Update on RPKI Validator Testing

SIDR WG – IETF 85, Atlanta, GA

Andrew Chi <achi@bbn.com>
BBN Technologies

Outline

- RPKI Validator Testing at IETF 85
- BBN Recent Runtime Statistics
- BBN Validator Test Harness

IETF 85 Validator Test Setup

- Validators
  - **rcynic** - http://subvert-rpki.hactrn.net/trunk/rcynic/
  - **BBN RPSTIR** - http://sourceforge.net/projects/rpstir/
  - **RIPE NCC Validator** - http://www.ripe.net/lir-services/resource-management/certification/tools-and-resources
- Trust anchors (TAs)
  - Production TAs from **all five Regional Internet Registries**
  - Pilot/Experimental TAs
- Repository snapshot taken on Monday, 5 Nov 2012
  - ~10,000 objects: 3k certs, 3k manifests, 3k CRLs, 1k ROAs
  - Test was run on the same offline snapshot to avoid time skew.

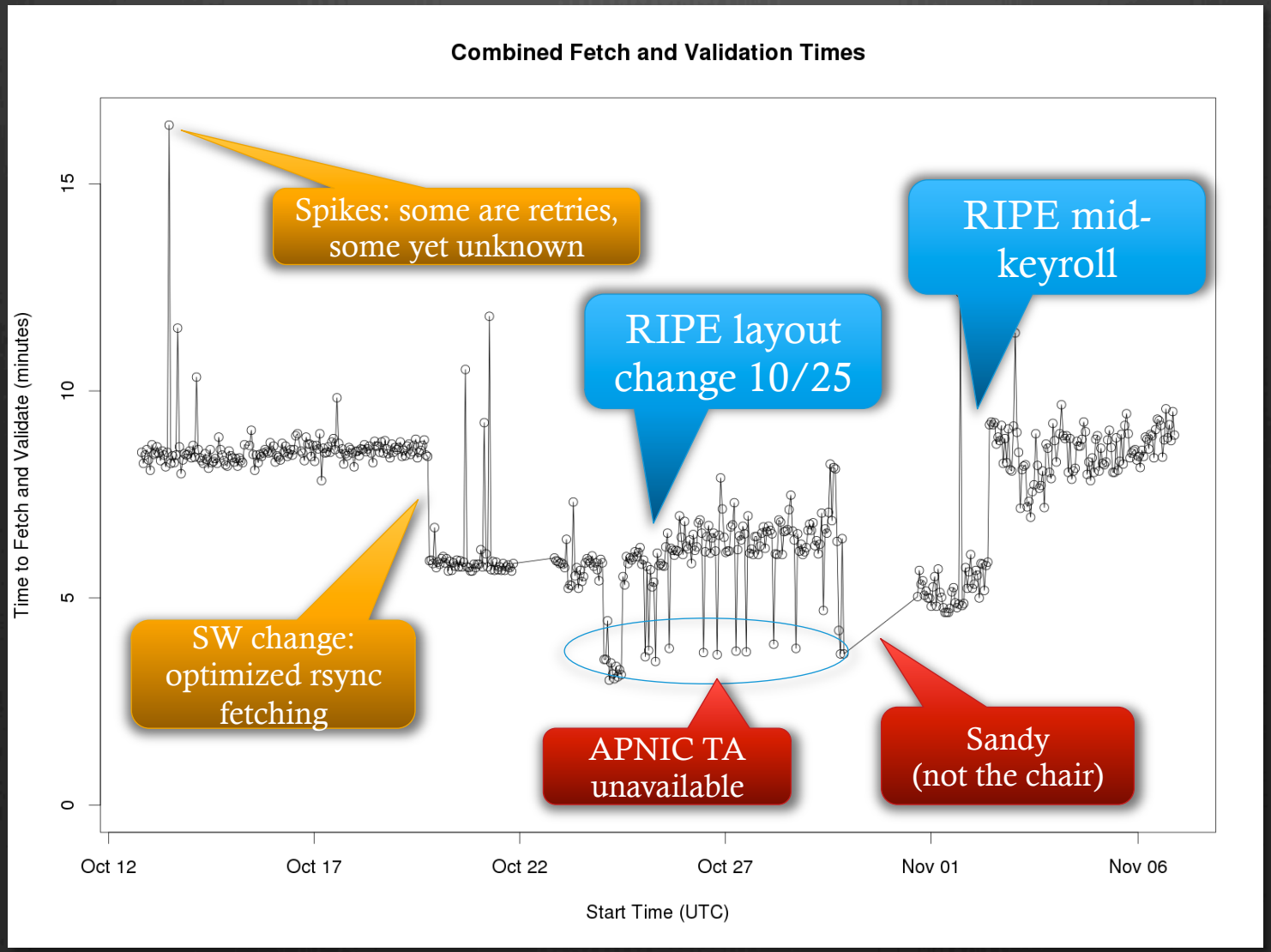
Validator Test Results

- Nearly all 10,000+ objects were validated by all 3 implementations. Production repositories are fine, modulo known minor nits.
- RPSTIR and rcynic results were nearly identical, RIPE NCC differed only slightly more. Small handful of discrepancies between results, mostly in pilot repos (~10)
  - Differing strictness about manifest/CRL staleness
  - Differing strictness about MFT EE SIA pointer, filename ext.
  - Ghostbusters support
  - A couple of bugs (1 RIPE, 1 BBN)
- SUCCESS: The production Resource PKI is nearly 100% compliant with the SIDR RFCs. We have multiple interoperating implementations: 5 producers x 3 consumers.

BBN Validation Run Time Stats

- BBN RPSTIR periodically sweeps all 5 RIRs. As of IETF 85, this is about 10,000 objects.
- Caching is disabled – therefore, worst case scenario with no memory of previous fetches.
- Retry on rsync error, with multiplicative backoff. No retry on validation errors.
- 24 parallel rsync threads
- Note: RPSTIR is designed to pipeline rsync fetching with certificate validation in order to reduce overall run time. Current release: rpstir-0.5

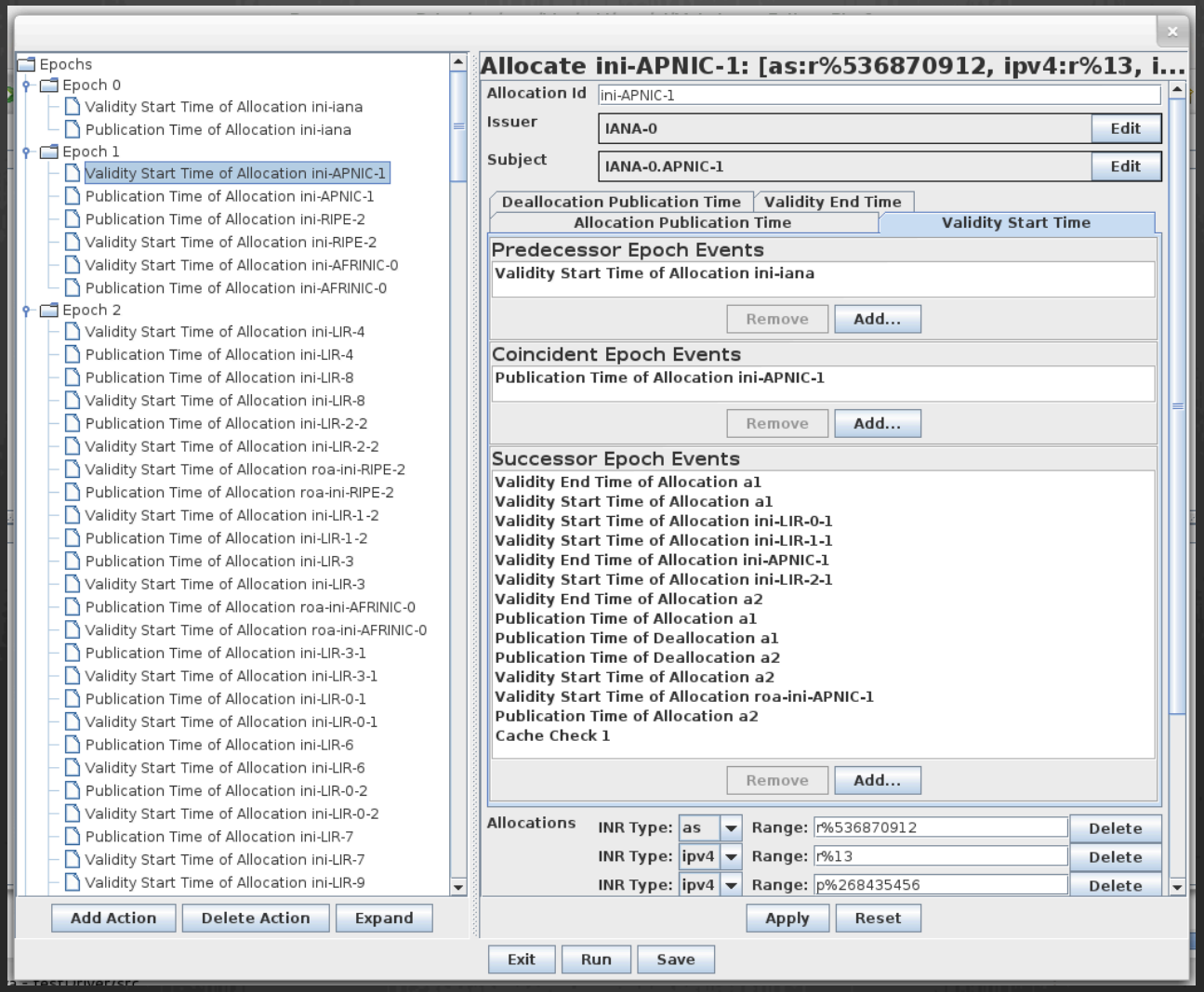
BBN Validation Run Time Stats



BBN Validator Test Harness

- Previously, BBN produced over 200 single-object conformance torture cases for strictly compliant validators (and therefore, repositories).
  - TA: rsync://rpki.bbn.com/conformance/root.cer
- To further harden validators for production use, the next step is to create a test harness for time-varying, multi-object scenarios.
- The test harness (work-in-progress) simulates the evolution of a repository through a series of "epochs" in time, allowing the simulation of scenarios such as:
  - Fetching during various stages of key rollover
  - Fetching during a publication point update

RPKI Epoch Builder (alpha)



Example Test Harness Scenarios

- Nominal Scenarios
  - Hierarchical vs shallow repositories
  - Certificate expiration, revocation, refresh
  - Key rollover
- Error Scenarios
  - Invalid signatures and RFC 3779 violations
  - Publication point not accessible
  - Publication point in mid-upload state
  - Evil-twin multiple parent, and others
- Error Recovery Scenarios
  - Publication point in mid-upload state for first fetch
  - Expired parent is replaced by non-expired parent

Questions?