The Regional Internet Registry (RIR) System

J. Curran / IGF 2009

Regional Internet Registries

- There are five RIRs that, combined, serve the Internet number resource needs of all organizations worldwide.

- These nonprofit organizations manage number resources in their respective regions according to policies set by their communities in conformance with IETF standards.

- Each RIR develops its policies for address management via open and transparent processes, and coordinate together on the development of global address policies.

ARIN
American Registry for Internet Numbers

Policy Development Process

BOTTOM-UP

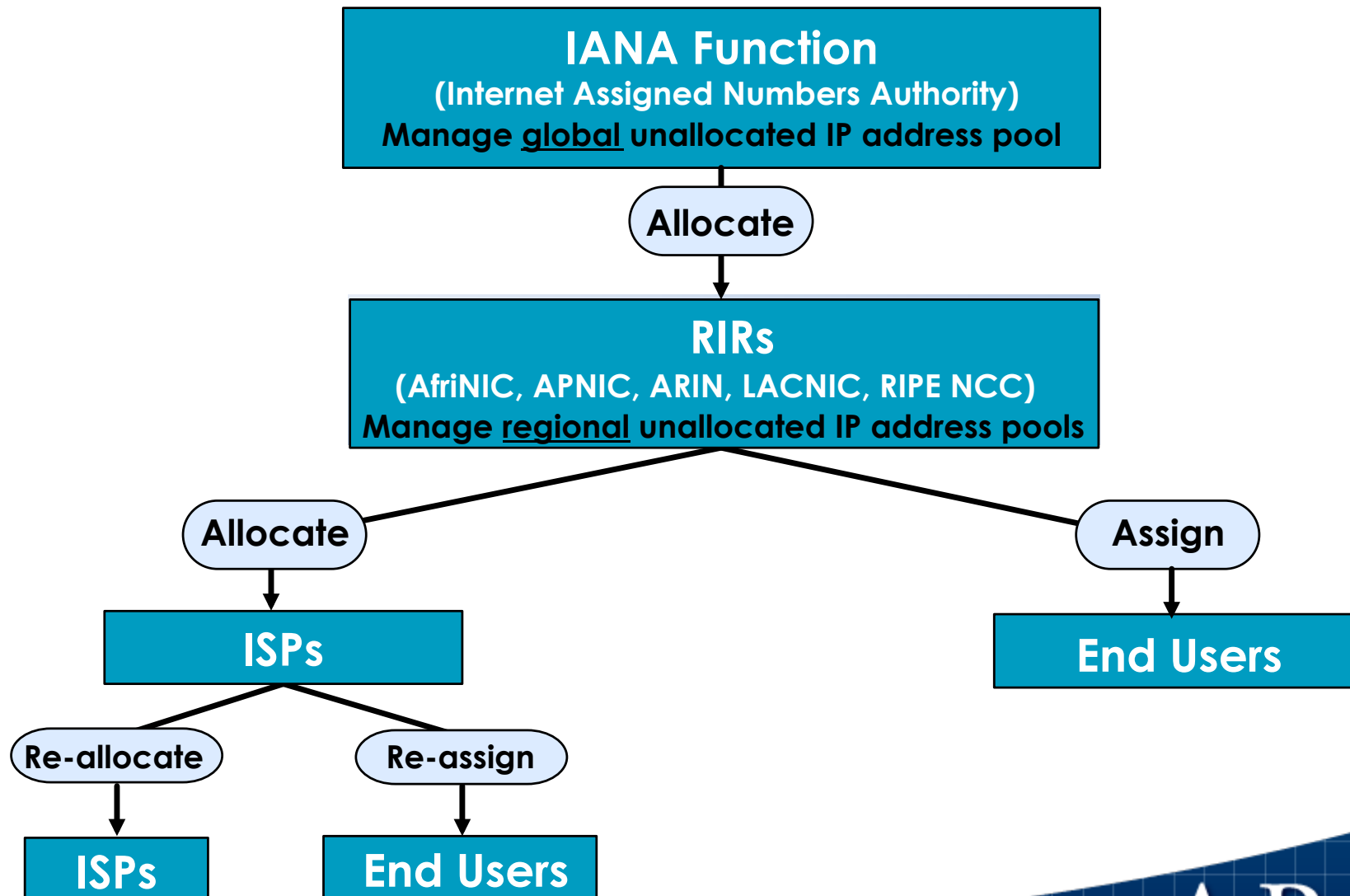Community Proposes, Discusses, and Approves Policy

OPEN

Open Participation

- Accessible (email, remote, onsite)
- Inclusive (business, government, civil society, end user, ...)

TRANSPARENT

Documented, Published & Accessible Process, Policies, and Procedures

ARIN
American Registry for Internet Numbers

Number Resource Provisioning Hierarchy

IANA Function
(Internet Assigned Numbers Authority)
Manage global unallocated IP address pool

Allocate

RIRs
(AfriNIC, APNIC, ARIN, LACNIC, RIPE NCC)
Manage regional unallocated IP address pools

Allocate

Assign

ISPs

End Users

Re-allocate

Re-assign

ISPs

End Users

Principles of Address Management

Address space conservation

"Fair distribution of globally unique Internet address space according to the operational needs of the end-users and Internet Service Providers operating networks using this address space."

Aggregation of routing

"Distribution of globally unique Internet addresses in a hierarchical manner, permitting the routing scalability of the addresses. This scalability is necessary to ensure proper operation of Internet,…"

Registration

"Provision of a public registry documenting address space allocation and assignment. This is necessary to ensure uniqueness and to provide information for Internet trouble shooting at all levels."

Source: IETF RFC 2050, ICANN/NRO ICP-2

Internet Routing and Aggregation

<u>Routing Internet Address Blocks</u>

- In addition to configuring equipment with Internet addresses from an address block, the paths by which each unique address block is connected to the Internet must be redistributed globally. This information must be updated in the high-speed backbone routers of all major ISPs, so that the "*routing*" to each and every Internet destination is continuously available and full connectivity is maintained for all.
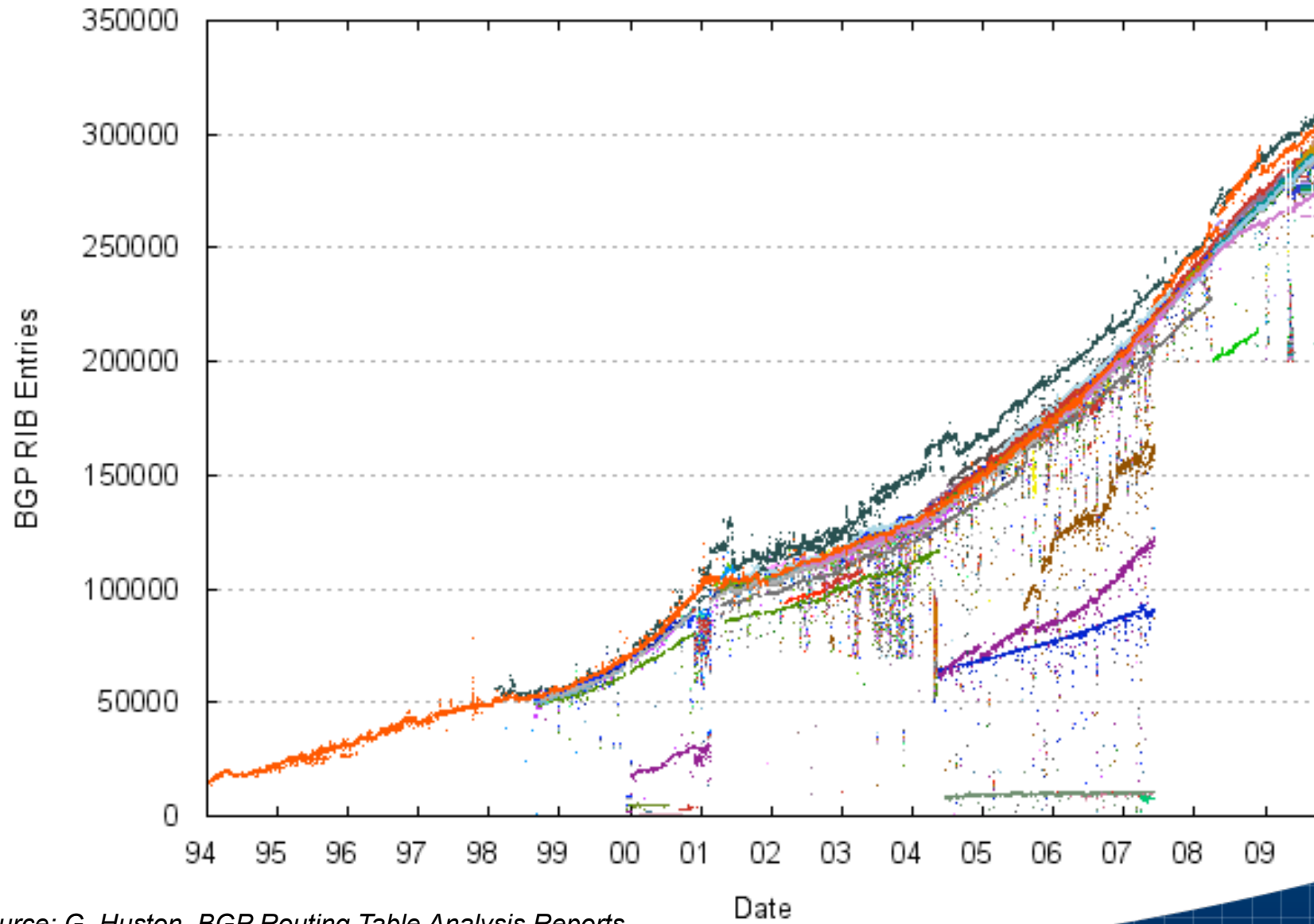
<u>Aggregation of *Provider Assigned (PA)* Addresses</u>

- An ISP that receives an allocation from its RIR can route that single address block to the global Internet, and proceed to make address assignments to end users. These are often referred to as "Provider Assigned" addresses.

<u>*Provider Independent (PI)* Addresses</u>

- Assignments from RIRs direct to end users do not aggregate and require unique entry into the global routing tables.

ARIN
American Registry for Internet Numbers

Global Internet Routing Table

ARIN
American Registry for Internet Numbers