



Internet Resource Certification

Enhanced IP Resource Registration

Andrew de la Haye

COO - RIPE NCC

Qatar Regional Meeting, November 2007



Agenda

- Context
- Resource certificates
- Work underway in this area
- RIPE NCC efforts
- Next steps
- Conclusions and questions



Context

Several drivers for enhancements in the Internet resource distribution system

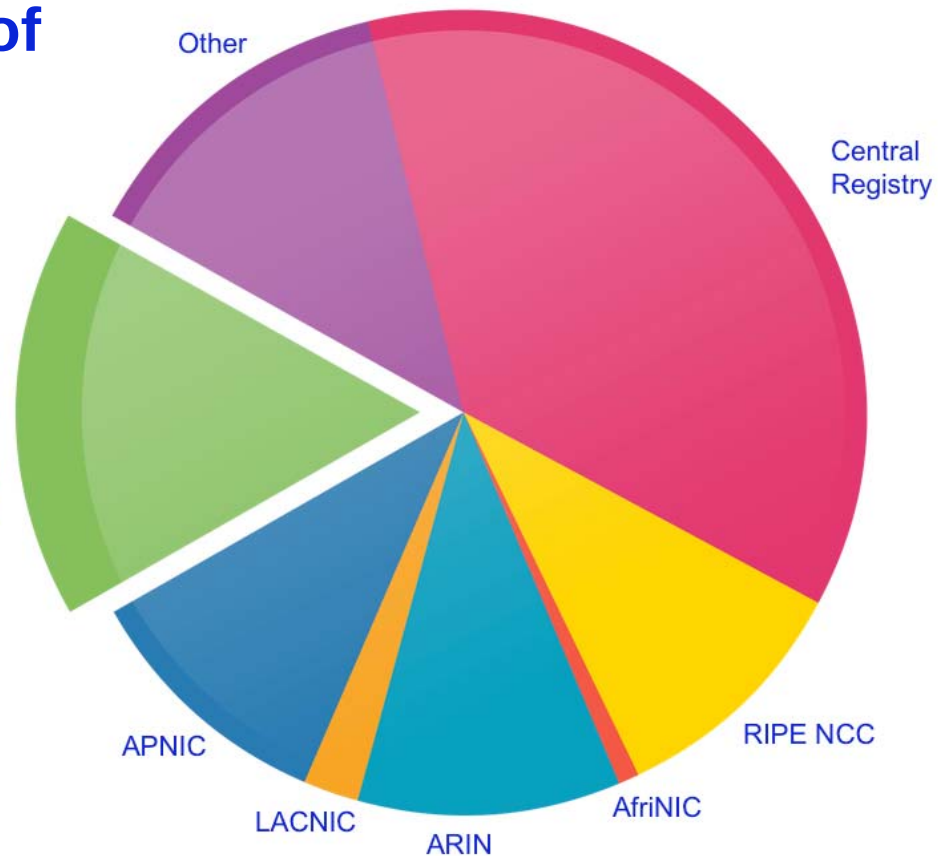
- Impending exhaustion of the free pool of IPv4 address space
- Increase in transfers of resources
- Address and routing security
- Pressure to maintain data quality and provide enhanced resource registration
- The functionality and integrity of the Internet as a services platform
- Capability of sustained growth



Impending exhaustion of the free pool of IPv4 address space

Current distribution of IPv4 address space:

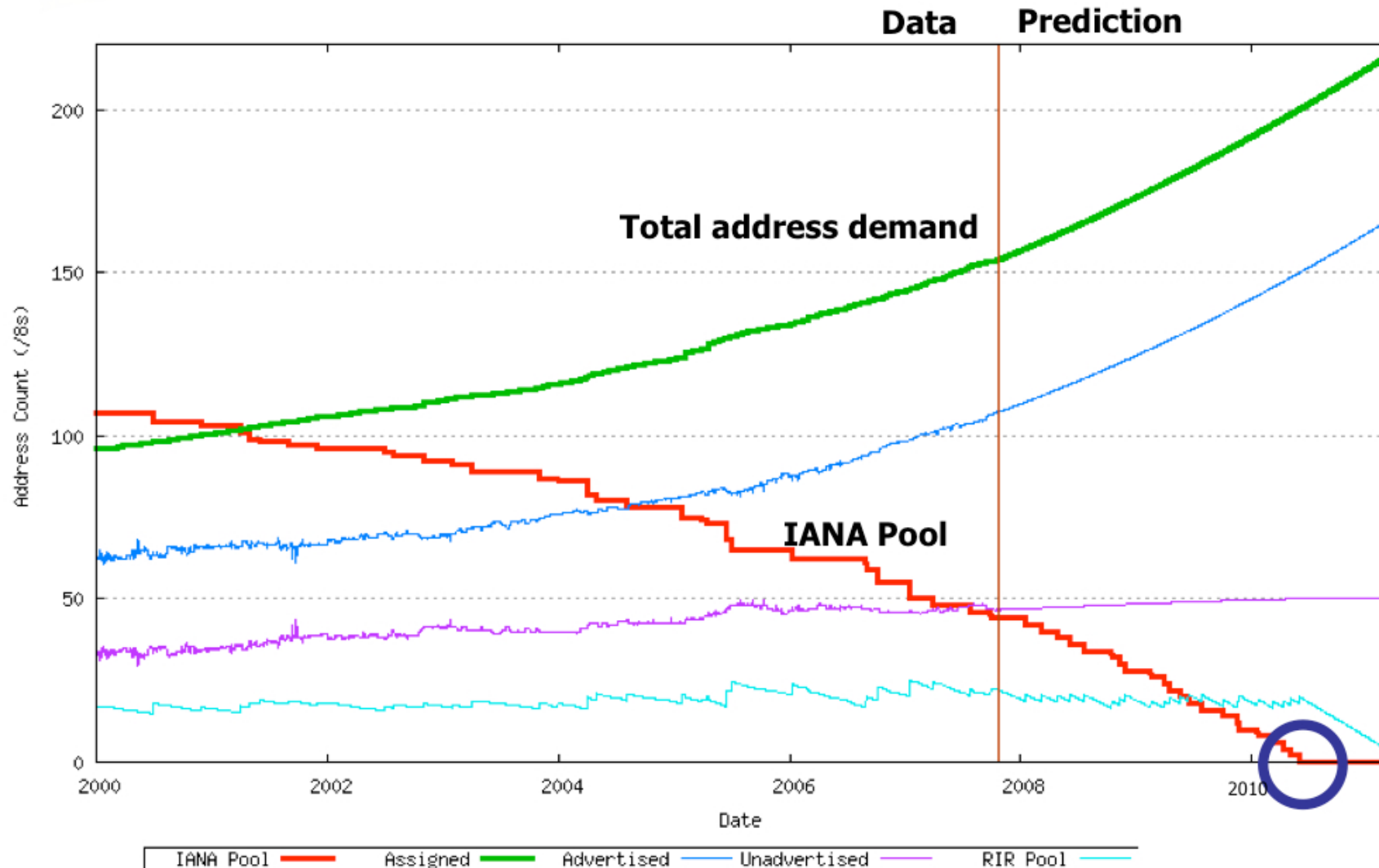
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Impending exhaustion of the free pool of IPv4 address space





IPv4: the current situation

- No straight forward solution/replacement
- IPv4 addresses will continue to be in demand far beyond the date of exhaustion of the unallocated pool
- In the transition (to IPv6) environment, all new and expanding network deployments will need IPv4 service access and addresses for as long as we are in this dual track transition



Transfer of resources

- Sooner or later, we'll run out of IPv4 addresses
 - RIRs will have to say no to requests for new addresses
 - Not every network will be IPv6 ready at this point
 - There will still be a demand for IPv4
- Solution: See if one can get IPv4 from someone other than an RIR!
 - Some may no longer need their IPv4 addresses
 - Buy or borrow, but don't steal
- A system for securely transferring resources is required
- This system can be based on policies developed and agreed on by the community



Address and routing security

- Basic security questions
 - Is this a valid prefix?
 - Who injected it into the network?
 - Is the person who did this authorised to do this?
 - Is the forwarding path acceptable?
 - Can I trust my peer to deliver accurate information?
- Answers have to be
 - Reliable
 - Fast
 - Cheap
- Potential technologies
 - *Improved* Internet Routing Registries
 - DNS/DNSSEC
 - Resource certificates
 - ...



Data quality and enhanced resource registration

- Data quality is increasingly important in this new environment
- RIPE NCC involved in several projects to ensure data quality
 - PI policy proposal
 - Reclamation projects on pending closure LIRs
 - Certification



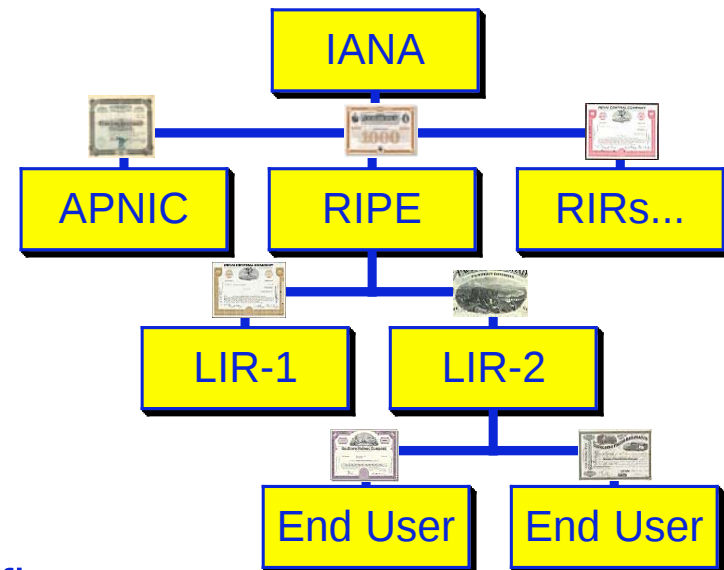
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Resource certificates

- What is a certificate?
 - Structured file with information
 - Signed with a private key
 - X.509 is the standard
- Properties
 - Valid for a certain period
 - Can be revoked
 - Allows for generating subordinate certificates
 - Validity can be checked by walking backwards to the root
- Not that simple:
 - More than technology
 - Also policy, organisational, procedural and legal aspects
 - Should fit into the existing frameworks





Benefits of certification

- Support automated provisioning
- Support transparent and secure resource transfer mechanism
- Support secure routing initiatives
- Enhance resource registration processes



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Work underway in this area

- SIDR-WG/IETF
 - Working group to formulate a standard architecture for a secure inter-domain routing security framework
- ResCert/Inter-RIR coordination
 - Provide a common system across RIRs, discuss common issues amongst RIRs
- Activities at ARIN and APNIC
- RIPE Certification Task Force
 - Provide guidance to the RIPE NCC from an LIR's perspective
 - Act as a sounding board for the RIPE NCC during execution of the project
- RIPE NCC
 - Execution of the actual certification project
 - Evaluate the consequences for the NCC operations and systems



RIPE Certification Task Force (CA-TF)

- Task force assembled at RIPE 53
- Six RIPE community members
- Representation from throughout the region
- Set-up to be part of the trial deployment in the RIPE region during 2007-2008
- Tasked to formulate a report for RIPE 56, as part of community discussion on the way forward



Certification TF scope

- Identify requirements for a number resource certification service
- Follow developments and raise awareness among network operators
- Advise on impact
- Provide recommendations for production development



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RIPE NCC efforts (1)

- 2004-2005
 - Read up
 - Attend workshops / BOFs, followed mailing lists
- 2006
 - Initial studies
 - Understand technology
 - Introduce this to RIPE community:
 - CA Task Force for community input



RIPE NCC efforts (2)

- 2007

- CA-TF 1 discussed high level focus areas (Q1 2007)
- Prototype (back-end) was successfully deployed (Q1-Q2 2007)
- Report @ RIPE 54 (addressed issues)
- Progress on community level: policy area - concrete proposal and viewpoints (Q3 2007)
- RIR-wide effort in the technical and application area result:
 - Understanding that differences in RIR operations mean that RIRs will have to implement specifics themselves
- **Started development of a 0.8 production version, with the goal of validating community requirements**



Current status

- Defined a picture of the landscape
- A first Certification prototype has been delivered supporting the identification of impacted areas
- Five main areas will be the focus of research and discussion and execution of a preliminary implementation:
 - **Business area (including impact on policies)**
 - Services area
 - Technical area
 - RIR wide area
 - Application area



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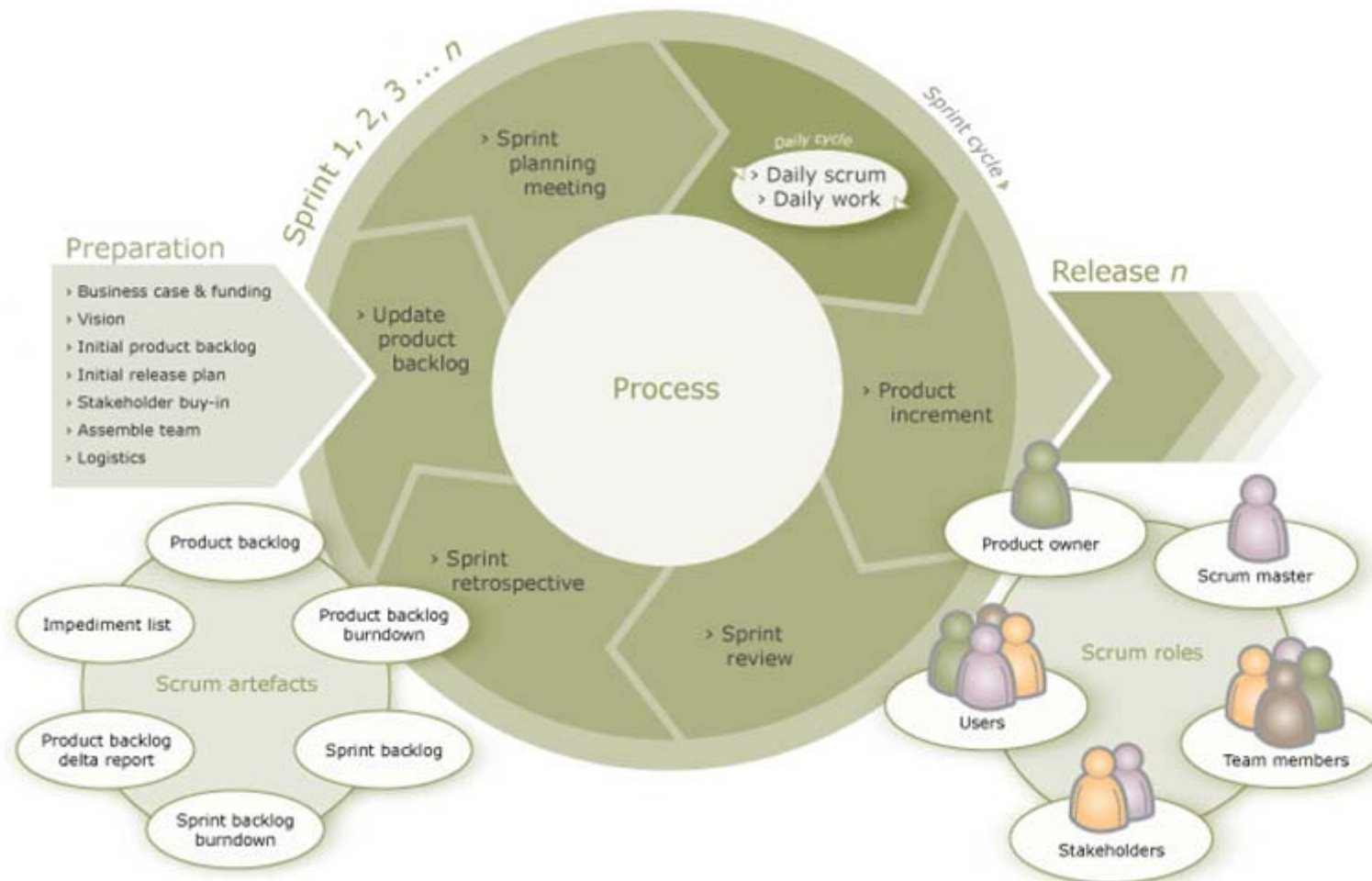


Next steps

- Moving towards an actual certification service offered by the RIPE NCC to members (0.8 version)
- Deliverables:
 - Produce a system that supports all operations needed by a future RIPE NCC certification service
 - Hardware
 - Software
 - Documentation (both technical and user)
 - Produce components that can be used by the community
 - Draft proposals for new or modified policies

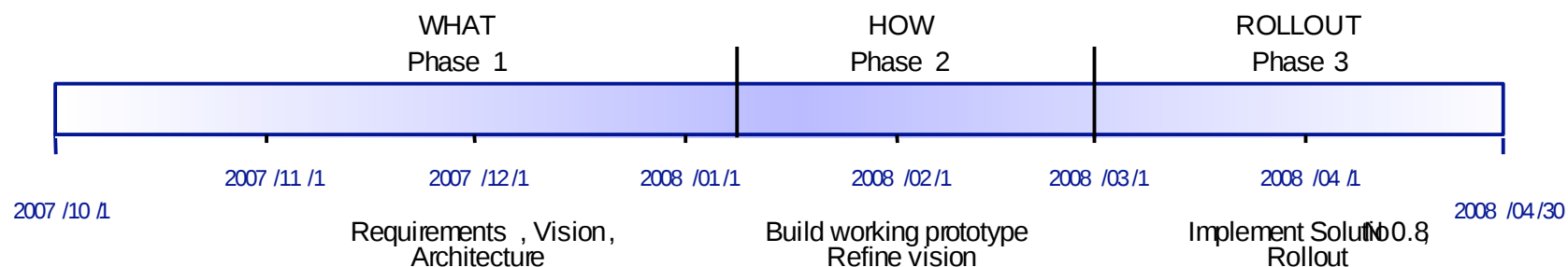


Project approach





Preliminary Timeline



Key dates

- 01.02.2008 – Demo results of assignment 1 for task force
- 01.04.2008 – Version 0.8 deployment for review by task force
- 01.05.2008 – Report @ RIPE 56



Pointers and URLs

- SIDR WG
 - <http://www.ietf.org/html.charters/sidr-charter.html>
 - 6 architecture documents
 - Read and comment!
- RESCERT:
 - <http://mirin.apnic.net/resourcecerts/wiki/index.php>
 - Information repository
- CA-TF
 - <http://www.ripe.net/ripe/tf/certification>
 - Public website of closed group



Conclusions

- New trends in the industry may require certification of resources
- RIRs have to be ready to issue certificates
- RIPE NCC is on its way to providing this service

Questions?

