Signing of the Root Zone

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DNSSec 101

- Cryptographic signing of the DNS data, so that the recipient can verify the integrity of the data
- Key Signing Key signs the Zone Signing Key which then signs the actual zone.
- Almost 15 years old Protocol, major traction in the last 3 years

Significance of the Root Key Signing

- The ‘DNS Root’ lies at the top of the DNS hierarchy.
- It’s probably the most natural trust anchor for signing of the DNS tree (*not all people agree*).
- A path for deployment of DNSSec more widely, as people no longer can claim that the hierarchy is incomplete

Signing Operations

- ICANN DNS Ops : http://dns.icann.org
- Root DNSSec: http://www.root-dnssec.org/
- KSK and ZSK split operations
  - ICANN does the KSK
  - Verisign does the ZSK
- Trusted Community Representatives (TCRs)

June 16, 2010

- First Key Signing Ceremony in Culpeper, VA
- What happened ?
  - Hardware Security Module (HSM) initialized
  - Seven Crypto Officers (CO) incorporated - *(I am one of them)
  - Seven Recovery Key Share Holders (RKSH) incorporated
  - Generate the KSK
    - Received the Key Signing Request from Verisign, containing the ZSK - signed them and returned the Signed Key Response, which will be used to sign the root zone by Verisign.
- A major Milestone

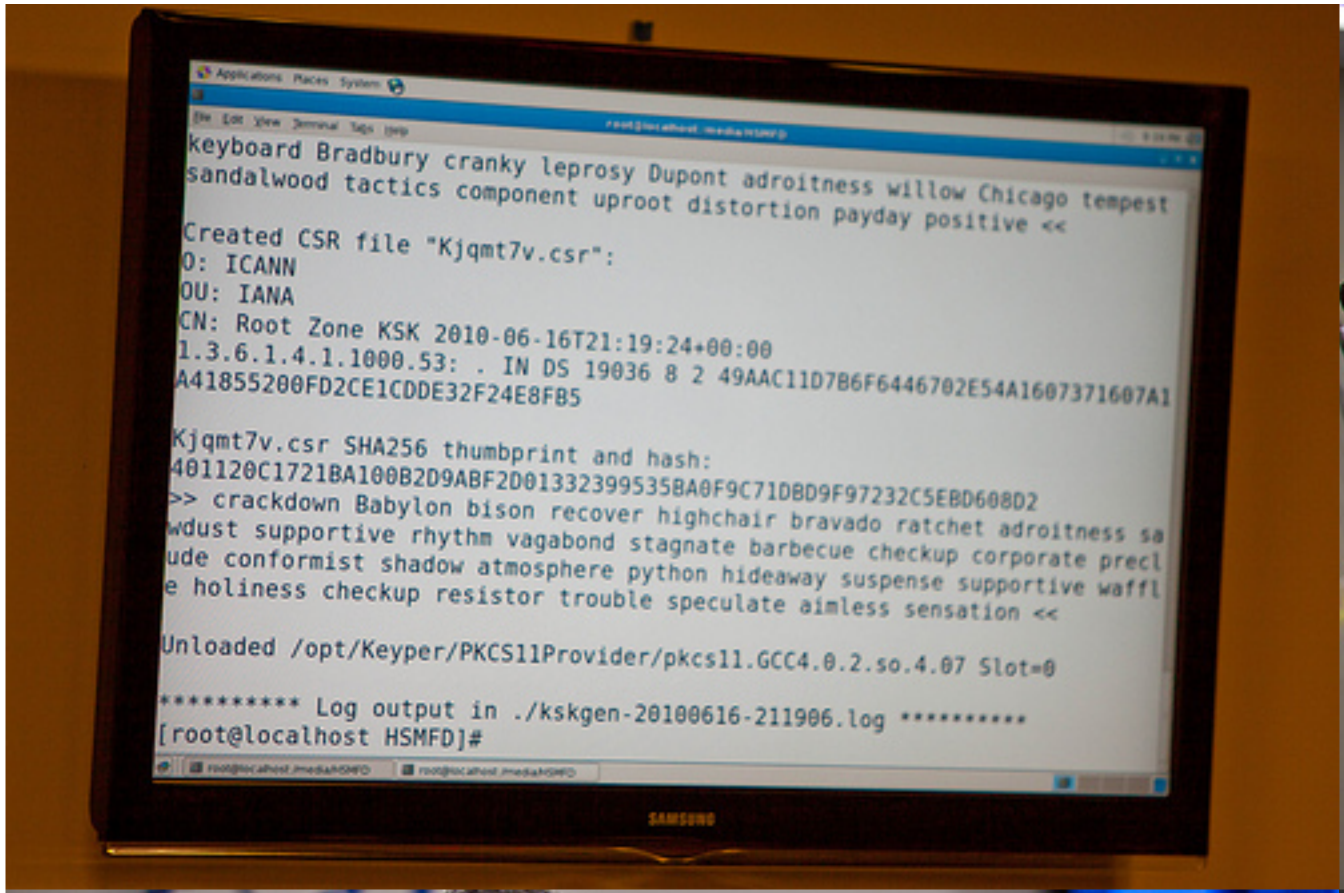
Signed Zone

- Second Key Signing Ceremony on 12th July in El Segundo, CA
  - Similar process as before, but no new key generated (same key as previously generated used)
- On 15th July, the root servers started serving the signed DNS Root Zone.

```
Starting: kskgen (at Wed Jun 16 21:19:06 2010 UTC)
Use HSM /opt/dnssec/aep.hsmconfig?
HSM /opt/dnssec/aep.hsmconfig activated.
setenv KEYPER_LIBRARY_PATH=/opt/dnssec
setenv PKCS11_LIBRARY_PATH=/opt/Keyper/PKCS11Provider/pkcs11.GCC4.0.2.so.4.07
Found 1 slots on HSM /opt/Keyper/PKCS11Provider/pkcs11.GCC4.0.2.so.4.07
HSM slot 0 included
Loaded /opt/Keyper/PKCS11Provider/pkcs11.GCC4.0.2.so.4.07 Slot=0
HSM Information:
    Label:            ICANNKSK
    ManufacturerID:   AEP Networks
    Model:            Keyper Pro 0405
    Serial:           K6002013

Generating 2048 bit RSA keypair...
Created keypair labeled "Kjqmt7v"

SHA256 DS resource record and hash:
. IN DS 19036 8 2 49AAC11D7B6F6446702E54A1607371607A1A41855200FD2CE1CDDE32F24E8FB5
>> deckhand pedigree snapline breakaway kickoff hemisphere flytrap detergent guidance c
oherence eating outfielder facial hurricane hamlet fortitude keyboard Bradbury cranky l
eprosy Dupont adroitness willow Chicago tempest sandalwood tactics component uproot dis
tortion payday positive <<

Created CSR file "Kjqmt7v.csr":
O: ICANN
OU: IANA
CN: Root Zone KSK 2010-06-16T21:19:24+00:00
1.3.6.1.4.1.1000.53: . IN DS 19036 8 2 49AAC11D7B6F6446702E54A1607371607A1A41855200FD2C
E1CDDE32F24E8FB5

Kjqmt7v.csr SHA256 thumbprint and hash:
401120C1721BA100B2D9ABF2D01332399535BA0F9C71DBD9F97232C5EBD608D2
>> crackdown Babylon bison recover highchair bravado ratchet adroitness sawdust support
ive rhythm vagabond stagnate barbecue checkup corporate preclude conformist shadow atmo
sphere python hideaway suspense supportive waffle holiness checkup resistor trouble spe
culate aimless sensation <<

Unloaded /opt/Keyper/PKCS11Provider/pkcs11.GCC4.0.2.so.4.07 Slot=0
```

Washington, DC 1101 New York Avenue NW, Suite 930 Washington, DC 20005 USA T +1 202 570 7240 F +1 202 789 0104
Brussels 6 Rond Point Schuman, Bt. 5 B-1040 Brussels BELGIUM T +32 2 234 7870 F +32 2 234 7848
Marina del Rey 4676 Admiralty Way, Suite 330 Marina del Rey, CA 90292 USA T +1 310 823 9358 F +1 310 823 8649
Sydney Level 2, 48 Hunter Street Sydney NSW 2000 AUSTRALIA T +61 2 8236 7900 F +61 2 8236 7913

http://icann.org



```
keyboard Bradbury cranky leprosy Dupont adroitness willow Chicago tempest
sandalwood tactics component uproot distortion payday positive <<

Created CSR file "Kjqmt7v.csr":
O: ICANN
OU: IANA
CN: Root Zone KSK 2010-06-16T21:19:24+00:00
1.3.6.1.4.1.1000.53: . IN DS 19036 8 2 49AAC11D7B6F6446702E54A1607371607A1
A41855200FD2CE1CDDE32F24E8FB5

Kjqmt7v.csr SHA256 thumbprint and hash:
401120C1721BA100B2D9ABF2D01332399535BA0F9C71DBD9F97232C5EBD608D2
>> crackdown Babylon bison recover highchair bravado ratchet adroitness sa
wdust supportive rhythm vagabond stagnate barbecue checkup corporate precl
ude conformist shadow atmosphere python hideaway suspense supportive waffl
e holiness checkup resistor trouble speculate aimless sensation <<

Unloaded /opt/Keyper/PKCS11Provider/pkcs11.GCC4.0.2.so.4.07 Slot=0

********** Log output in ./kskgen-20100616-211906.log **********
[root@localhost HSMFD]#
```

More info

- https://www.iana.org/dnssec/
- Various Tutorials at SANOGs

Thank you