DNSSEC

VeriSign Naming & Directory Services

ICANN Kuala Lumpur

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DNS Security Extensions (DNSSEC)

- DNSSEC uses public key cryptography and digital signatures to provide:
  - **Data origin authentication**
    - E.g., “Did this DNS response really come from *a.gtld-servers.net?”*
  - **Data integrity**
    - E.g., “Did an attacker—a man-in-the-middle—modify this DNS response?”
- Bottom line: DNSSEC offers protection against spoofing of DNS data

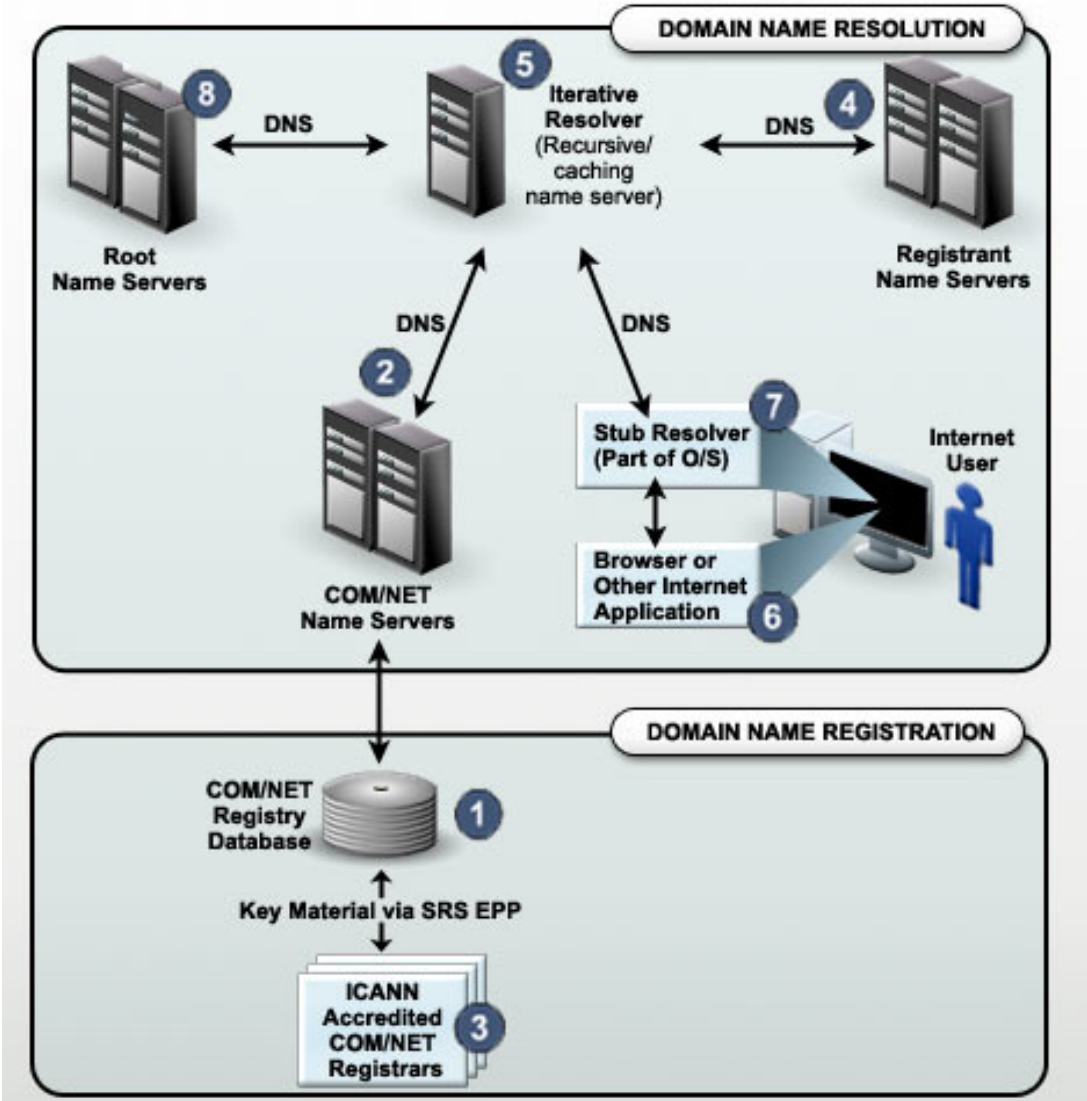
What DNSSEC Does Not Do

- DNSSEC does not:
  - **Provide any confidentiality for DNS data**
    - I.e., no encryption
    - Assumption: The data in DNS is public
  - **Address attacks against the name server itself**
    - Denial of service
    - Implementation vulnerabilities
    - Etc.

DNSSEC killer app(?): secure data store

- Spam mitigation
  - DNSSEC will not stop it outright but indirectly through output of IETF MARID WG
    - MARID WG focus is using DNS to ID valid originating mail senders
    - Focus of attack for spammers will then be to spoof DNS to get spam through
- Opportunistic encryption
  - Want to use IPSEC encryption with hosts but do not know key
  - Use DNS to store/retrieve the public key
- Secure shell
  - Use to find hosts' SSH public keys
  - Would replace caching mechanism that is in place today
- Tomorrow's applications….
  - Information store for secure routing information?
  - ??

Infrastructure Impacts of DNSSEC



Implementing DNSSEC in *com/net*

- Extensions to EPP supporting DNSSEC provisioning
- Update registry database to include DNSSEC-related information
- Acquire cryptographic hardware
- Define process to generate and maintain keys
- Implement incremental signing process
- Update zone file generation process
- Update ATLAS (authoritative name server platform)

DNSSEC Provisioning

- Registrant generates a public/private key pair for a zone
- Registrant signs the zone with the private key
- Registrant sends the zone's public key to the registrar
- Registrar sends registrant's key to the registry
- Registry puts registrant's key hash (DS) in the TLD zone
- Registry signs the TLD zone
- Registry publishes signed TLD zone

Pilot Programs

- www.dnssec.verisignlabs.com demonstrated Opt-In
  - Opt-In did not advance in the IETF and this pilot is now defunct
- www.dlv.verisignlabs.com demonstrates an alternative called DNSSEC Lookaside Validation (DLV)
  - Protocol extension developed by Internet Systems Consortium (BIND maintainers)
  - DLV uses third-party for authentication rather than standard DNSSEC's top-down model
- Comprehensive DNSSEC pilot for .Net
  - Ready in September
  - Participants make local change to access DNSSEC-signed version of .Net

DNSSEC Consortium

- Most DNSSEC deployment meetings have focused on:
  - Protocol deficiencies
  - Securing the DNS root
  - Deployment strategies
- The **DNSSEC Consortium** will be focused on:
  - Encourage application developers to design, develop and launch the most meaningful solutions demanded by the marketplace
  - Getting all the DNS players (registries, registrars, OS providers, DNS software vendors, application developers, etc.) together to:
    - Share views on DNSSEC
    - Share deployment plans
    - Coordinate rollout dates
    - Compile a library of APIs, white papers, best practice documents, etc
- First meeting in San Diego in August before IETF