet registries (RIRs) whom, in turn, each allocates addresses for a different geographical area of the world. For Internet naming, the IANA administers the data in the root nameservers, which form the top of the hierarchical DNS tree. This task involves liaising with top-level domain operators, the root nameserver operators, and ICANN's policy making apparatus.

Many are concerned that the IANA as a worldwide resource managed by the ICANN is being controlled by U.S. interests, a number of proposals have been brought forward to decouple the IANA function from ICANN. In the contrary, others believe that it would be impractical to change the current control structure without risking fracturing the Internet.

4.3 The International Telecommunication Union (ITU)

Founded in 1865, the ITU is an agency of the United Nations which regulates information and communication technology issues. ITU coordinates the shared global use of the radio spectrum, promotes international cooperation in assigning satellite orbits, works to improve telecommunication infrastructure in the developing world and establishes worldwide standards.
ITU also organizes worldwide and regional exhibitions and forums, such as ITU TELECOM WORLD, bringing together representatives of government and the telecommunications and ICT industry to exchange ideas, knowledge and technology.

The ITU is active in areas including broadband Internet, latest-generation wireless technologies, aeronautical and maritime navigation, radio astronomy, satellite-based meteorology, convergence in fixed-mobile phone, Internet access, data, voice, TV broadcasting, and next-generation networks.

The ITU states that its mission is to enable the growth and sustained development of telecommunications and information networks, and to facilitate universal access to the emerging information society and global economy. The ITU assists in mobilizing the technical, financial, and human resources required by such development. A major priority of the ITU is bridging the so-called "digital divide" by building adequate and safe information and communication infrastructure and developing confidence in the use of cyberspace through enhanced online security.

Although the ITU do not control the operation of the Internet, its work as stated above tremendously affects the usage and access to the internet specifically in areas like technology, frequency regulation, and standardization. Unlike the ICANN, the ITU membership is open for governments (currently 191 member states). Private organizations like carriers, equipment manufacturers, funding bodies, research and development organizations and international and regional telecommunication organizations, can join ITU as Sector Members. ITU has four sectors: Radiocommunication (ITU-R), Standardization (ITU-T), Development (ITU-D), and ITU TELECOM. The absence of some stakeholders from the membership base of the ITU like civil society and the way it is bound to its charter, bylaws, internal procedures and intergovernmental process, made the ITU in some views as lacking the dynamics it needs as an organization to deal with issues related to Internet governance.

4.4 Internet Engineering Task Force (IETF)

The IETF develops and promotes Internet standards. It cooperates closely with the W3C and ISO/IEC standards bodies and deals 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 managers are volunteers. IETF publishes its work in memorandums that are called Request for Comments (RFCs) which describes methods, behaviors, research, or innovations applicable to the working of the Internet and Internet-connected systems. Adopted RFC becomes Internet standards.

The IETF is formally part of the Internet Society (ISOC). The IETF is overseen by the Internet Architecture Board (IAB) which provides architectural oversight, oversees its external relationships, and oversees relations with the RFC editor.
Since the IANA is broadly responsible for the allocation of globally-unique names and numbers that are used in Internet protocols and are published as RFC documents, it maintains a close liaison with the Internet Engineering Task Force (IETF) and RFC Editorial team in fulfilling this function. IANA administers many parameters of IETF protocols. The IANA is chartered by the Internet Society (ISOC) to act as the clearinghouse to assign and coordinate the use of numerous Internet protocol parameters.

**Proposed Questions:**
1. Is the Current structure of Managing CIRs is to the benefit of Arab Countries or not.
2. What Interest we have that we need to pursue or protect regarding CIRs.
3. Do we need to play a bigger role within CIRs, Can the current structure allows us to do so.
4. In what context we need to address the issues related to CIRs on regional or national levels in the Arab World.
5. What should be the role of stakeholders (Governments, Private Sector, Civil Society and International Organizations) in the Arab World with regard of CIR.