

# Building National and Regional Cybersecurity Competences through the UbuntuNet Alliance NRENS

*UbuntuNet Connect 2015*

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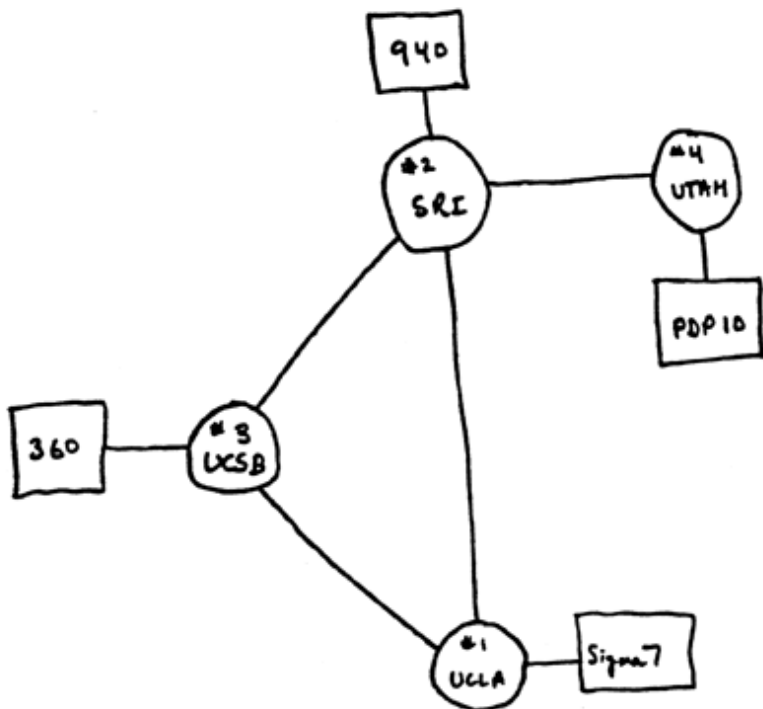


# Outline

- *Background*
- *Current reality 1—improving connectivity and networks*
- *Current reality 2—increasing number and sophistication of attacks*
- *Current reality 3—we have barely started in terms of cybersecurity readiness*
- *NREN response*

# Backdrop

ARPAnet, 1969



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**TCP/IP**  
(Vint Cerf and Bob Khan)



**The two together – Internet**

***It was then and still is about resilience***





# *Critical Infrastructure*

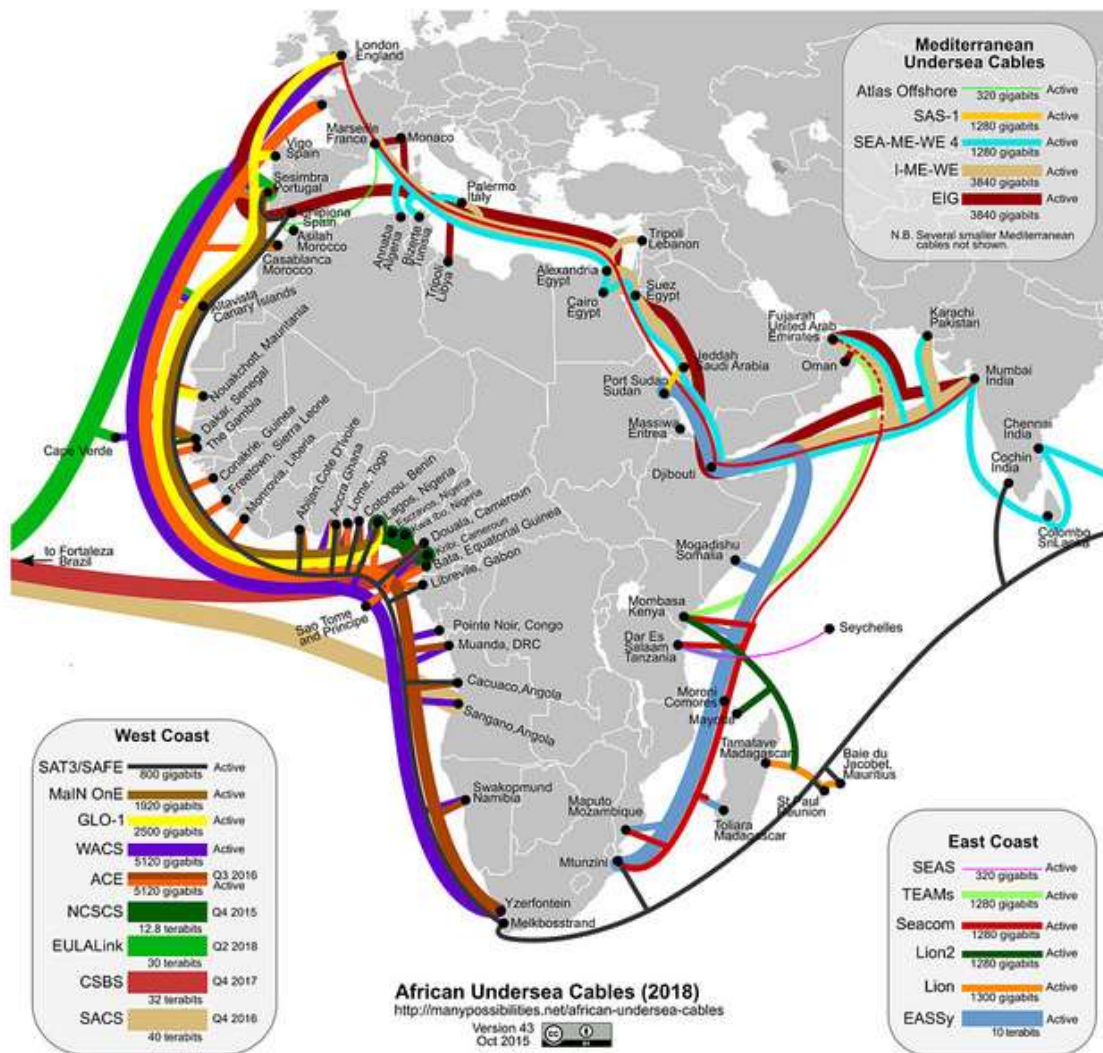


**Current reality (1):**

**Networks are improving and more people and things are getting connected**

# Growing Connectivity

African connectivity is growing exponentially fuelled by the mobile revolution and the arrival of more optic fibre at different coastal locations



# 52%

3G connections to increase from 15% of total in 2013 to 52% by 2020

# 525M

By 2020 there will be 525M smartphones, up from only 72M at end of 2013

# Mobile subscribers and connections

More people and things are getting connected



2013

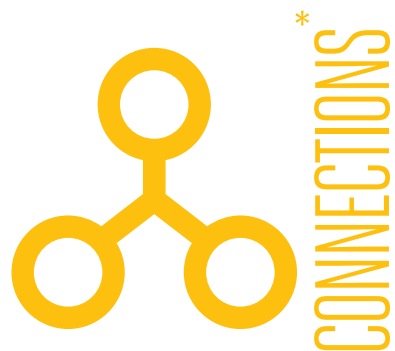
311M

36% PENETRATION RATE

2020

504M

49% PENETRATION RATE



2013

564M

65% PENETRATION RATE

2020

947M

91% PENETRATION RATE

\*Excluding M2M

**Current reality (2):**

**Attacks are increasing in volume,  
sophistication, and scale**

# Current reality (2)

*Attacks are increasing in volume, sophistication and scale*

**Records breached in first half of 2015**

**245,919,393**

**Number of breach incidents**

**888**

**Frequency of records lost or stolen**

**Every Day: 1,358,671**

**Every Hour: 56,611**

**Every Minute: 943**

Compared to first half of 2014, breaches have increased by

**+10%**

No. of compromised data records have declined by

**-41%**

# *Some examples of attacks*

*Affect a wide range of industries and sectors like banking and finance, healthcare, government, retail & trade, education, etc.*

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- Anthem Insurance (USA), Feb 2015, 78M records (state-sponsored, malicious outsider, identity theft breach)**
  - General Directorate of Population and Citizenship Affairs (Turkey), 2015, 50M records (malicious outsider, identity theft breach)**
  - US Office of Personnel and Management (USA), June 2015, 21M records (state-sponsored, malicious outsider, identity theft breach)**
  - Korean Credit Bureau (South Korea), 2014, 104M records (malicious outsider, identity theft breach)**
  - JP Morgan Chase (USA), Aug 2014, 83M records (malicious outsider, identity theft breach, largest-ever bank data breach)**
  - Stuxnet (Iran), 2010, malicious code attacked industrial control systems running specific combination of software and hardware**



*openness*

*ideas*

*debate*

*academic freedom*

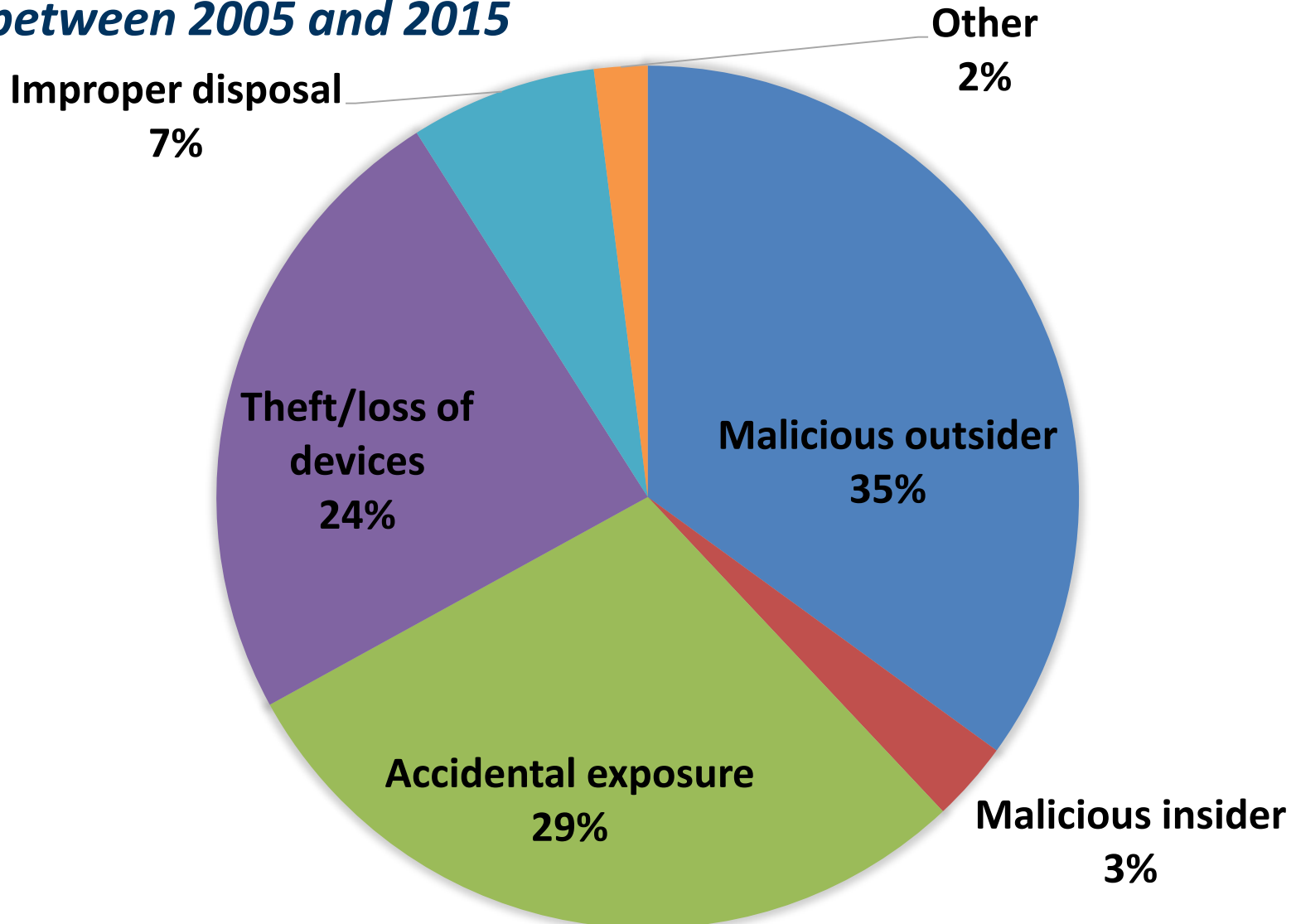
# ***Universities have also been targeted***

***Universities and other educational institutions have access to great deal of private information and repositories of research data***

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- UCLA (USA), 2014, 4.5M records (breached UCLA hospital network stealing personal and medical data)**
  - University of Chicago (USA), 2015, targeted student and employee data, exposing social security data**
  - University of Calgary (Canada), 2015 targeted employee data, modifying banking records leading staff to miss their pay cheques**
  - University of Connecticut (USA), 2015, discovered malware on server but unsure about extent of breach**
  - UC Berkley (USA), 2015, data breach targeting student financial data including bank account information**

# Sources of cybersecurity breaches

*Of 759 documented breaches amongst US educational institutions between 2005 and 2015*



**Current reality (3):**

**We are still on the starting block in terms of cybersecurity readiness**

**“Let me be clear that no single technology; or single government entity; alone can overcome the cybersecurity challenges our nation faces.**

**Cybersecurity must start with informed users taking necessary precautions and extend through a coordinated effort between the private sector, critical infrastructure owners and operators, and the extensive expertise that lies across coordinated government entities.”**

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**Deputy Under Secretary, Philip Reiting, National Protection and Programs Directorate,**

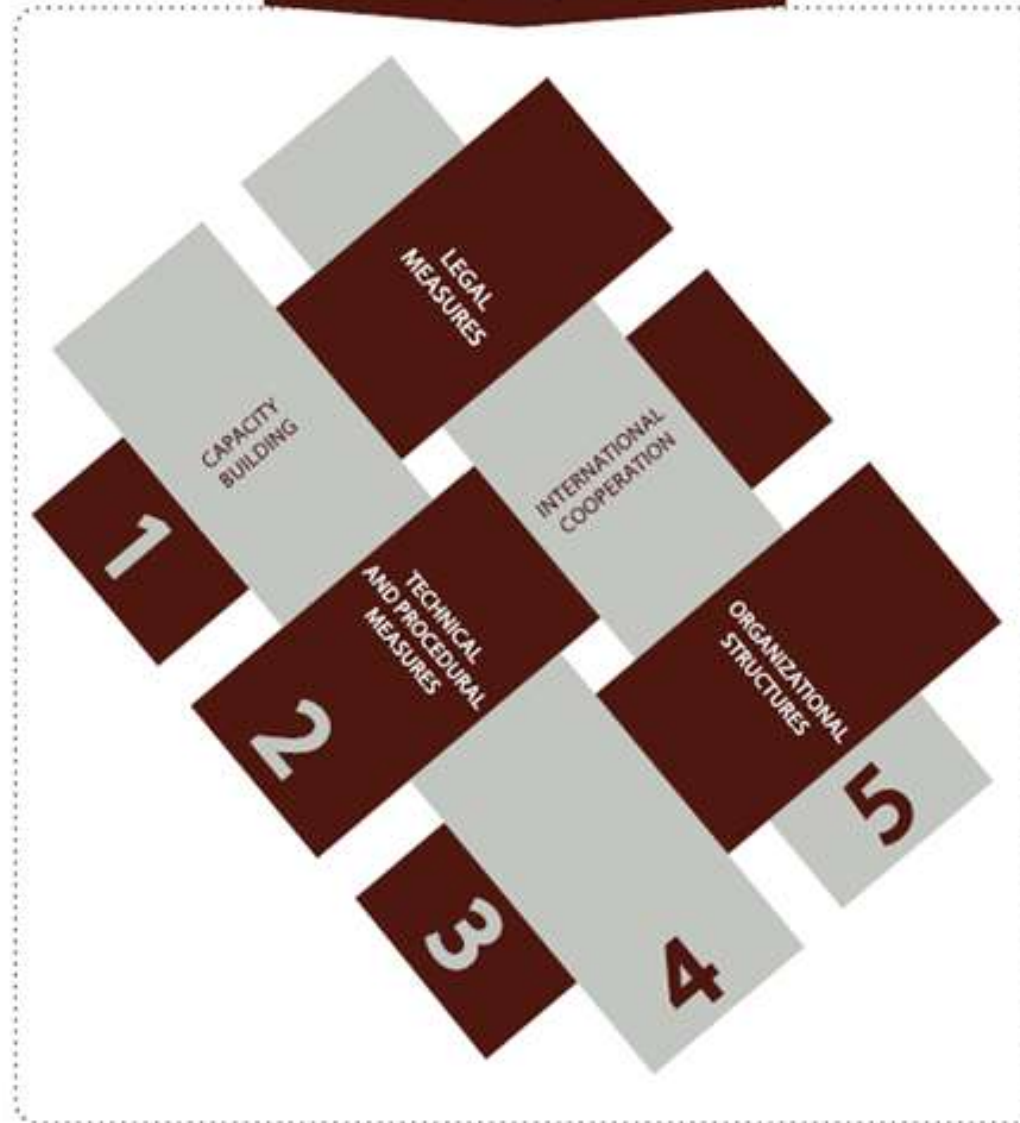
**United States House Committee on “Examining the Cyber Threat to Critical Infrastructure and the American Economy”**

***We have barely  
started to  
crawl***



# ITU Global Cybersecurity Agenda (GCA)

A five-part platform



# *Legal measures*

- *The African Union adopted a new convention—the Convention on Cyber Security and Personal Data Protection in June 2014 to help harmonize cyber legislation on address cyber crime, personal information protection and ecommerce activities*
- *To date, the convention is yet to be ratified by any member country*
- *8 out of 15 UA members have varying degree of cybercrime and related legislation in place*

# Other measures

- *Only KENET currently operates a CERT or CSIRT at the NREN level as a sector CIRT for academic institutions*
- *Only 7 members have established officially recognized national level CERTs. These include Kenya, Rwanda, South Africa, Sudan, Tanzania, Uganda and Zambia*
- *Only 4 (Rwanda, South Africa, Sudan and Tanzania) have developed officially approved national or sector specific cybersecurity frameworks or standards for implementing internationally recognized cybersecurity standards*
- *Uganda has only CERT that has been certified under internationally recognized standards in cybersecurity*
- *Kenya, Rwanda and South Africa have officially recognized programs for sharing cybersecurity assets and information across government agencies or between public and private sector entities to enhance collaboration*

## **Our response: *If NOT the RENs, then WHO???***

- **What is in our immediate capacity to do and how?**
- **What is in our capacity to influence and how?**
- **Looking to the future**

# ***What is in our capacity to do now?***

- ***Constitute a loose team of cybersecurity professionals across member institutions into an NREN-CERT that can provide services to NREN member institutions on a voluntary basis***
- ***Organize technical training to develop necessary capacity and acquire the resources needed to nurture a local community of cyber security professionals***
- ***Engage and collaboratively define reasonable application security protocols that all members need to implement***
- ***Design training programs that members can use to build and improve security awareness of their student and staff users***
- ***Equip and support member institutions in conducting periodic in-house risk assessments on University information systems to evaluate their current security posture to identify and remedy vulnerabilities***

# *What is in our capacity to influence?*

- *Support member institutions to develop comprehensive ICT security policies and incident response plans*
- *Seek support and training from other developed NRENs and RRENs around the world in order to build more capacity*
- *Collaborate at regional level to create an UbuntuNet Alliance CERT (UA-CERT) that facilitates incident triage, coordination and resolution; training as well as awareness creation amongst different constituencies*
- *Nurture a wider group of cybersecurity professionals across the region. This may entail developing a curriculum, events, workshops and conferences that bring such people together*

# *Looking to the future*

- *Engage with regional and global organizations that bring together CERTs e.g. AfricaCERT, Forum of Incident Response and Security Teams, International Cyber Center, etc.*
- *Lobby for the creation of appropriate regulatory and legislative environment within each of our countries*
- *Cyber insurance to mitigate economic impact of a potential attack*

**Obrigado**

# Backup Slides

# Growth in mobile data traffic

Source: Ericsson

Mobile data traffic in Sub-Saharan Africa  
(monthly Terabytes)

