Resource Certificate Profile

Background:

- This certificate is intended to express a “right-of-use relationship between the subject and an IP number resource set, as certified by the certificate’s issuer

- The certificate structure is intended to follow the allocation path – each party certifies their own allocation actions, so that the Issuer’s attestation regarding “right-of-use” mirrors the Issuer’s allocation actions of the number resource to a Subject

- The base profile is RFC3280 PKI Certificate Profile and RFC3779 IP Address extensions

- The proposed profile for Resource Certificates is in draft-ietf-sidr-res-certs

- This draft has been produced by an APNIC editing group, with input from a design team and this WG
• General constraints:
  – RFC3779 extensions are a CRITICAL extension and MUST be present, using a sorted canonical representation
  – An Issuer cannot certify more resources than the Issuer has in existing valid resource certificates
  – An Issuer cannot certify the same resource to 2 or more distinct Subjects
• **Certificate Fields:**

  **Version** = 3

  **Serial Number** = positive integer

  **Signature Algorithm** = SHA256 with RSA

  **Subject Public Key Info** = Minimum bit size of 1024 bits. Intended root certificates should use key size = 2048 bits

  **Basic Constraints** = CA ON for allocation certificates, CA = OFF for signing certificates

  **Subject Key Identifier** = 160 bit SHA-1 hash of the subject’s public key

  **Authority Key Identifier** = 160 bit SHA-1 hash of the issuer’s public key

  **CRLDP** = single CRL, with at least an RSYNC:: object URL

  **AIA** = *publication point of Issuer’s immediate superior certificate (in the form of a PURL)*, with at least an RSYNC:: object URI

  **SIA** = if a CA, publication point of all issued certificates, or if an EE cert, the URL of the object signed with this EE Cert, with at least an RSYNC:: directory URI
Certificate Revocation List Fields

Scope = all certificates issued by this CA
Version = 2
Authority Key Identifier = 160 bit SHA-1 hash of the issuer’s public key
CRL Number = monotonically increasing integer
Current Activity

• The AIA points to the Issuer’s immediate certificate
  – Define this as an object reference persistent URL (i.e. persistent across re-issuance, but not against issuer re-key)
Certificate Pointers

CA1
Issued Certificate

CA2
Issued Certificates

AIA (PURL Object)

SIA (Directory Object)

Issuer CA2's Certificate Store
Refinements to the Profile

• The AIA points to the Issuer’s immediate certificate
  – Define this as an object reference persistent URL (i.e. persistent across re-issuance, but not against issuer re-key)

• End Entity (no-CA) Certificates are used as one-off signing certificates
  – EE cert can be used for a single signing
  – Private key is destroyed after a single use
  – EE Cert SIA is a pointer to the object that has been signed with the corresponding private key
  – Signed object validity and resource attributes are controlled by the associated EE certificate(s)
End Entity Certificates

1. Generate Key Pair
2. Generate EE Cert of public key
3. Attach EE Cert to Document
4. Sign with Private Key
5. Destroy Private Key
6. Revoke Signature by revoking EE Cert
Refinements to the Profile

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• Add the “Security Considerations” section text!
Review Comments

• Examples of Use of Resource Certificates?

• Example case of a subordinate certificate have a longer validity period than the superior certificate?

• Is the key size “SHOULD” a minimum or an absolute size?

• For Signature Algorithm should SHA-384 and SHA-512 be allowed options? Or should this be documented in a CP?

• Why specify RSYNC access as a “MUST” URI form? What is the normative language here?
Next Steps

- Generate an -03 version post IETF 67
- Request WG chair for Last Call on this document