

# DNSSEC in the root zone

## Signed TLDs

### The ARPA zones

RIPE 61  
Rome  
November 2010

Dave Knight



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# The project to sign the root zone

A cooperation between ICANN & VeriSign  
with support from the U.S. DoC NTIA



# ICANN

## IANA Functions Operator

- Manages the Key Signing Key (KSK)
- Accepts DS records from TLD operators
- Verifies and processes requests
- Sends update requests to DoC for authorization and to VeriSign for implementation

# DoC NTIA

U.S. Department of Commerce  
National Telecommunications and Information Administration

- Authorizes changes to the root zone
  - ▶ DS records
  - ▶ Key Signing Keys
  - ▶ DNSSEC update requests follow the same process as other changes
- Checks that ICANN has followed its agreed upon verification/processing policies and procedures

# VeriSign

## Root Zone Maintainer

- Manages the Zone Signing Key (ZSK)
- Incorporates NTIA-authorized changes
- Signs the root zone with the ZSK
- Distributes the signed zone to the root server operators

# Milestones

# 2009

- August
  - ▶ Project to sign the root formally announced
- October
  - ▶ The plan receives first public airing at RIPE 59
- December
  - ▶ <http://www.root-dnssec.org> site launched
  - ▶ First signed root zone created internally at VeriSign



# 2010

- January through May
  - ▶ Incremental roll-out of the DURZ to the root servers
- June
  - ▶ First ceremony in Culpeper, Virginia
    - Created initial root zone KSK
    - Processed initial KSR for Q3/2010
  - ▶ First DS records added to the root zone

# Key Ceremony Participants and Attendees



# 2010

- July
  - ▶ Second ceremony in Los Angeles, California
    - Key material from the first ceremony replicated and stored
    - Q4/2010 KSR processed
  - ▶ The fully validatable signed root zone is published to the root servers by VeriSign
  - ▶ The root zone trust anchor is published by ICANN

# 2010

- November
  - ▶ Third ceremony held in Culpeper, Virginia
    - KSR for Q1/2011 processed

# Root DNSSEC Design Team

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# The root is signed!

DNSSEC is now part of standard operations

# Upcoming ceremonies

- Ceremony 4 will be held in El Segundo, California February 7-8, 2011
- Ceremony 5 will be held in Culpeper, Virginia May 5-6, 2011

# DS Submission

- TLD operators can submit DS records to IANA for inclusion in the root zone
- Instructions
  - ▶ <http://www.iana.org/procedures/root-dnssec-records.html>



# Secured delegations

64 TLDs are now signed and 49 of those have DS RRsets in the root zone:

be bg biz br bz cat ch cz dk edu eu fi fr gi gov hn  
info lc li lk mn museum na nl nu org pm pr pt re  
sc se tf th tm uk us yt

...and 11 test IDNTLDs

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[http://stats.research.icann.org/dns/tld\\_report/](http://stats.research.icann.org/dns/tld_report/)

# ARPA

- ARPA has been signed since March
  - ▶ Expect to add a DS RRSet to the root zone shortly
- E164.ARPA signed by RIPE NCC since 2007
- Other ARPA children, with the exception of IN-ADDR.ARPA have been signed by ICANN since April
- DS RRsets for ARPA children in the ARPA zone since September

# Reverse zones

- ICANN and the RIRs have worked together to design a system to allow the RIRs to update DS RRsets in IP6.ARPA and IN-ADDR.ARPA
  - ▶ The effort to implement this system is underway now
- The RIRs and ICANN have deployed a new set of nameservers:
  - ▶ [A-F].IN-ADDR-SERVERS.ARPA
  - ▶ [A-F].IP6-SERVERS.ARPA

# IN-ADDR.ARPA

- Currently
  - ▶ Content managed by IANA
  - ▶ Zone edit function carried out by ARIN
  - ▶ Served on the root servers
- Edit function will move to ICANN in 2011
  - ▶ The zone will then be signed
  - ▶ Authority service will move to the new IN-ADDR-SERVERS.ARPA servers

# IP6.ARPA

- Currently
  - ▶ Served on servers operated by ARIN, APNIC, ICANN, LACNIC and RIPE NCC
  - ▶ Signed since April 2010
- Authority service will move to the new IP6-SERVERS.ARPA

# Questions?

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