Security and Reliability in the Broadband Network

*Building an **Assured Infrastructure***

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April 18, 2011
Agenda

Why is security essential to a public broadband network? (Chris Janson)
- Definition of an assured network
- Needs of public broadband networks
- Trusted, reliable and secure
- Elements of the assured network

CERN experiences with L1 protection and mesh restoration (Artur Barczyk)

Network Security (Bob Kimball)
Information is increasingly important to society—and increasingly important to protect.

For government
- Proprietary email
- FAX & voice

For industry
- Internet email
- Corporate web
- Paging, FAX, Voice
- eCommerce

For society
- Mobile internet
- IM, texting
- Social media, personal web
- eEverything

Incidents / threats
- IRA car bombs London
- US embassy in Peru attacked

2000
- Denial of Service web attack
- Spam, Malware, Viruses common
- Sept 11, 2001

2010
- Cloud
- SAAS
- IAAS
- PAAS
- Server virtualization
- Smart Grid
- eHealth
- eFinance
- eGovernment
- eEverything

2020
- Combined script language attacks
- 88% of incoming email is spam
- WikiLeaks cyber attacks
- Cyber Militias reported
All networks are at risk

Cyber Threats are Escalating

Secured Solutions
Encryption and authentication to prevent unauthorized access

Reliability
More than redundant power supplies and fiber rings

Trusted Supplier
What’s in that network element?
Address the threat with an **assured** network
Public broadband networks must be assured networks

State & Local Government
- transparency
- confidentiality
- efficiency

Hospitals/ Health clinics
- universal access
- confidentiality (HIPPA)
- dependability

K-12 and higher education
- capacity, speed
- universal access
- efficiency

Rural Communities
- universal access
- ‘broadband’ compliant
- Fundamental infrastructure

Mobile/Public Safety
- dependability
- inter agency collaboration
- confidentiality (HIPPA)

Highly accessible but carefully protected and reliable
A few thoughts about trusted supply.......... 

MalWare and Trojans prompted US DoD to push for establishment of industrial trusted supply chain 

- Open Group trusted technology forum- studying design and manufacturing best practices: likely future accreditation process 
- Charter members: DoD, IBM, Microsoft, HP, others

US Defense leads the trend: National Cyber security element 

- Quickly will be demanded by government, industry and private entities

As standards emerge, industry needs to lead 

- Selection and control of their supply chain 
- Compliance with existing standards (eg JITC, common criteria, etc) 
- Verification by independent agencies 

Trusted Supply implies holistic threat protection 

- Includes natural disaster contingencies
Global Supply Chain for Diversity

With Key Transformations Done in North America

Validated by Independent Labs and Key Customers
Reliable
Operators must prepare for uncontrollable events.....

Equipment Failure

Natural Disasters

Fiber Cuts

Terrorism

Power Outages

Solution: Mesh restoration
- Highly resilient meshed architecture minimizes downtime
- Restore connections on end-to-end basis independently of underlying linear and ring protection

Operational advantage: Six 9’s reliability – ultra-high availability
Secure

The Headlines Tell the Story:

- Denial of Service Attacks
- Unauthorized Access
- Cyber Warfare
- Privacy concerns
- ID theft

Solution: Assured Networking

- Line-rate encryption
- End-to-end connection and performance monitoring
- Consistent connection admission control / authentication
- MAC/VLAN filtering
- Broadcast containment/isolation
- Deterministic route control
Elements of a public assured broadband network

1. Trusted platform
2. Reliable design
3. Secure deployment

Highly accessible but carefully protected
Summary

Anchor institutions need more than just high speed connectivity

- Broadband is fundamental community economic infrastructure
- Network faces increasing threat levels

Network must be invisible and impenetrable

- High speed, low latency
- Dependable
- Trusted and secure

Built upon trusted technologies

- Mesh restoration, 100G OTN, Carrier Ethernet
- Secured through encryption
• Experiences with Mesh restoration: Artur Barczyk- CERN

• Security in the public broadband network: Bob Kimball- Ciena