Building a Cyber Security Emergency Response Team for the NREN Community – The case of KENET CERT

Presentation at UbuntuNet-Connect 2015

19-20 November 2015, Maputo, Mozambique

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Transforming research & education using ICT

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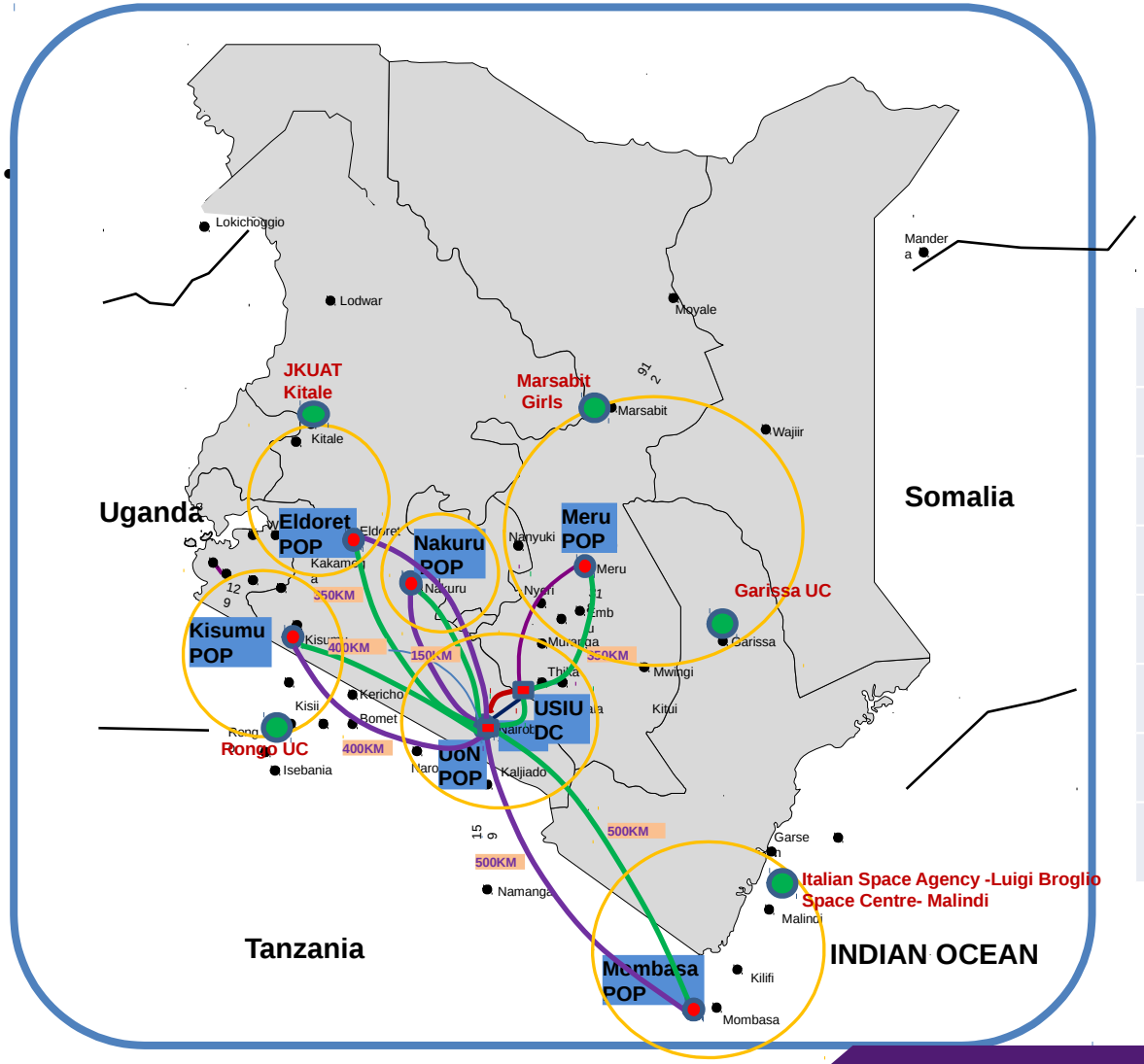
Agenda

- KENET as an NREN
- The KENET CERT
- Motivation
- Services
- Methodology
- Impact
- QA

KENET is the National Research and Education Network (NREN) of Kenya

- **Aggregates Demand for Connectivity, Internet bandwidth and Cloud Services of member institutions**
- **Aggregates Internet traffic from Higher Education and research institutions**
- **Develops High-end ICT talent** – technical + project management
  - Capacity building for KENET and member institutions
- **Builds and operates advanced research infrastructures** for the R &E **community of Kenya** in different areas
  - Africa Science Gateway and federated services (KENET CA, iDP, EDUROAM)
  - Special Interest Groups (SIGs) in Educational technology and Engineering Education constituted in FY 2014-2015
  - SIGs in Medicine, Agriculture and ICT shall be constituted in FY 2015-2016
  - *KENET focus is support for STEM education and research!*
- **Cyber Security**

KENET Operates a Broadband Network for Members



POP	Connected Campuses
Nairobi POP	72
Kisumu POP	21
Mombasa POP	10
Eldoret POP	15
Nakuru POP	11
Meru POP	17
Total Campuses connected	**170+**

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What is a CERT

- Computer/Cyber Security Emergency Response Teams (CERT)
- Expert groups that handle computer security incidents.
- Alternative names include computer emergency readiness team and computer security incident response team (CSIRT).

The KENET CERT

- The KENET CERT is a team within KENET formed to study Internet security, discover vulnerabilities, and to provide assistance on security matters to the KENET community.
- It strives for a safer, stronger Internet for the education and research community in Kenya by:-
  - Responding to major incidents
  - Analyzing threats
  - Exchanging critical cyber security information within the community and also with other CERTs.

Why setup a CERT at KENET

- Increase in cyber threats
  - ISPs in Kenya: spamming, phishing and poor reputation scores
  - Malware Threat: viruses, trojans, botnets and worms
  - Insider threats
  - Global Vulnerabilities and Threats
    - http://www.symantec.com/security_response/publications/threatreport.jsp

Why setup a CERT at KENET Cont ...

- High uptake of Internet and online applications
  - Need to secure these applications
  - KENET is distributing 9 Gb/s bandwidth to its members.
    - *4.5 Gb/s International traffic*
    - *4 Gb/s Google Cache*
    - *0.5 Gb/s Akamai traffic*
- KENET Shared services need to be secured
  - web hosting
  - backup services
  - data recovery sites
  - DNS services
  - cloud services and virtual servers.
- Computer security incidents response

KENET CERT Services

- Facilitate the centralized reporting of incidents
- Perform training and raise the security awareness of users
- Resolving security related tickets as part of the KENET help desk
- Promote computer security policies within the KENET community by creating policies such as the web hosting policy, business continuity plan etc
- Alerts and Announcements
- Collaboration
- Incident Tracing
- Securing the KENET infrastructure by ensuring that network devices and systems are hardened before they go live.

CERT Development Methodology

1. **Requirement Analysis and Specifications**
   - understanding KENET as an NREN and the community it serves
   - Identify threats
2. **Planning**
   - services to be provided by the CERT to mitigate threats identified
   - Benchmark with other CERTs e.g. DFN-CERT, US-CERT, FIRST
3. **Implementation**
   - Assembly of a team within KENET with both personal and technical skills of running a CERT
   - tools for vulnerability scanning were identified
   - Setup of a honeypot
   - Development of the CERT portal—http://cert.kenet.or.ke
   - Hardening of existing systems – Modsecurity, Mod_evasive, Host Firewalls, Maldetect

CERT Development Methodology Cont…

4. Operational phase

- Services implemented were launched to the community and a mailing list created (email and SMS)
- Cyber security training curriculum for systems administrators and a computer security awareness training for users were developed
- Policies and procedures for operationalization of the CERT were developed and communicated to the community
- CERT portal was put on line (https://cert.kenet.or.ke)

5. Peer collaboration

KENET CERT Organization Model

- Internal Distributed CERT model proposed by the European Union Agency for Network and Information Security (ENISA)
  - An organization utilizes existing staff to provide a “virtual” distributed CERT
  - The distributed team members perform CERT duties in addition to their regular responsibilities
  - Low cost incurred
- **Processes**
  - Incident Reporting
  - Incident Handling
  - Communication

CERT Implementation Challenges

- People who are trained and experienced in incident response techniques and practices are difficult to find.
- There is no established education path for professional incident handling staff in existence as of today.
- There was a lack of publicly available sample templates for policies and procedures for use in the day-to-day operations of a CERT.
- There were few tools such as tailored help desk or trouble ticket solutions addressing the specific needs of the KENET CERT.

Impact & Conclusion

- Four Training have been conducted.
  - Better awareness, better setup of systems and a better knowledge of security threats and ways of mitigating these threats.
  - A session on security has been included in all other KENET trainings.
- Information is disseminated in a timely manner.
- Quick resolution of security related tickets because best practices have been identified, procedures developed and documented for the CERT team to follow during resolution.
- Reduction in the number of cyber security tickets
- Awareness and Discussion within the KENET community on cyber security is stronger now
- KENET has established Cyber security champions in each of its member institutions.

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Thank You

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