Certification More Tangible

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Drivers

- RIR's are implementing a solution to certify resources
  - APNIC and ARIN are implementing an RPKI engine
- Potential IPv4 marketplace: keeping it white
  - Need to be prepared when the stakes go up
  - An IPv4 black market could turn routing into chaos
- RIPE NCC has the task to uphold principles
  - Uniqueness
- Enhanced Registration Services
  - Increasing importance in relation with government, law enforcement...

Progress since RIPE 55 Meeting

- Focus on business value for RIPE members

- Insight by starting implementation

- The added value of Certification

- Business cases more tangible

- Develop internal business processes to support Certification

- Closer contact with Task force

- More active involvement in technical discussions

What is the value of a certificate?

Party

Resource

Signature

What is the value of a certificate?

What is the value of a certificate?

"Party holds a Resource…"

"…because RIPE NCC said so"

Party

Resource

Signature

What is the value of a certificate?

- *Do you believe that RIPE NCC is saying that?*
- *Do you trust what RIPE NCC is saying?*

"Party holds a Resource…"

"…because RIPE NCC said so"

Party

Resource

Signature

What is the value of a certificate?

"Party holds a Resource…"

Party

Resource

Signature

"…because RIPE NCC said so"

- *Do you believe that RIPE NCC is saying that?*

- *Do you trust what RIPE NCC is saying?*

- Certification only answers the first question
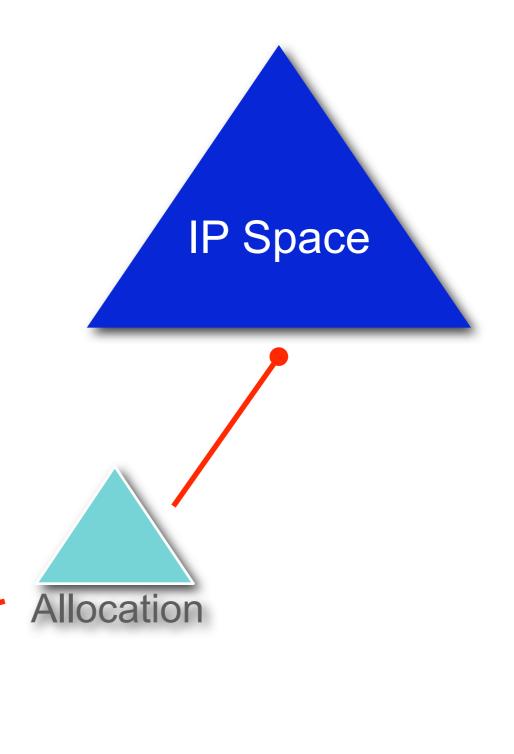
- Certificates are not trust anchors, the registry is!

It's all about Allocations

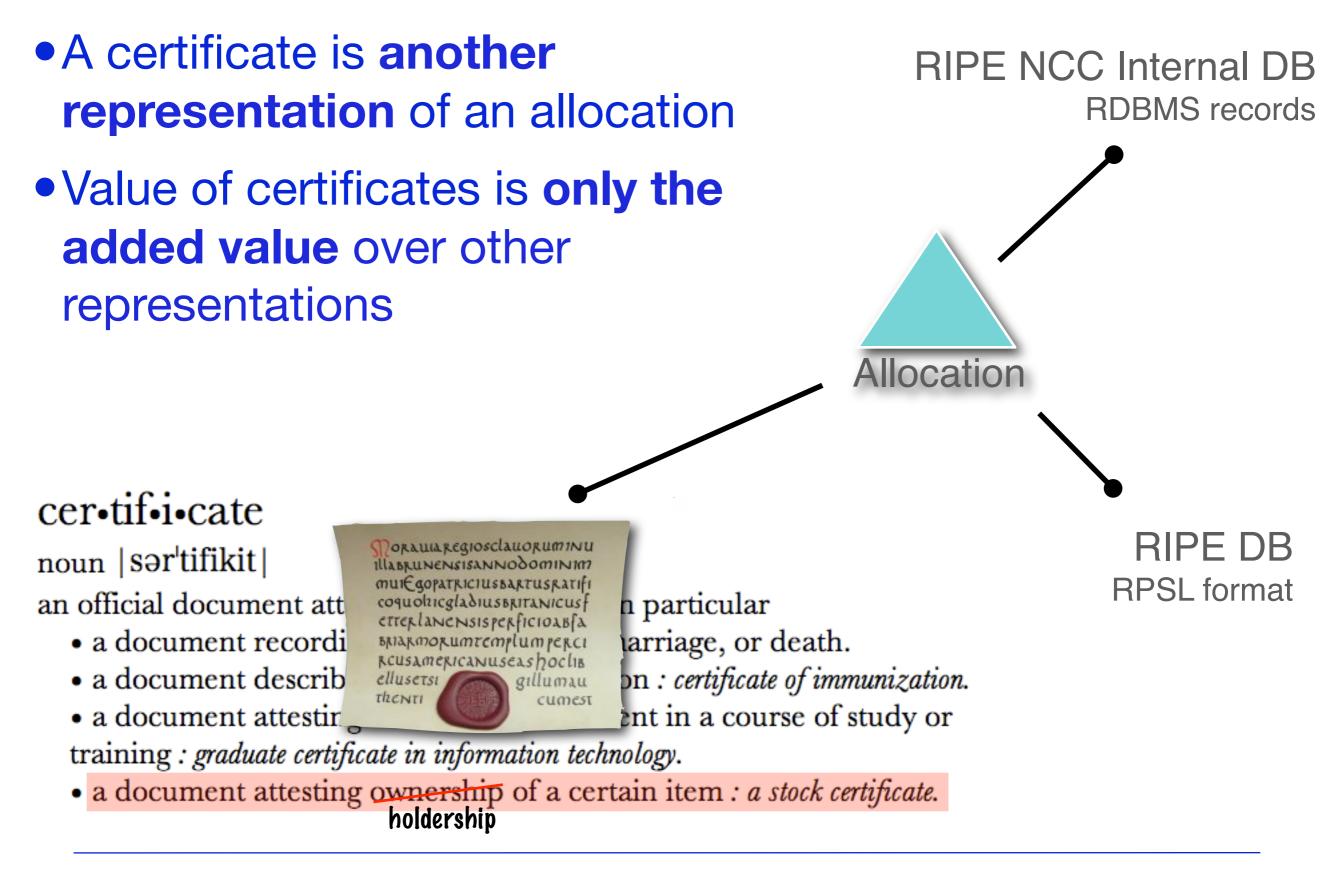- Allocations are RIPE NCC's core concept
- Connect a party to an IP Resource

IP Space

Allocation

...and other kinds of parties

Certificates vs. Allocations

- A certificate is **another representation** of an allocation

- Value of certificates is **only the added value** over other representations

RIPE NCC Internal DB
RDBMS records

Allocation

RIPE DB
RPSL format

cer•tif•i•cate

noun |sərˈtifikit|

an official document att___n particular

- a document recordi___arriage, or death.
- a document describ___on : *certificate of immunization.*
- a document attestin___nt in a course of study or training : *graduate certificate in information technology.*
- a document attesting ownership of a certain item : *a stock certificate.*

holdership

Added value

- Certificates can be the international exchange standard between RIR's

- Could help automated provisioning
  - easier to prove holdership than through "detective work"
  - certified information in parseable format

- Support resource transfers

- (Long term) Could help future secure routing
  - fills need for a PKI infrastructure and trusted third party

Certificates are not **a prerequisite for:**

- **Transfer of allocations**
  - Registry **can** do this without any form of electronic certification
  - Transfers have been done already

- **Proof of holdership**
  - Certificates are not the truth, they **only attest** the trust as held by the Registry
  - A certificate is only as valuable as the trust in the Registry
  - Holdership could be proven in other (non-electronic) ways

The wider picture

- Our (development team's) primary goal may be getting certification implemented...

- but we can't do this in a vacuum!
  - How does policy affect certification?
  - How does certification affect RIPE NCC's processes?
  - Where does certification fit in the processes?

- There is a **strong interdependence** between technical implementation, processes and policy.
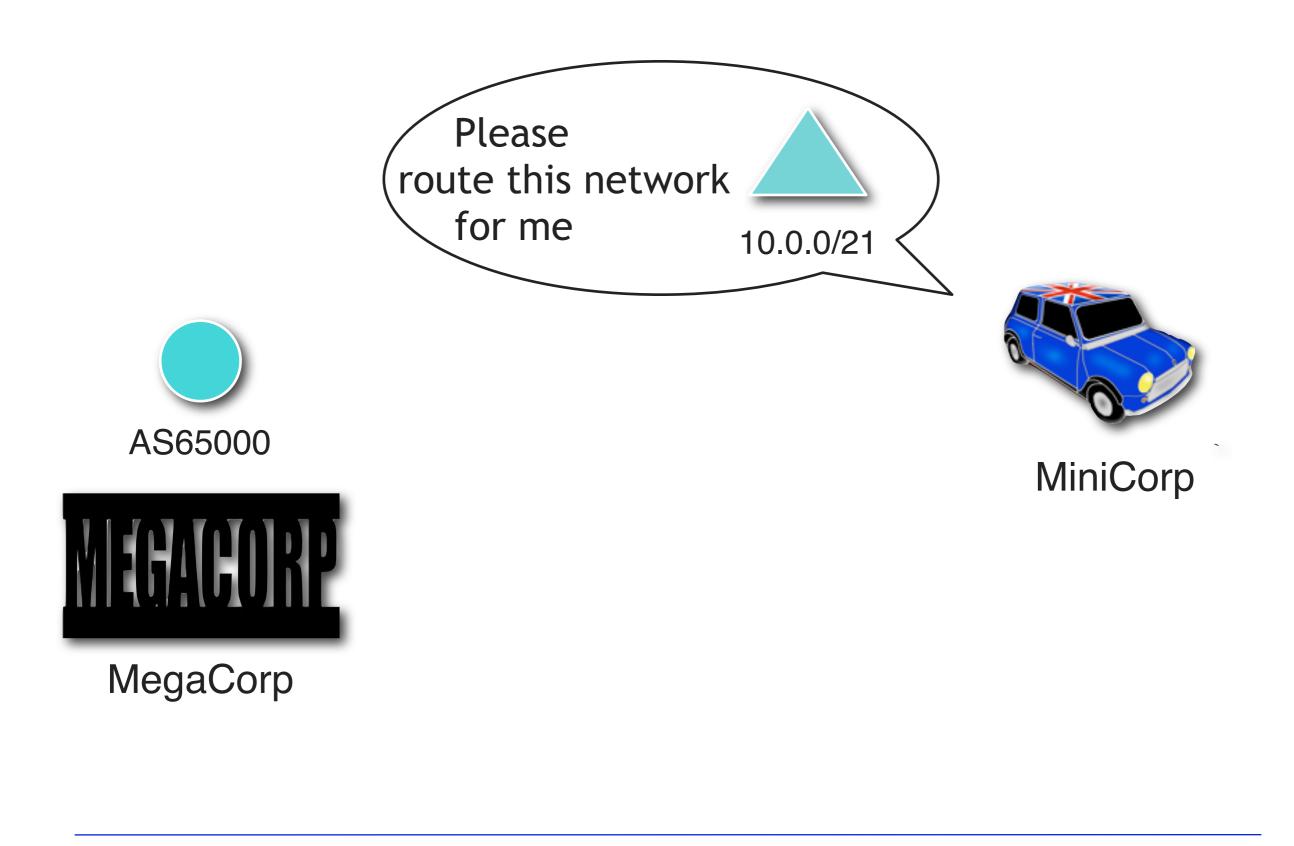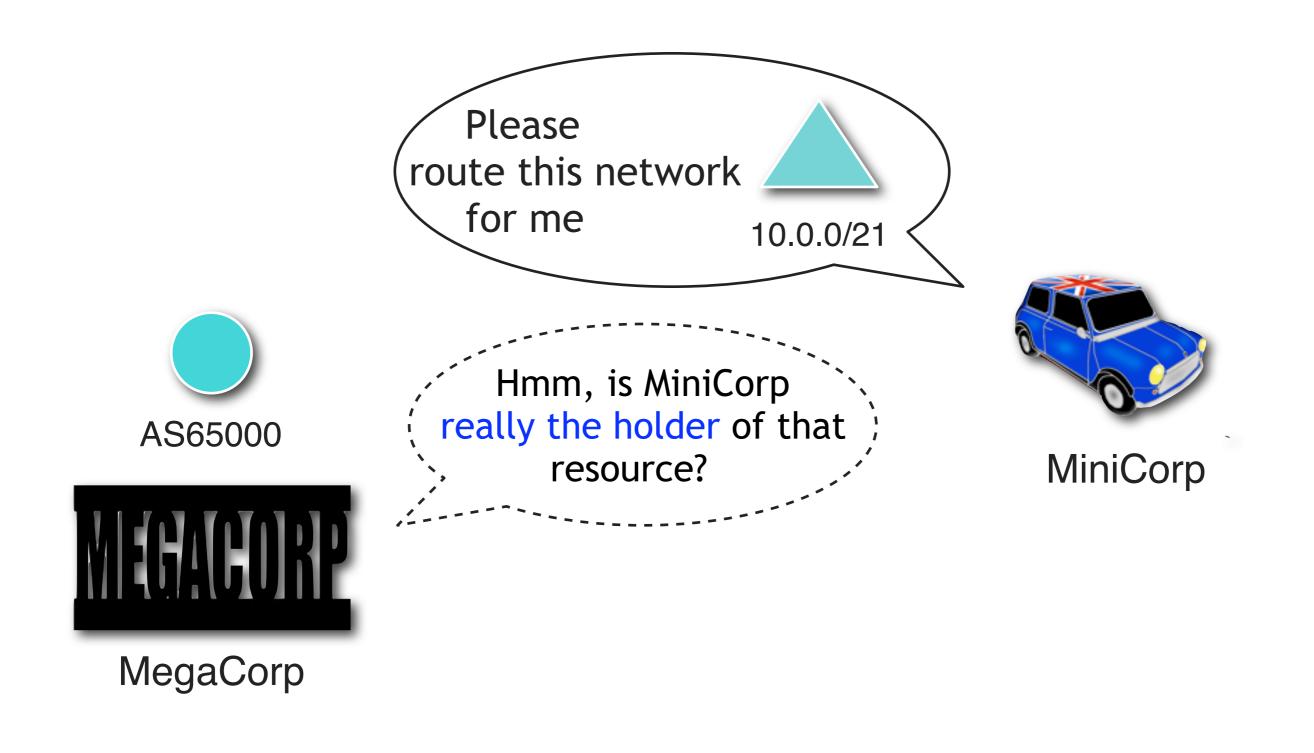
Even more tangible...

Scenario

AS65000

MegaCorp

MiniCorp

10.0.0/21

Scenario

Please route this network for me

10.0.0/21

AS65000

MegaCorp

MiniCorp

Scenario

Please route this network for me

10.0.0/21

AS65000

Hmm, is MiniCorp really the holder of that resource?

MegaCorp

MiniCorp

Automated Provisioning

- Provisioning an IP Resource

  - Does Holder **really** hold the resource?

- Checking takes detective work

  - Takes manpower

  - Needs specific knowledge and skills

- Is there an easy and secure way?

  - Meet the Route Origination Authorization (ROA)

Meet the ROA

"Holder of 10.0.0/21 authorises AS65000 to originate this prefix"

10.0.0/21

AS65000

- Secure: only true holder can create
- One-sided: states permission of address space holder only
- Multiple ROAs for one prefix allowed

Relation ROA — Resource Certificate

10.0.0/21
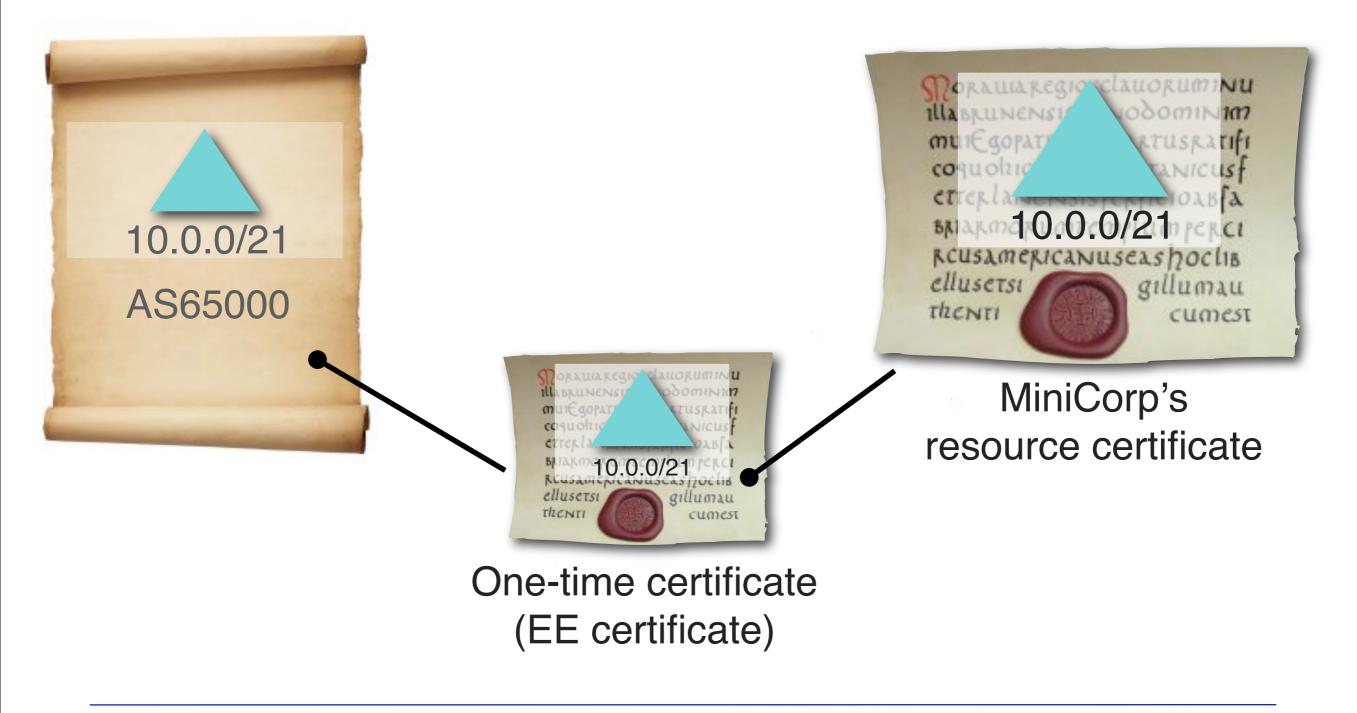
AS65000

Relation ROA — Resource Certificate

10.0.0/21

AS65000

10.0.0/21

MiniCorp's
resource certificate

Relation ROA — Resource Certificate

10.0.0/21

AS65000

10.0.0/21

One-time certificate
(EE certificate)

10.0.0/21

MiniCorp's
resource certificate

Scenario: conversation

Please route this network for me

10.0.0/21

AS65000

MegaCorp

Hmm, is MiniCorp really the holder of that resource?

MiniCorp

Scenario: conversation

Please
route this network
for me

10.0.0/21

Hmm, is MiniCorp
really the holder of that
resource?

MiniCorp

MegaCorp

Okay, please
sign a ROA
with my ASN   AS65000

Demo Automated Provisioning

Thank you!

- RIPE Certification Task Force
  http://www.ripe.net/ripe/tf/certification/index.html

- APNIC Resource Certification Wiki
  http://mirin.apnic.net/resourcecerts/wiki/index.php

- IETF SIDR Working Group
  http://tools.ietf.org/wg/sidr/