Physical Security for Network Operators

Securing the Tangibles

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Target Audience

5-200+ cabinets/site colocated with a data center provider

Security focused
Overview

1. Cage/Cabinet Access and Monitoring
2. Circuit Encryption
3. Encryption Key Management
4. Encryption at Rest
5. Vendor Access
Cage/Cabinet Access and Monitoring

- Build with the approach of secure concentric enclaves within datacenter down to your cabinet
- Cameras everywhere – separate infrastructure by you and the DC
  - Store offsite
- Locked doors on cabinets within cages
- Key card every perimeter
- Door sensors everywhere in cage
  - Magnetic reed switches back to dry contact sensors w/ syslog or SNMP traps work great
  - Audit logs
  - Trust but verify – have your vendors show you proof of records and video
Circuit Encryption

- It’s easy to do AES256 encryption at 100G or 10G today
- Arista, Adva, Others..
- IPSEC/Application Layer (TLS) everything else
- Consider encrypting every circuit outside of DC, and if risk requires, inside
- Special transport circuit types required for some(all?) encryption OTU4e
Encryption Key Management

- Roll your keys periodically
- Store canonical keys in HSM
- Require 2FA/MFA where plausible
- Store all keys encrypted; 1Pass; gpg, openssl, JCE
- Require N of M for changes/extraction
- Shamir’s Secret Sharing Scheme is good
- Make it a priority to immediately change default passwords
Encryption at rest

- Many ways to ensure security of data
- All disk drives that store secrets, proprietary IP, PII, or Customer Data should generally be encrypted at rest; requiring explicit unlock at power on.
  - TCG/OPAL Protocols
  - Your choice depends on your threat model
- Can encrypt at many levels
  - Physical disk
  - Volume Level
  - Application Level
- A key management system relying on back-end HSM like StrongKey, Safenet, Thales or others can do this.
- Some data may require application encryption.
- If your strategy involves interacting with Government, review cryptography requirements in advance
Vendor Access

- Avoid it whenever possible
- Escort Vendor at all times
- Do not allow them to handle equipment or modify configurations
- Remote tech support through “View only”
- On-site tech support to inspect and advise, not effect change
Thank you