STIR certificates

IETF 94 – Yokohama

STIR WG

No New Version

- But not because there has not been much talk about it…
- Clear that we need to reaffirm some first principles

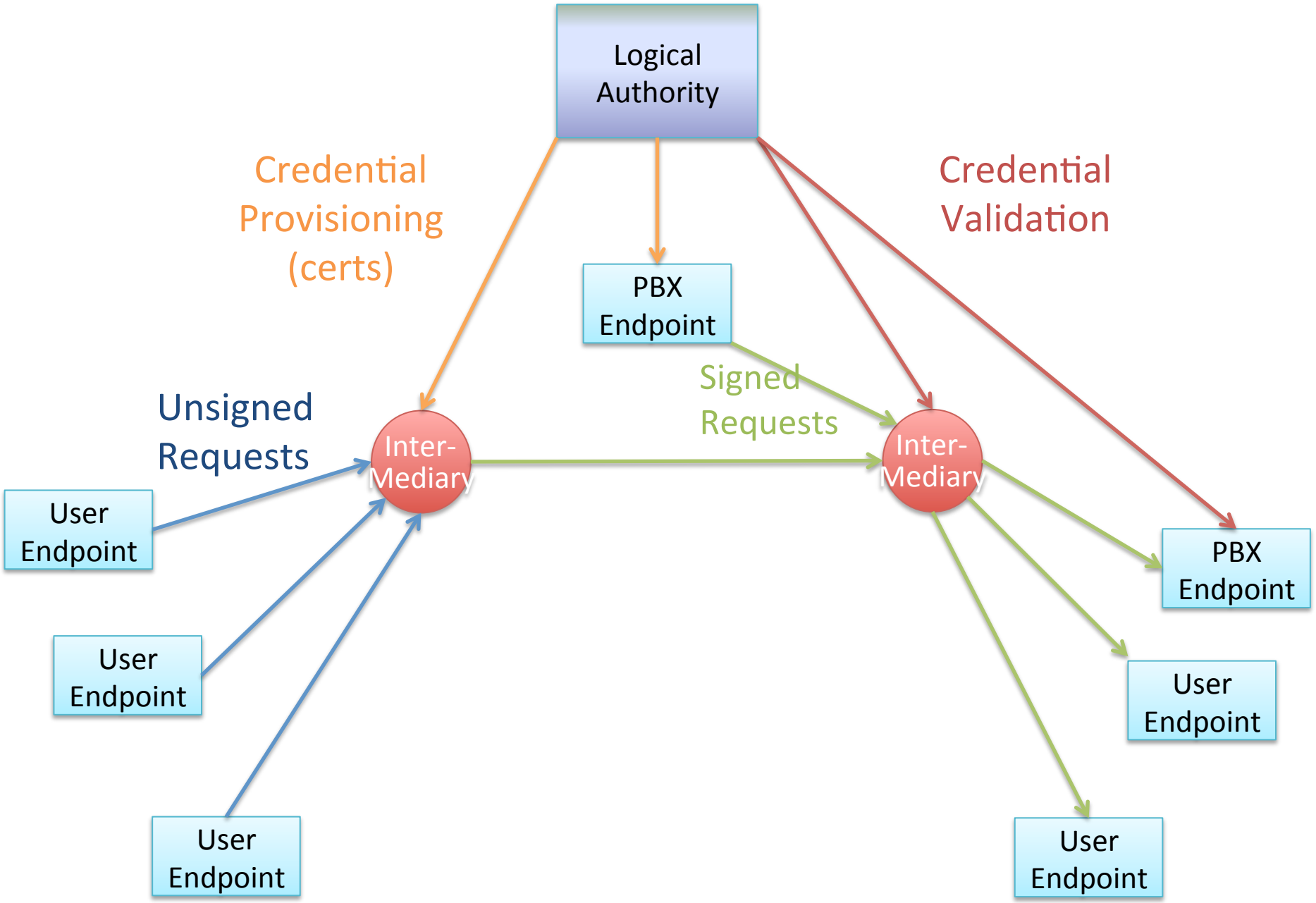
What is the STIR certs draft?

- Specifies a way to associate authority for TNs in a certificate.
- Why? Our threat model (RFC7375) reads:

  The design of the credential system envisioned as a solution to these threats must, for example, limit the scope of the credentials issued to carriers or national authorities to those numbers that fall under their purview.

- So, we made this a WG item, etc.

In-band STIR Logical Architecture



Is There Another Way?

- Sure!
- We aren't going to design or select a CA
- We aren't going to tell a verifier who it should and shouldn't trust in an authorization decision
- We are on the hook to document a way to find out if a number is assigned to a carrier
  - We aren't forcing anyone to use it, though

Ultimate Requirement Questions

- Should these calls be publicly verifiable on the Internet?
- Should you be able to trust a call signed by an entity with whom you have had no previous association?
- Should you need to know the entity signing a call in order to trust it?
- Should non-traditional entities (not LECs, in the US) be able to sign for numbers?

Transitive Trust vs. Intransitive Trust

- If carrier A trusts carrier B
  - And A and B each have certs identifying themselves in the subject
- Can A sign (rfc4474bis) a call with that cert, and can B trust that call
  - Yes, of course – deployable today, with web certs!
- But are the semantics any different from sending the call over a TLS connection pinned up with A's cert?
  - Or any other transitive trust closed network today?
  - All B really knows is that A is willing to vouch for the call
  - Signing here has limited value compared to baseline PAI
    - Could persist through transit networks, say

Public or Confidential Credentials?

- How much information are we willing to make public?
  - Should credentials advertise a subject (e.g., "AT&T")
    - Okay when a call is received to know the originating carrier?
      - Receiving user vs. receiving carrier may be different
    - More seriously, can an attacker mine a public database to reveal who owns *all* numbers?
  - Will we introduce VIPR-like privacy leaks?
- Can we restrict access to the credentials?
  - Identity "info", say, could carry short lived, un-guessable URLs
  - How important is endpoint verification?
    - Does trust become transitive if endpoints rely on intermediary verifiers?

Certs for OCN

- Or SPIDs, or some other surrogate for identifying a carrier
  - Might alleviate “leakage” concerns
- Verifiers could query a back-end database that tells you whether or not a number falls under that OCN
  - Really, very much what the OCSP check in stir-certs is about
- Assumes a new CA for those OCNs or whatever, though
  - And if you’re doing that, why not stir-certs?

Other Transitive Approaches

- Imagine defining a “spec” (rfc4474bis) that means “third-party signature”
  - Like, carrier A got this from carrier C or enterprise D, and carrier A is vouching for them
  - Maybe carrier C or enterprise D also has an Identity sig in the message

So what now?

- If someone wants to propose new work on certs for OCNs, or with carriers as subjects, feel free
  - Doesn't have to be done here, even
- This is a time for trying out approaches
  - No one has a monopoly on answers here
- We should continue with the stir-certs work