Root Zone DNSSEC Deployment

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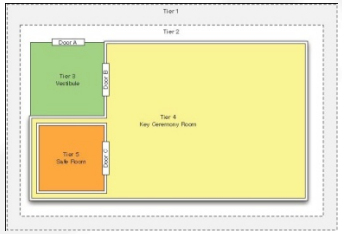
This design is the result of a cooperation between ICANN & VeriSign with support from the U.S. Department of Commerce NTIA and National Institute of Standards and Technology (NIST)

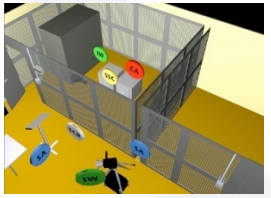
High Level Design

- **Trust / Integrity**
  - **Transparent operations**
  - **Direct public participation in key management**
  - **3rd party Audit**
- **Security**
  - **Crypto**
  - **Physical**
  - **ID / ACS / multi-person access and control**
- **Availability**
  - **Sufficient time to perform operations**
  - **Mirror sites**
  - **Disaster recovery plan**

Implementation and Roll-out

- Publish all material (film, scripts, s/w, results.. http://www.iana.org/dnssec)
- DNSSEC Practices Statement (DPS)
- 21 Trusted Community Representatives (TCR)
- SysTrust audit by PWC
- 2048 KSK, 1024 ZSK RSA keys; SHA256 hash
- FIPS 140-2 Level 4 HSM; 3-of-7 TCR to enable; Good RNG
- Multiple physical tiers /w multi-person anti-passback access control system
- 9 gauge stretched metal ceremony room construction; Safes certified to 20 hours surreptitious entry
- 24x7 monitoring: motion, seismic, video, guards
- ~60 day window to perform quarterly operation; 15 day signature validity periods
- Mirror sites in Los Angeles and Washington DC; 2 HSMs at each site
- Documented Disaster Recovery (DR) plans
- Incremental deployment with DURZ and extensive monitoring





Challenges

- Finding out what are “best practices”
- Embracing an audited IT security mindset
- Formalizing documentation of policy and procedures
- Contractors!!
- HSM/smartcards/PKCS11

Lessons Learned

- Identify your “customer” and then your risks first
- Develop and document policies and procedures, e.g., key management, DPS, scripts, DR plan – and institutionalize them
- Embrace PKCS11 and tamper evident bags
- Multiple compensating controls

- DNSSEC deployment does not have to be expensive; Learn from those on this panel and share our experiences.
- This is not static; annual review and incorporate improvements from community.

Root DNSSEC Design Team

Thank You. Questions? (T)Ask me! Its my job.

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