What I Want for Eid ul-Fitr

An Operational ISP & RIR PKI

NANOG / Dallas

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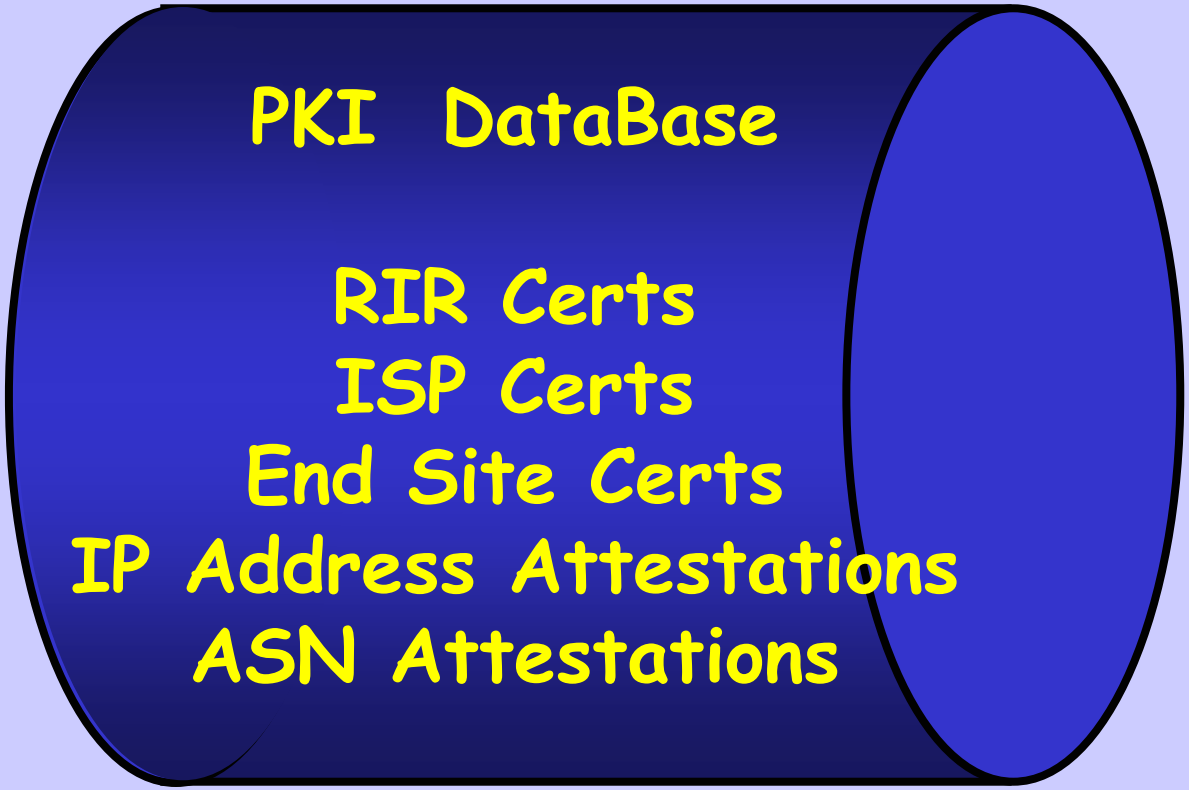
<http://psg.com/~randy/060214.nanog-pki.pdf>

Routing Security Gap

- Routing (not router) Security is a major problem
- See <http://rip.psg.com/~randy/060119.janog-routesec.pdf>
- The big gap is the PKI, storing and moving the certificates

Public Key Infrastructure



IP and AS Attestations

- Specifies identity == public key of recipient
- Signed by allocator's private key
- Follows allocation hierarchy
  - IANA (or whomever) to RIR
  - RIR to ISP
  - ISP to sub-ISP or end user enterprise

IP Allocation Example

- IANA allocates to RIR
  S.*iana* (192/8, *rir*)
- RIR allocates to ISP
  S.*rir* (192.168/16, *isp*)
- ISP allocates to User
  S.*isp* (192.168.42/24, *user*)
- Anyone can verify it all, because the public keys *iana*, *rir*, *isp*, and *user* are in the public PKI

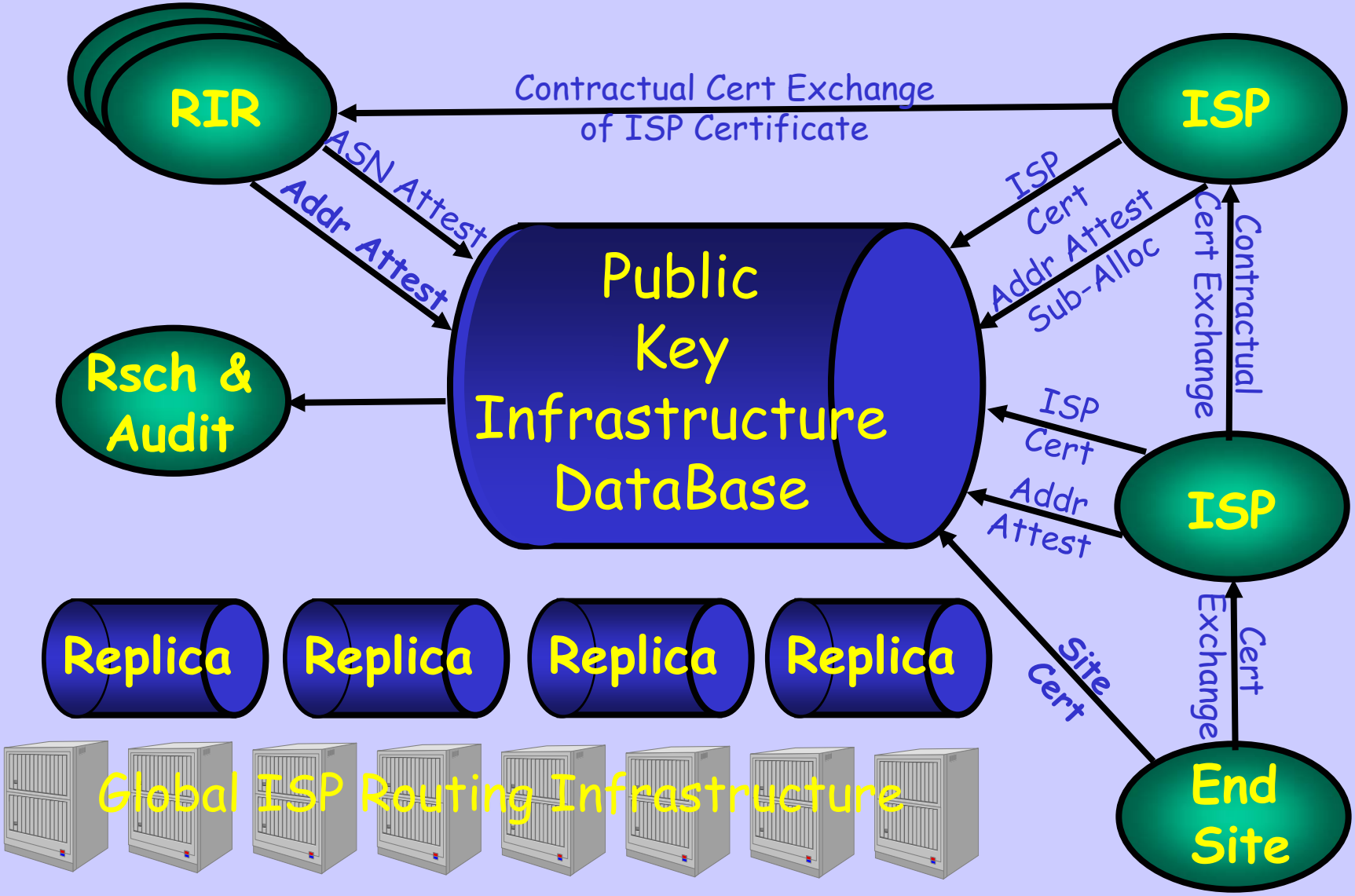
ISP / End-Site Certs

- May be acquired anywhere, Thawte, self-signed, …
- RIRs can issue as a service for members who don't get them elsewhere
- They need no attestation because they are only used
  - In business transactions where they are exchanged and managed by contract, or
  - Bound to IP or ASN attestations by the RIRs or upstream ISPs
- Big ISPs may use an ARIN identity for an APNIC allocation or business transaction

RIR Identity

- Similarly, RIR **identities** are their public keys, part of a cert
- They can get their cert from the 'above', RIR, NRO, IANA, or
- They can buy outside, or generate a self-signed cert, or …
- The harder issues are key rollover, revocation, …

PKI Interfaces/Users



Transacting with PKI

- RFC 2585 describes FTP and HTTP transport for PKIs
- Also describes interfaces and the transactions for publishing certs etc.
- The PKI is self-authenticating because it is just a bundle of certs
- So no need for transport security!

Tools for RIRs

- Generate and receive ISP certs
- Receive ASN and IP space attestations from *upstairs*
- Attest to allocation of Address Space and ASNs to ISPs
- Manage their own keys

Tools for ISPs

- Generate and/or acquire their own identity certs
- Generate and register role certs with RIRs and Upstreams
- Generate certs for sub-ISPs and End-User sites
- Attest to IP allocations to sub-ISPs and End-User sites

Some Open Issues

- Coordination of updates, one central repository is not operationally feasible
- LDAPv3 (RFC 3377) and RFC 2829 Authentication Methods for LDAP may address this issue
- Cert/key rollover and revocation
  - 'root' certs, e.g. iana or whatever
  - ISP certs

  May require a separate and secured communication channel

Wikipedia Says

Eid ul-Fitr (Arabic: عيد الفطر), often abbreviated as simply Eid, is an Islamic holiday that marks the end of Ramadan, the month of fasting. *Fitr* means "to break" and therefore symbolizes the **breaking of the fasting period and of all evil habits**.

This year it will be about October 24

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Steve Bellovin & JI