

ccTLD as the backbone of the information society in African countries

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Agenda

- What is Information Society (IS)?
- Internet infrastructure
- Domain Name System
- Critical Internet Infrastructure
- Role of ccTLD in Achieving IS
- Challenges to IS
- Conclusion

What is Information Society?

- An **information society** is a **society** in which the creation, distribution, diffusion, use, integration and manipulation of **information** is a significant economic, political, and cultural activity.
- Information Technology has central position for production **economy**, and society at large
- Currently no universally accepted concept of what exactly can be termed information society
- Information technology is not only **internet**

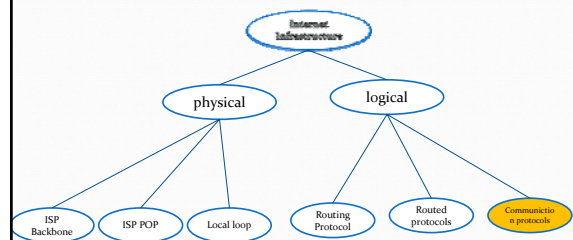
Information Society

- Vital for computers, mobiles and Internet to function well and provide access to many services in all fields of our lives
- Technologies and Internet has become significant; So our dependence on underlying infrastructure
- Challenge of protecting cyberspace is vast, complex and requires effort by all
- Information sharing and coordination are crucial to improve our overall viability

Internet Infrastructure

- Different elements of Internet Infrastructure (II) are inter-related
- Definition of II may depends on the context
- Many logical and structural elements can be defined as part of II
- Basically, can be divided into two structures:
 - Physical
 - Logical

Internet Infrastructure



Domain Name System

- Communication protocol
- Has become phonebook of Internet
- Developed because growth of internet made it difficult to use IP to communicate – need for human readable form
- Internet can still function without DNS – but will be difficult to be used by humans

Critical Infrastructure

- “Critical Infrastructure (CI)” means those assets or parts which are essential for the maintenance of critical social functions, including the supply chain, health, security, economic or social well being of people.
- CI very broad concept
- Some elements of II are essential to Internet usable by whole world: Physical infrastructure? Routed Protocol?

Critical Infrastructure

- DNS not essential from that perspective
- However DNS has become essential for Internet users in their everyday life, services –email, WWW, Instant Messaging, voice and video chats etc..
- Using Internet without DNS will be harder
- DNS is critical resource for social, economic interactions by humans on the Internet, the bedrock of Information society

Role and function of ccTLDs

- ccTLD Registry
 - trustee for delegated ccTLD
 - Duty to serve local community
 - Performing domain allocation function in term of DNS
 - Duty to serve global community
- ccTLD registry Role
 - Two core functions
 - Entering and maintaining data into database (Data Entry Function)
 - Maintaining and ensuring upkeep of name-server for the ccTLD (name server function)

ccTLDs and IS

- Almost every Internet Application relies on responses from name servers – used in name resolution process to determine IP address of i.e. email server, web server etc
- All infrastructure have to be very efficient and reliable to end users.
- Queries must be answered in relatively short time of tenth ms.
- Data Integrity very important – incorrect or missing records could lead to communication issues

Challenges to ccTLD Registries element for IS

- DNS threat can be divided into two main categories
 - Data Corruption
 - Denial of Service
- Data Corruption threats
 - Attacker can change IP address of Name server
 - Non-Valid IP address could disable access to website
 - IP pointing to attackers private data – Seal customer Info
 - Many security Level of protection of Registry’s Database (Firewall, separate private networks (Apps & DB) , encryption)
 - DNSSEC is solution to Data corruption)

Challenges to ccTLD Registries element for IS

- Denial of Service Attack
 - Aim of DoS is to disable access to provided services by switching it off or making access unavailable
 - DDoS is example of DoS threat to Database
 - Attacks could lead to serious delays in responses and worse case consume all available bandwidth and interrupt Registry services
 - Anycast technology most popular way to defend against DDoS

Conclusion

- DNS is human interface to Internet
- Information Society requires people to interact with other people – DNS is critical resource
- ccTLDs manage the DNS infrastructure at the country level
- Challenges exist to Information Society if DNS is not managed securely
- An efficiently manage ccTLD is the key to a thriving Information Society!

Thank You
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