10-13 Apr 2011 • San Juan, Puerto Rico

ARIN XXVII

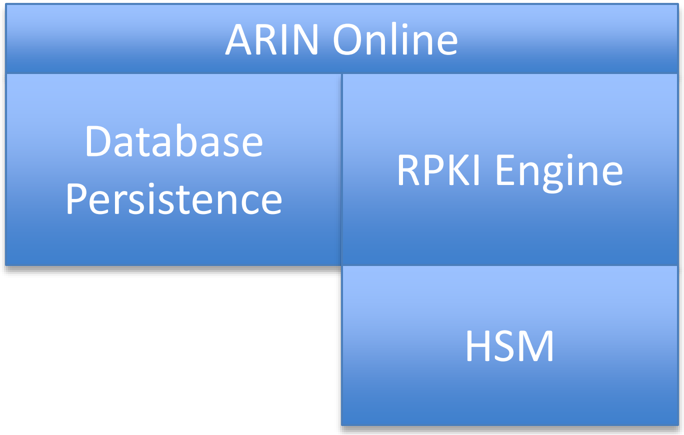
RPKI Engineering Update

Mark Kosters

Pilot

- Available since June, 2009
  - http://rpki-pilot.arin.net
  - **ARIN branded version of RIPE NCC software**
- 45 organizations participating
- #2 (behind RIPE) on prefixes/roas

General Architecture

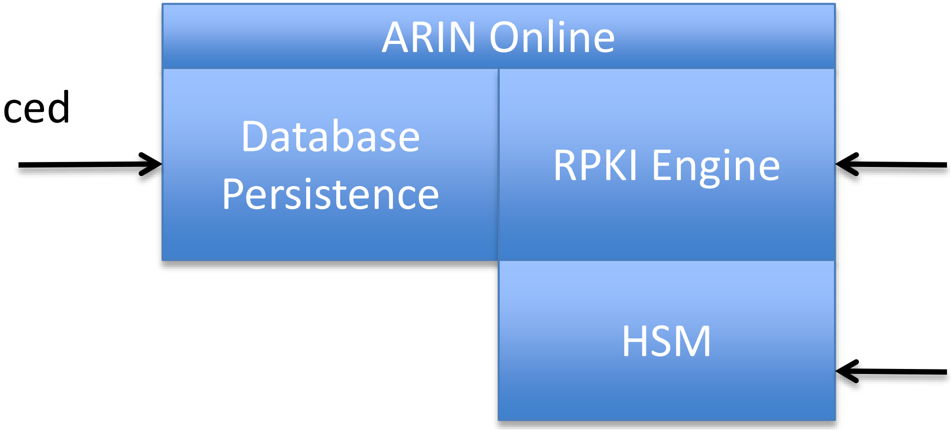


Tight coupling between resource certificate / ROA entities and registration dataset at the database layer. Once certs/ROAs are created, they must be maintained if the registered dependents are changed.

Development before ARIN XXVI

With a few finishing touches, ready to go Jan 1, 2011 with Hosted Model, Delegated Model to follow end of Q1.

Highly influenced by RIPE NCC entities.



ARIN Online

Database Persistence

RPKI Engine

HSM

RIPE NCC RPKI Engine with a few tweaks.

Sun SCA 6000

Everything is Java, JBoss, Hibernate.

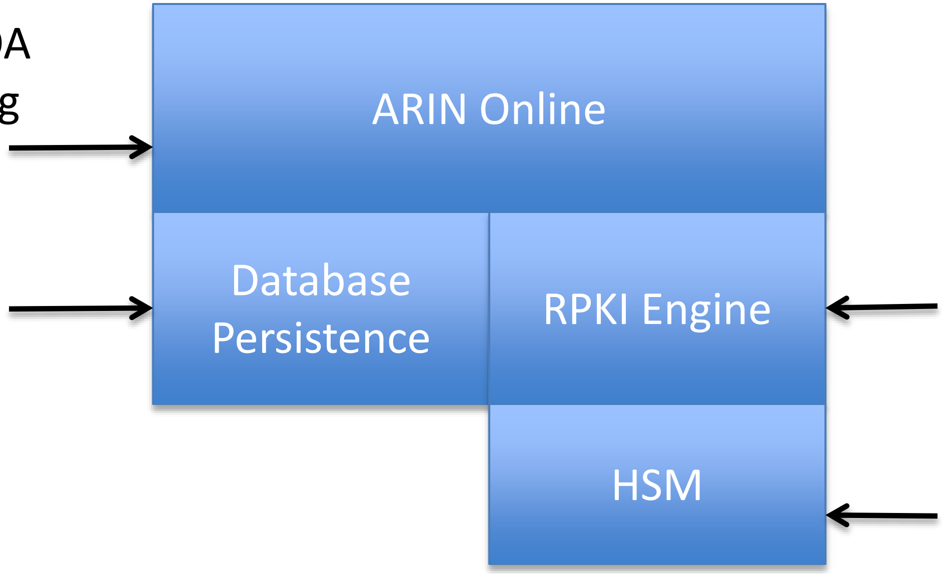
From ARIN XXVI

- RPKI Services
  - ARIN to sign (assert) directly assigned/allocated resources
  - Other related services such as storing signatures/assertions for downstreams under review
  - Board of Trustees, along with ARIN General Counsel, are evaluating risks associated with these services
  - ARIN is seeking input from community regarding the these services

As a Result…

- Completely new requirements for non-repudiation in ROA generation for hosted CAs
- Completely new requirements to thwart “Evil Mark” (rogue employee)
- Further intense review of liabilities by legal team and Board of Trustees

Changes Underway



ARIN Online

Database Persistence

RPKI Engine

HSM

In-browser ROA request signing via AJAX.

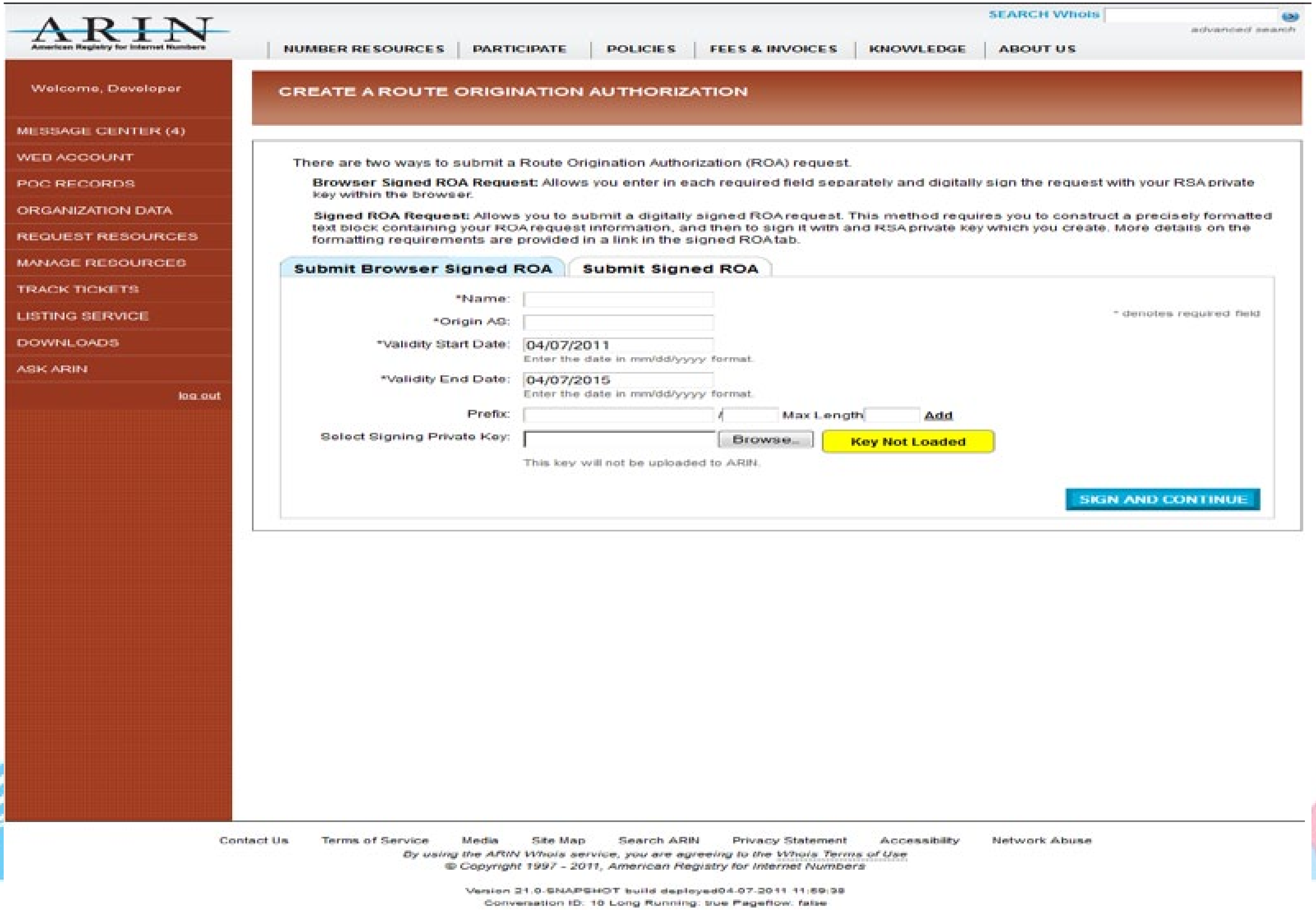
Minor changes.

Message driven engine which delegates to the HSM.

Custom programming on IBM 4764's to enable all DER encoding and crypto.

HSM coding is in C as extensions to IBM CCA. Libtasn1 used for DER coding.

Example – Creating a ROA



CREATE A ROUTE ORIGINATION AUTHORIZATION

There are two ways to submit a Route Origination Authorization (ROA) request.

Browser Signed ROA Request: Allows you enter in each required field separately and digitally sign the request with your RSA private key within the browser.

Signed ROA Request: Allows you to submit a digitally signed ROA request. This method requires you to construct a precisely formatted text block containing your ROA request information, and then to sign it with and RSA private key which you create. More details on the formatting requirements are provided in a link in the signed ROA tab.

* denotes required field

*Name:

*Origin AS:

*Validity Start Date: 04/07/2011
Enter the date in mm/dd/yyyy format.

*Validity End Date: 04/07/2015
Enter the date in mm/dd/yyyy format.

Prefix: / Max Length Add

Select Signing Private Key: Browse... Key Not Loaded
This key will not be uploaded to ARIN.

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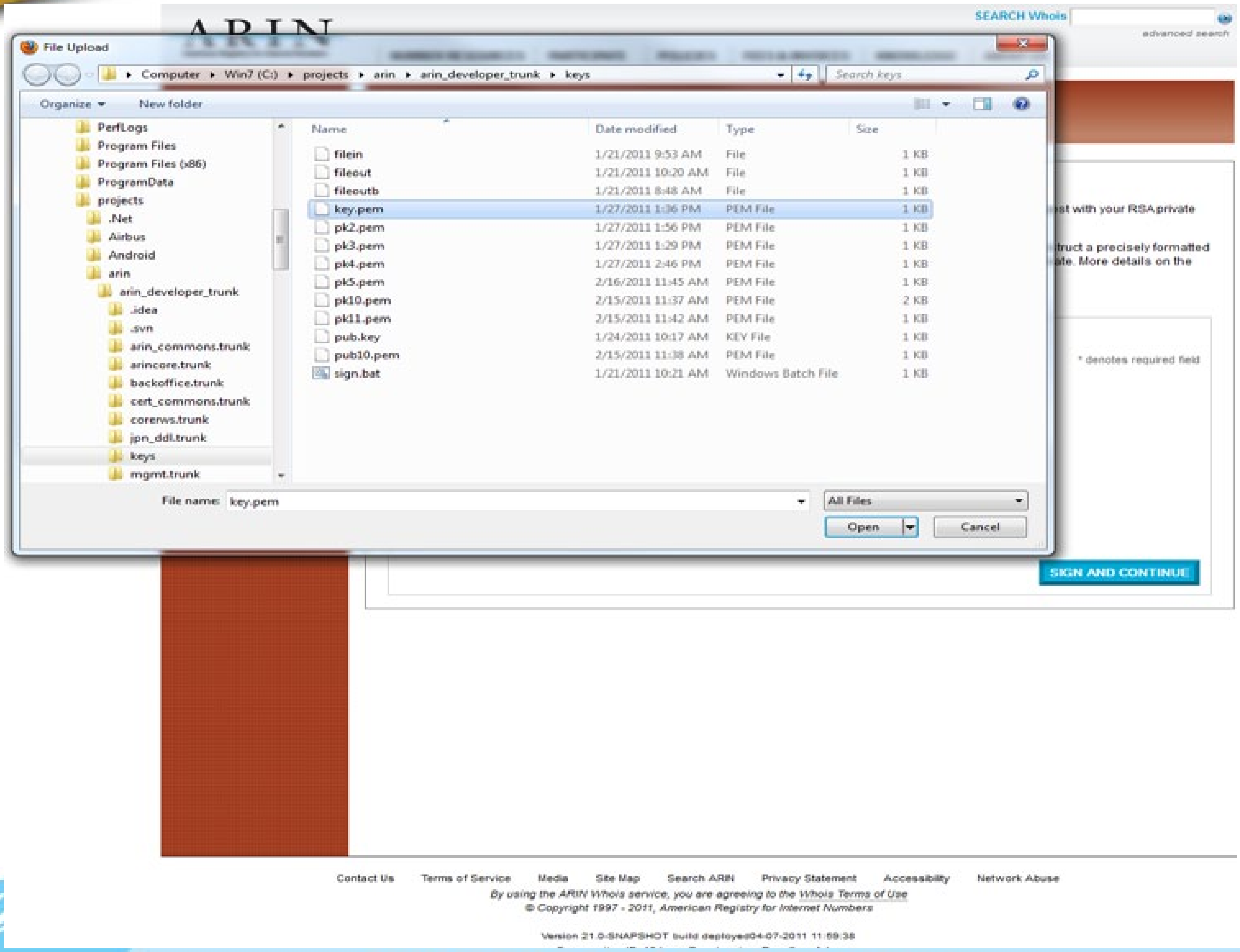
Version 21.0-SNAPSHOT build deployed04-07-2011 11:59:39
Conversation ID: 10 Long Running: true Pageflow: false



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fileout	1/21/2011 10:20 AM	File	1 KB
fileoutb	1/21/2011 8:48 AM	File	1 KB
key.pem	1/27/2011 1:36 PM	PEM File	1 KB
pk2.pem	1/27/2011 1:56 PM	PEM File	1 KB
pk3.pem	1/27/2011 1:29 PM	PEM File	1 KB
pk4.pem	1/27/2011 2:46 PM	PEM File	1 KB
pk5.pem	2/16/2011 11:45 AM	PEM File	1 KB
pk10.pem	2/15/2011 11:37 AM	PEM File	2 KB
pk11.pem	2/15/2011 11:42 AM	PEM File	1 KB
pub.key	1/24/2011 10:17 AM	KEY File	1 KB
pub10.pem	2/15/2011 11:38 AM	PEM File	1 KB
sign.bat	1/21/2011 10:21 AM	Windows Batch File	1 KB

File name: key.pem

All Files

...st with your RSA private

...truct a precisely formatted ...ate. More details on the

* denotes required field

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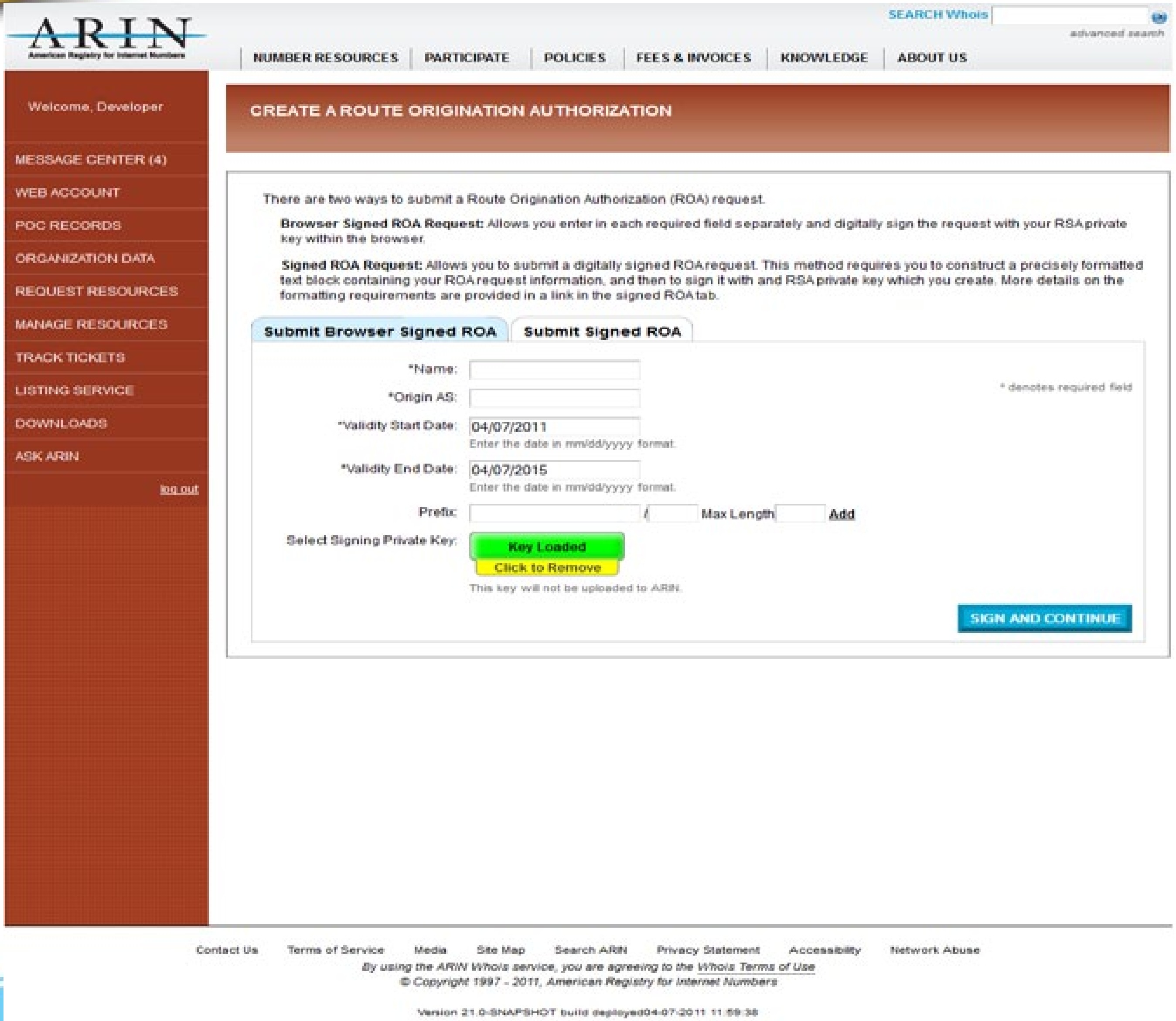
Version 21.0-SNAPSHOT build deployed04-07-2011 11:59:38



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*Name:

*Origin AS:

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Enter the date in mm/dd/yyyy format.

*Validity End Date: 04/07/2015
Enter the date in mm/dd/yyyy format.

Prefix: / Max Length

Select Signing Private Key:

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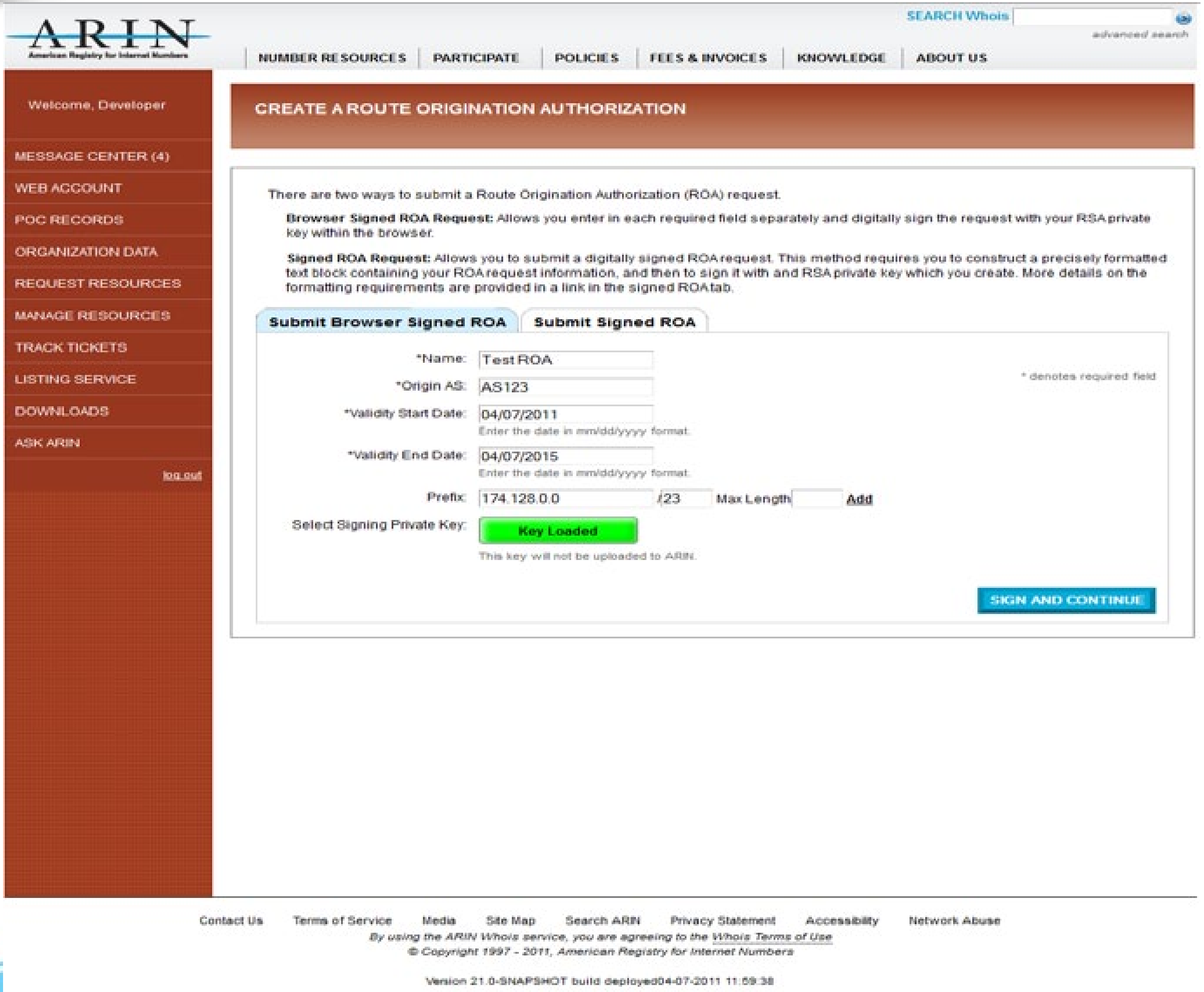

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* denotes required field

*Name:	Test ROA
*Origin AS:	AS123
*Validity Start Date:	04/07/2011 Enter the date in mm/dd/yyyy format.
*Validity End Date:	04/07/2015 Enter the date in mm/dd/yyyy format.
Prefix:	174.128.0.0 /23 Max Length Add
Select Signing Private Key:	Key Loaded This key will not be uploaded to ARIN.

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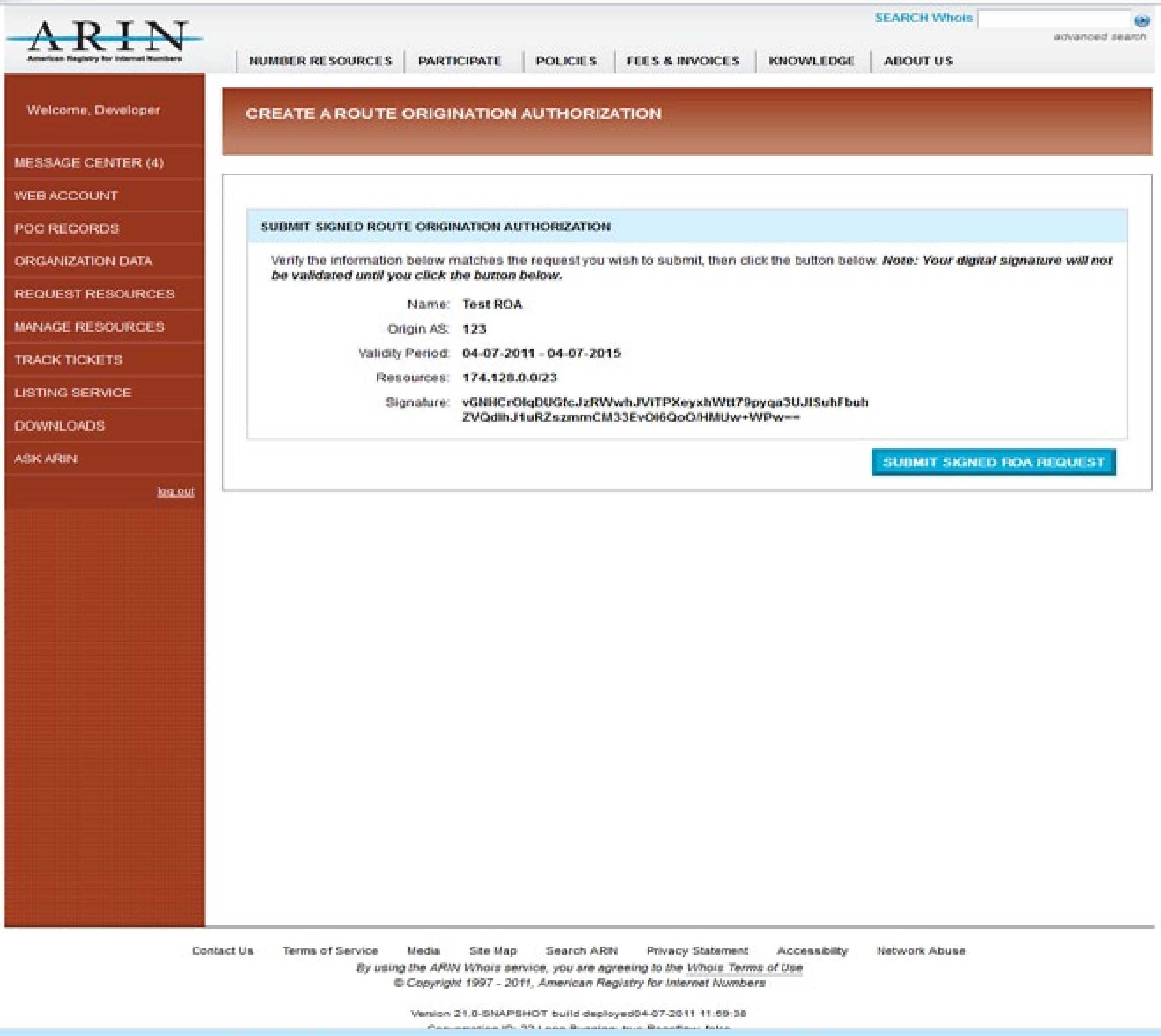

CREATE A ROUTE ORIGINATION AUTHORIZATION

SUBMIT SIGNED ROUTE ORIGINATION AUTHORIZATION

Verify the information below matches the request you wish to submit, then click the button below. ***Note: Your digital signature will not be validated until you click the button below.***

Name: **Test ROA**

Origin AS: **123**

Validity Period: **04-07-2011 - 04-07-2015**

Resources: **174.128.0.0/23**

Signature: **vGNHCrOlqDUGfcJzRWwhJViTPXeyxhWtt79pyqa3UJISuhFbuh
ZVQdlhJ1uRZszmmCM33EvOl6QoO/HMUw+WPw==**

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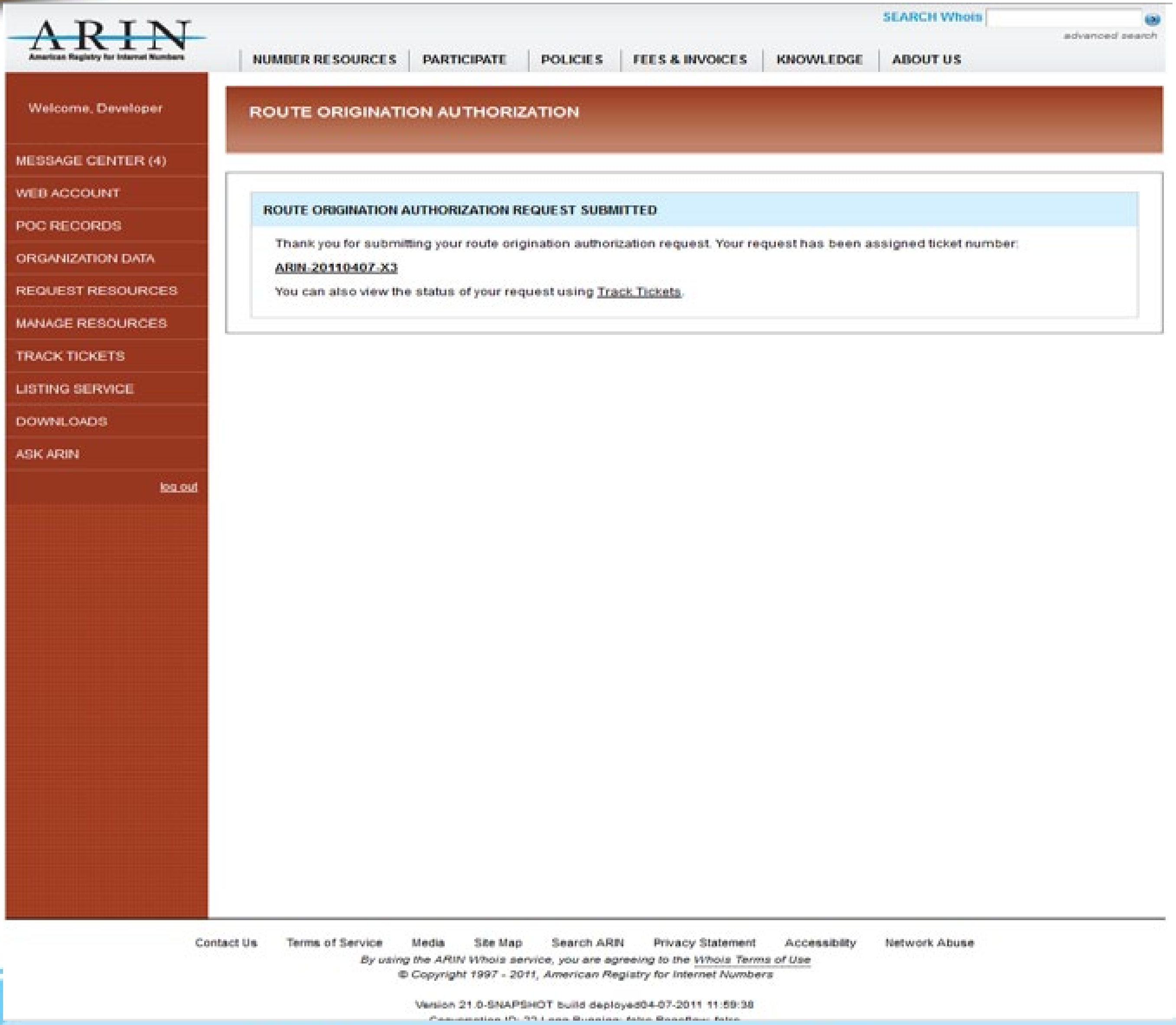

ROUTE ORIGINATION AUTHORIZATION

ROUTE ORIGINATION AUTHORIZATION REQUEST SUBMITTED

Thank you for submitting your route origination authorization request. Your request has been assigned ticket number:

ARIN-20110407-X3

You can also view the status of your request using Track Tickets.

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Conversation ID: 22 Long Running: false Pageflow: false

Updates within RPKI outside of ARIN

- The four other RIRs are in production with Hosted CA services
- Major routing vendor support being tested
- Announcement of public domain routing code support

ARIN Status

- Hosted CA anticipated in May at the earliest
- We intend to use RIPE NCC up/down code for delegated model
- Awaiting approval by our Board of Trustees for both models of deployment