APNIC 34 CONFERENCE

PHNOM PENH
CAMBODIA

21 - 31 August 2012

APNIC RPKI Report

George Michaelson

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Current Status

- In service since Jan 2009
- Two level service accessed via myAPNIC
  - APNIC certifies members holdings
  - Members can certify their allocations through hosted service interface

Current APNIC RPKI Service

- Generate CA Certificates covering allocated resources
- Manage resource pools and datasets
- Generate Routing Authority Attestations (ROA)

Current Activity

1. Trust Anchor management
2. ROA management
3. General Signer
4. Public Up-Down Protocol interface

1. Trust Anchor Management

- Split single APNIC TA to multi-component TA
  - Reflect IANA and ERX resource origin
  - Compatible with ongoing work on Global TA
- Disruption to existing deployed service will be minimal due to sparse ERX holdings in APNIC region
- TA transition in place by Q4

2. ROA Management

- User defined MaxLength parameter for ROA
  - Previously fixed-length in UI
  - No back-end changes

3. General Signer

- “Resource Tagged Attestations”
  - Ability to sign files with RPKI digital signatures
  - Useful for Resource Transfers, Customer Provisioning, general attestations about addresses
  - CMS based objects
  - multiple key signing supported
  - Validity dates

General Signer Motivation

- RFC3779 encodes Internet Number Resources as critical extensions into public-key certificates
  - This is a (cryptographically) strong mechanism
- We now have a mechanism to make strong, testable attestations about Internet Number Resources.

Examples

“please can you add a static route for 192.0.200.0/24 to my service,

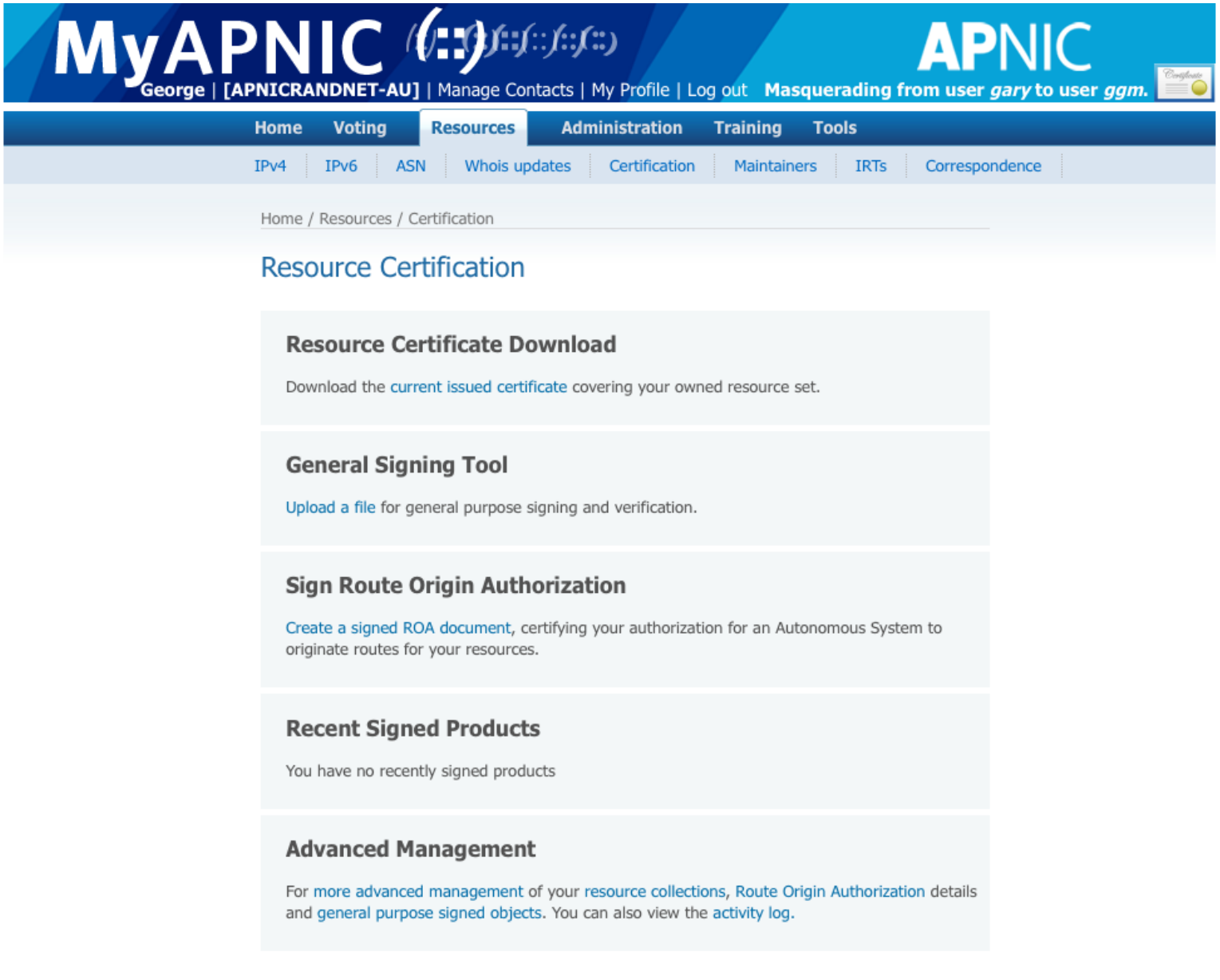
signed, owner of 192.0.200.0/24”

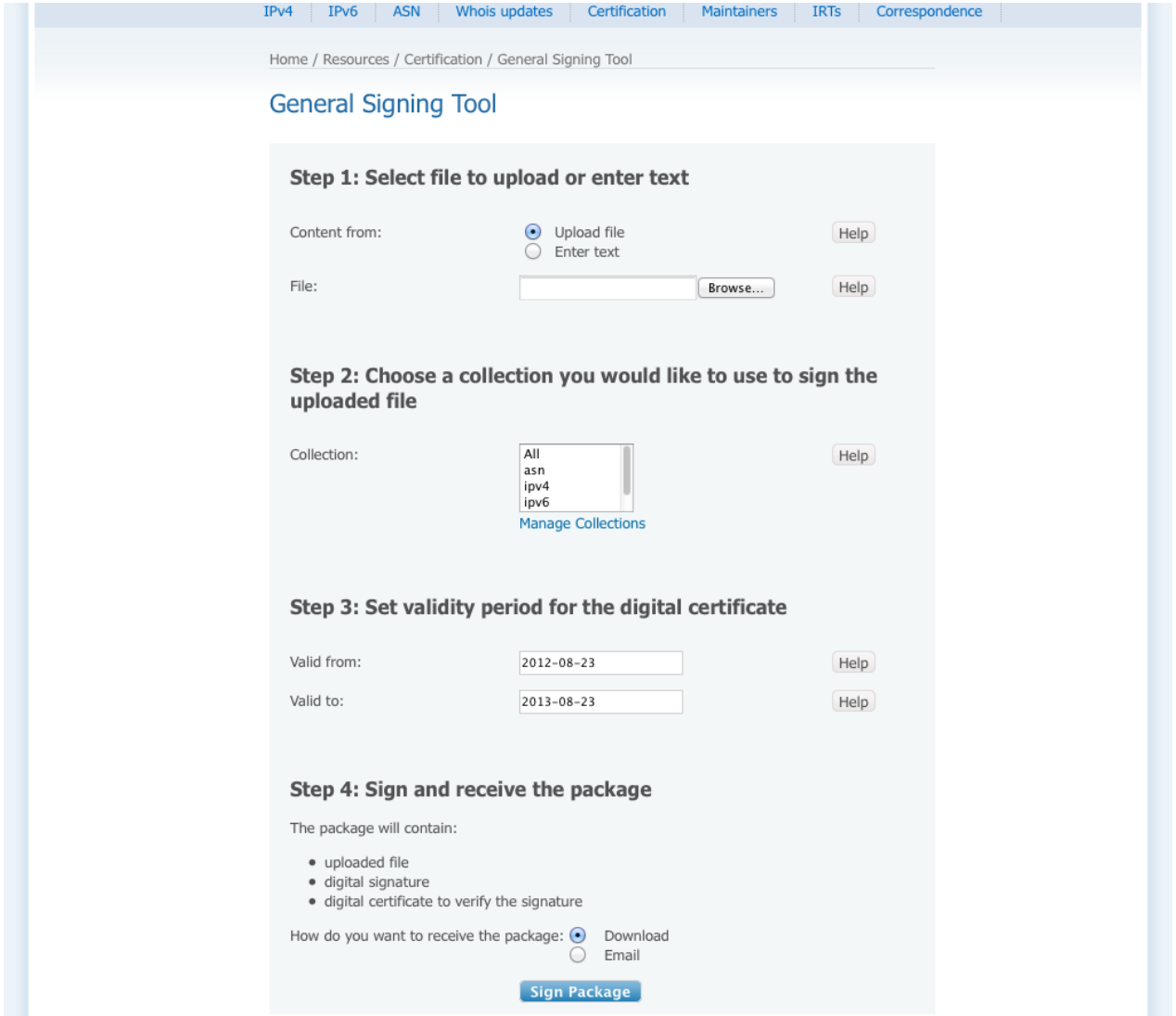
– ISP can now verify request comes from delegate for the prefix

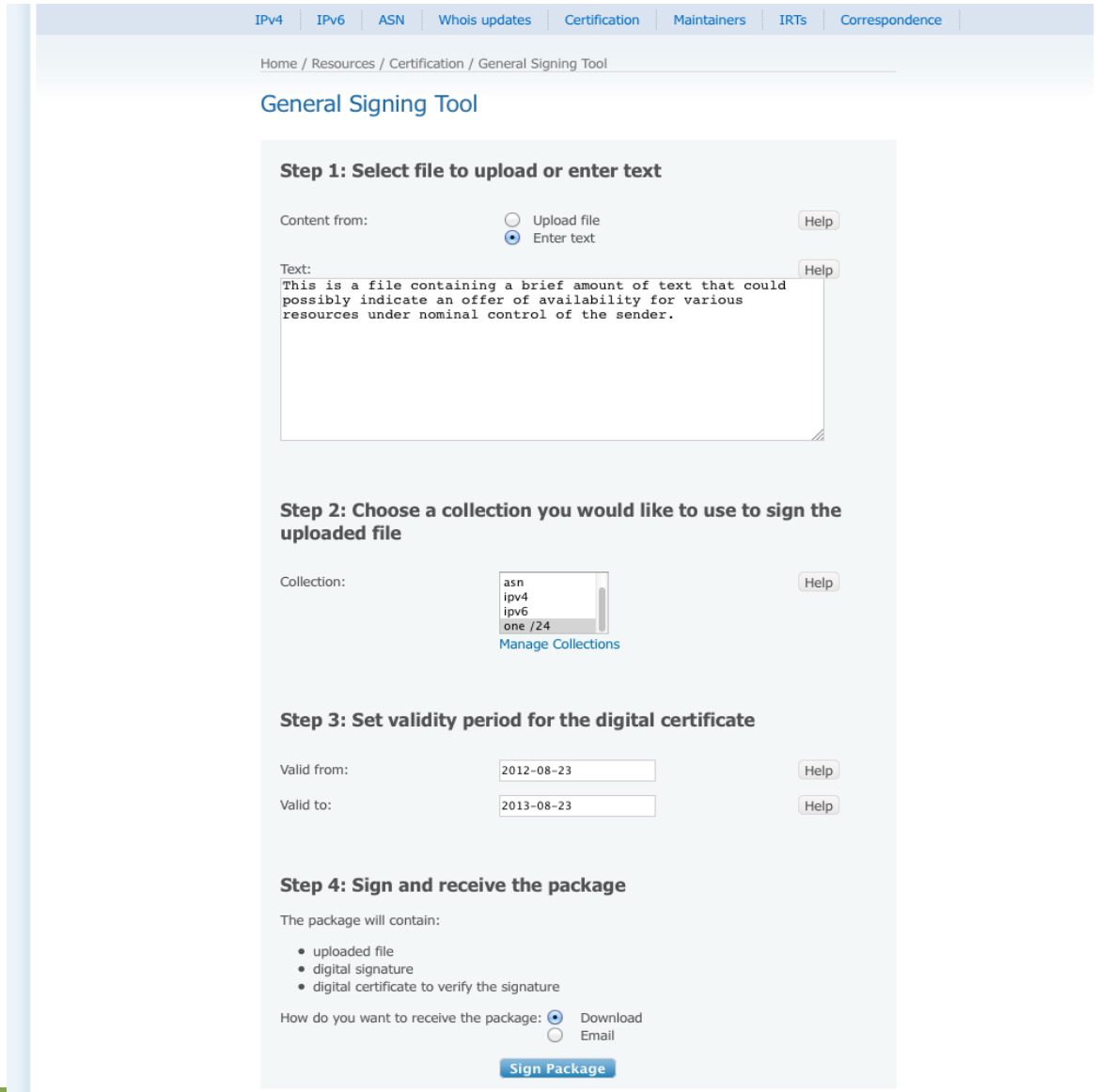
“Dear broker, as the current holder of 192.0.200.0/24 please list this block as available for transfer,

signed, *the soon-to-be ex-owner of 192.0.200.0/24*”

– Broker can now validate this listing request


MyAPNIC
APNIC
George | [APNICRANDNET-AU] | Manage Contacts | My Profile | Log out
Masquerading from user gary to user ggm.
Home
Voting
Resources
Administration
Training
Tools
IPv4
IPv6
ASN
Whois updates
Certification
Maintainers
IRTs
Correspondence
Home / Resources / Certification
Resource Certification
Resource Certificate Download
Download the current issued certificate covering your owned resource set.
General Signing Tool
Upload a file for general purpose signing and verification.
Sign Route Origin Authorization
Create a signed ROA document, certifying your authorization for an Autonomous System to originate routes for your resources.
Recent Signed Products
You have no recently signed products
Advanced Management
For more advanced management of your resource collections, Route Origin Authorization details and general purpose signed objects. You can also view the activity log.


IPv4
IPv6
ASN
Whois updates
Certification
Maintainers
IRTs
Correspondence
Home / Resources / Certification / General Signing Tool
General Signing Tool
Step 1: Select file to upload or enter text
Content from:
Upload file
Enter text
Help
File:
Browse...
Help
Step 2: Choose a collection you would like to use to sign the uploaded file
Collection:
All
asn
ipv4
ipv6
Help
Manage Collections
Step 3: Set validity period for the digital certificate
Valid from:
2012-08-23
Help
Valid to:
2013-08-23
Help
Step 4: Sign and receive the package
The package will contain:
uploaded file
digital signature
digital certificate to verify the signature
How do you want to receive the package:
Download
Email
Sign Package


IPv4
IPv6
ASN
Whois updates
Certification
Maintainers
IRTs
Correspondence
Home / Resources / Certification / General Signing Tool
General Signing Tool
Step 1: Select file to upload or enter text
Content from:
Upload file
Enter text
Help
Text:
Help
This is a file containing a brief amount of text that could possibly indicate an offer of availability for various resources under nominal control of the sender.
Step 2: Choose a collection you would like to use to sign the uploaded file
Collection:
asn
ipv4
ipv6
one /24
Help
Manage Collections
Step 3: Set validity period for the digital certificate
Valid from:
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Help
Valid to:
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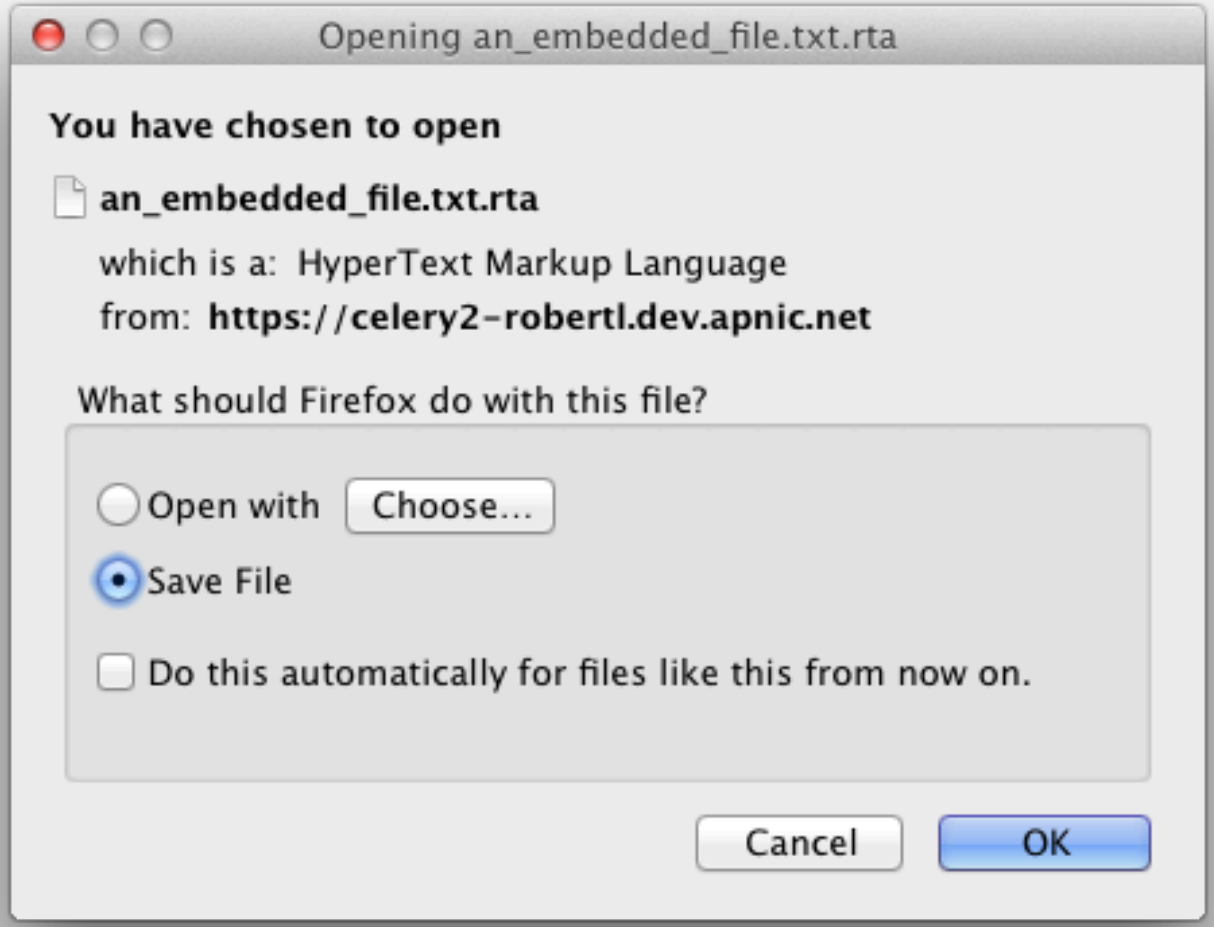
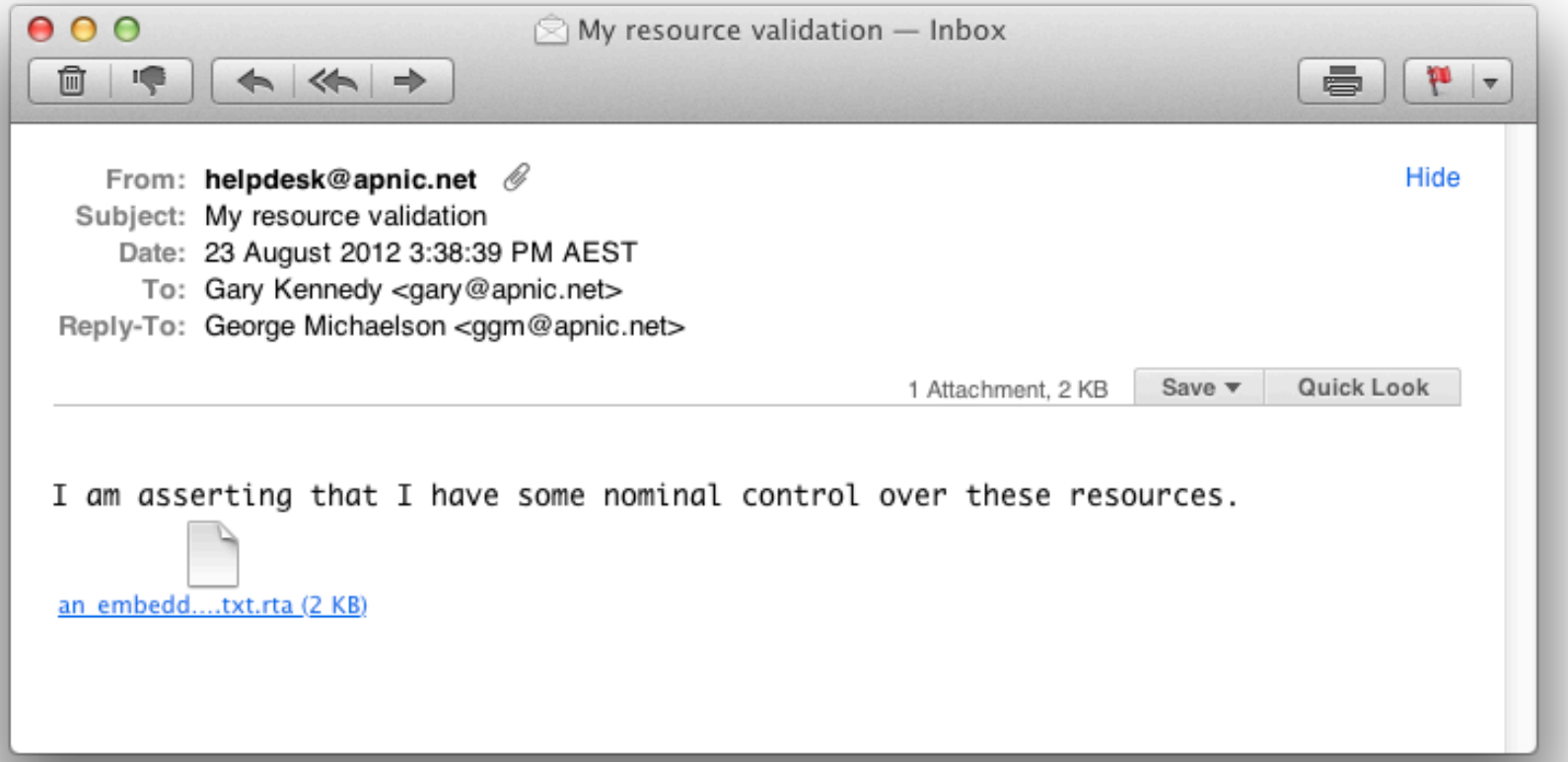
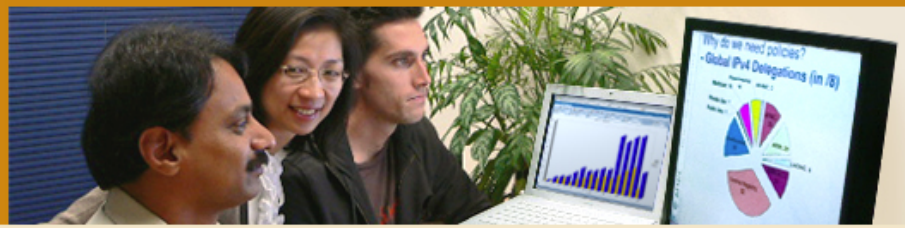
Step 4: Sign and receive the package
The package will contain:
uploaded file
digital signature
digital certificate to verify the signature
How do you want to receive the package:
Download
Email
Sign Package


Opening an_embedded_file.txt.rta
You have chosen to open
an_embedded_file.txt.rta
which is a: HyperText Markup Language
from: https://celery2-robertl.dev.apnic.net
What should Firefox do with this file?
Open with
Choose...
Save File
Do this automatically for files like this from now on.
Cancel
OK


My resource validation — Inbox
From: helpdesk@apnic.net
Hide
Subject: My resource validation
Date: 23 August 2012 3:38:39 PM AEST
To: Gary Kennedy <gary@apnic.net>
Reply-To: George Michaelson <ggm@apnic.net>
1 Attachment, 2 KB
Save
Quick Look
I am asserting that I have some nominal control over these resources.
an_embedd....txt.rta (2 KB)

Services



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> Routing Registry
v Resource certification
– RPK Infrastructure
– Certification Authorities
– Signature verification tool
– What's new
> Training & education
> Policy development
> Helpdesk

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Manage Internet resources
Helpdesk

Signature verification tool

Upload the signed package

File: Browse...

Upload & Verify

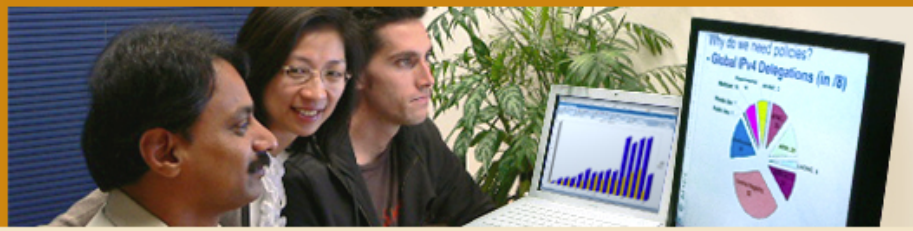
Related links

Certificates for MyAPNIC

Features & benefits

- Routing information corresponds to properly delegated address resources.
- Resource Certification gives resource holders proof that they hold certain resources.
- Resources holders can attest to those resources when distributing them.
- Allows anyone to make assertions about their right to use an IP address and allows anyone else to validate such a claim in a secure and reliable fashion.
- Resource users can 'sign' information with a digital signature which essentially 'freezes' that information. Therefore, any effort to alter that information results in the signature being invalidated.
- Only resource holders with a properly delegated 'right of use' can generate a signature.
- Routing advertisements are made with the explicit agreement of the current 'right of use' holder of the

Services



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- Only resource holders with a

Your IP:
203.119.42.228

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Signature verification tool

Verification Failed

Verification of your signature package failed with the response:

- Not a valid RTA package

Clear & Start Again

Related links

- Certificates for MyAPNIC

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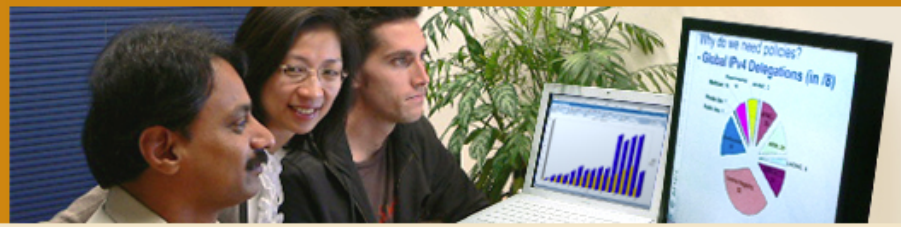

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File: achments/bad_resources.rta Browse...

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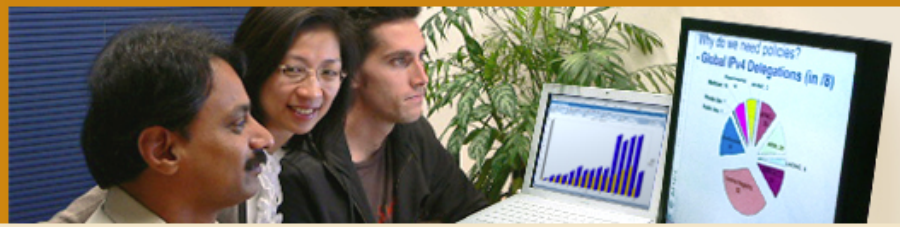

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Verification Failed

Verification of your signature package failed with the response:

- Signing certificates don't contain resources 7345, 14.64.21.0/24

Clear & Start Again

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Upload the signed package

File: ›/Attachments/detached.rta Browse...

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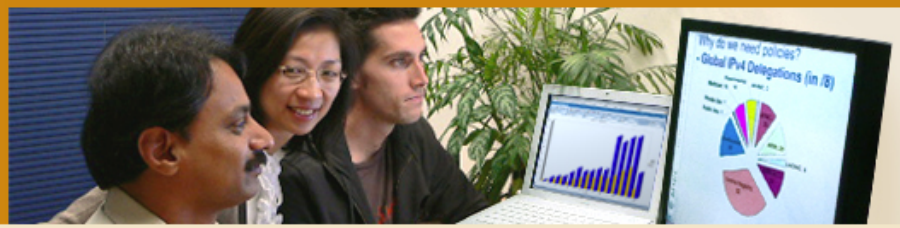

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Signature verification tool

Verification Successful

The signature in the package has been successfully verified with the certificate having the following resource coverage:

- 70.21.150.0/24
- AS30330

The signature package does not contain any content itself, but rather the hash of another file.

Content hash:
cda1211a928bf2eebed3de1a24d32689b7c95988f967f0f96b7808e6169a3057

Clear & Start Again

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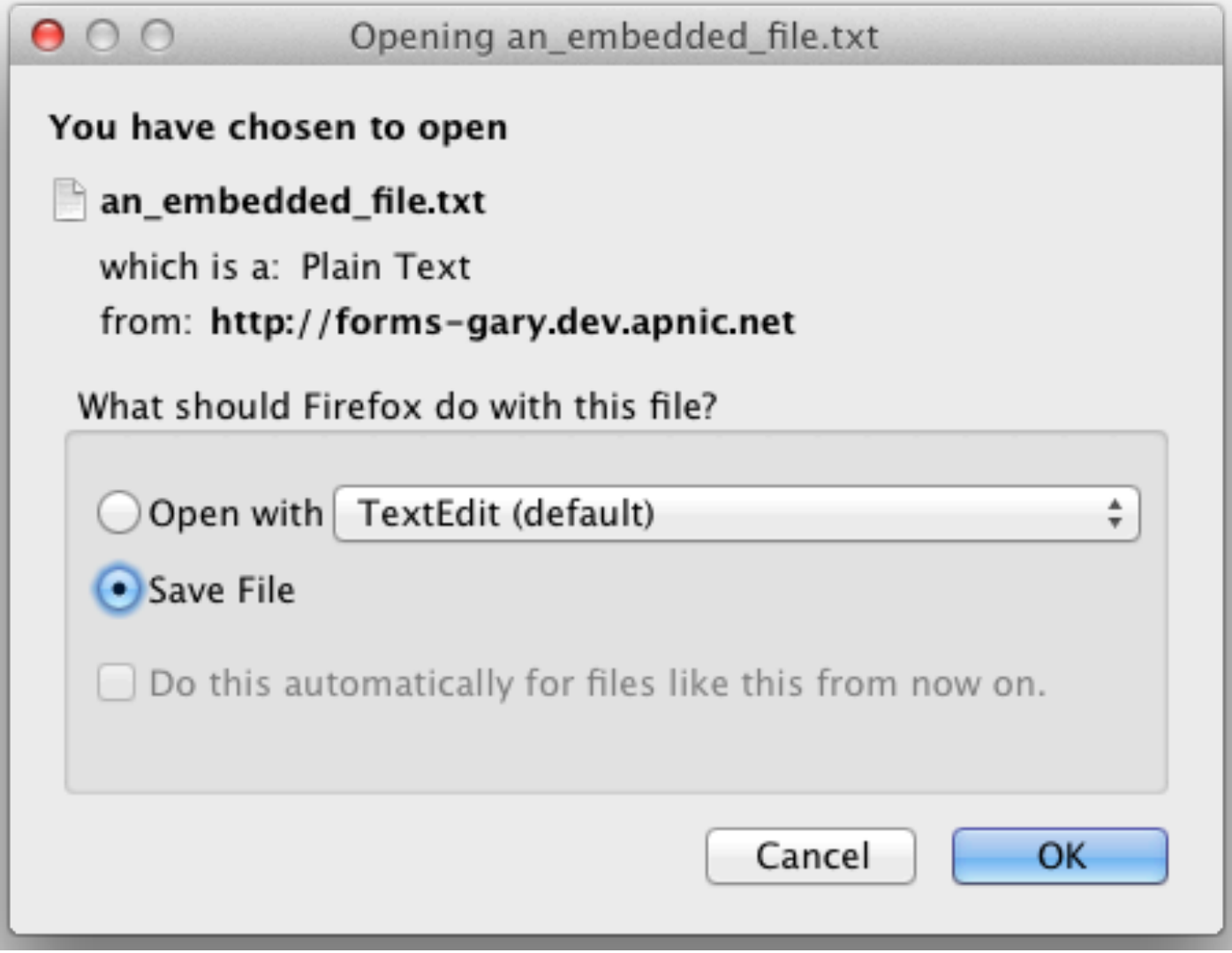
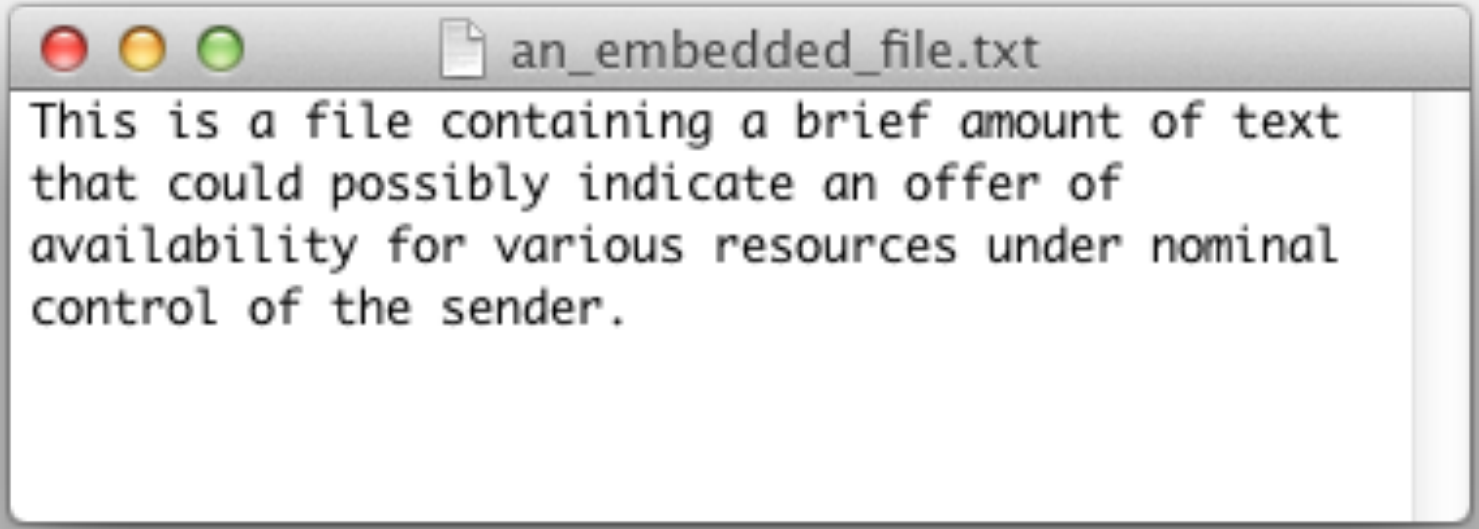

Opening an_embedded_file.txt
You have chosen to open
an_embedded_file.txt
which is a: Plain Text
from: http://forms-gary.dev.apnic.net
What should Firefox do with this file?
Open with
TextEdit (default)
Save File
Do this automatically for files like this from now on.
Cancel
OK


an_embedded_file.txt
This is a file containing a brief amount of text that could possibly indicate an offer of availability for various resources under nominal control of the sender.

4. Public Up-Down Protocol interface

- Complements existing myAPNIC hosted services
- Allows for NIR and LIR sub-delegated RPKI services
- Currently designing Up-Down enrollment procedures and credential exchange
- End Q4 deliverable

Interfacing to NIR Resource CA

- RPKI reflects resource allocation hierarchy
  - Support for NIR Resource CA therefore follows allocation hierarchy
- APNIC cannot sign what it doesn't know
  - APNIC RPKI CA signs the state of registry
  - APNIC supplies RPKI services over Up-Down Protocol
- Certification Practice requires APNIC issue RPKI certificates to NIR
  - NIR operates RPKI services reflecting NIR registry state

NIR Operational Model

- NIR operates an RPKI engine instance
- Interface with APNIC via public Up-Down port
- NIR issued RPKI certificates align to NIR resource registry state