



APNIC



RIRs & IPv6



Prepared by
Regional Internet Registries
APNIC, ARIN, LACNIC and RIPE NCC

Overview

- IP Address Management
- Internet Number Resource Management Policy Development
- IPv6 Policy
- Internet Number Resource Status

IP Address Management



How is IP Address Space Managed

How is IP Address Space Managed

- Address Space Management Objectives

How is IP Address Space Managed

- Address Space Management Objectives
- Implementation of Policy

Conservation



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graph TD; Conservation --> AMO[Address Management Objectives]; AMO --> Aggregation; AMO --> Registration;
```

Address Management Objectives

Aggregation

Registration

Conservation

- Efficient Use of Resources
- Based on Need

Address Management Objectives

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Address Management Objectives

Aggregation

- Limit Routing Table Growth
- Support Provider-Based Routing Policies

Registration

Conservation

- Efficient Use of Resources
- Based on Need

Address Management Objectives

Aggregation

- Limit Routing Table Growth
- Support Provider-Based Routing Policies

Registration

- Ensure Uniqueness
- Trouble Shooting

Policy Implementation [Industry Self-Regulation]

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- RIR Staffs
 - Publish Policy Documents
 - Publish Procedure Documents
 - Implement Policy

Policy Implementation [Industry Self-Regulation]

- RIR Staffs
 - Publish Policy Documents
 - Publish Procedure Documents
 - Implement Policy
- ISP/LIR
 - Develop Internal Procedures
 - Implement Policy

Internet Number Resource Management Policy Development [Industry Self-Regulation]



How is IP Address Policy Developed?

How is IP Address Policy Developed?

- According to Policy Development Principles

How is IP Address Policy Developed?

- According to Policy Development Principles
- In a Cyclical Manner

Policy Development Principles



Policy Development Principles



- Open

Policy Development Principles



- **Open**
 - Anyone Can Participate
 - Policy Fora
 - Mail Lists

Policy Development Principles

- **Transparent**



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Policy Development Principles

- **Transparent**
 - Mail List Archives
 - Minutes
 - Policy Fora
 - RIR Boards
- **Open**
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Policy Development Principles

- **Transparent**

- Mail List Archives

- Minutes

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- RIR Boards

- **Documented**



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Policy Development Principles

- **Transparent**
 - Mail List Archives
 - Minutes
 - Policy Fora
 - RIR Boards
- **Documented**
 - Formal Policy Documents
 - Implementation Procedures
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Policy Development Principles

- **Transparent**
 - Mail List Archives
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- **Documented**
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- **Open**
 - Anyone Can Participate
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- **Developed Bottom-Up**



Policy Development Principles

- **Transparent**

- Mail List Archives
- Minutes
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 - RIR Boards



- **Open**

- Anyone Can Participate
- Policy Fora
- Mail Lists

- **Documented**

- Formal Policy Documents
- Implementation Procedures

- **Developed Bottom-Up**

- Internet Community
- Stakeholders
- Technology Changes
- IETF

Policy Development Cycle



Policy Development Cycle



Need

Technology Changes
Industry Requirements

Policy Development Cycle

Discuss

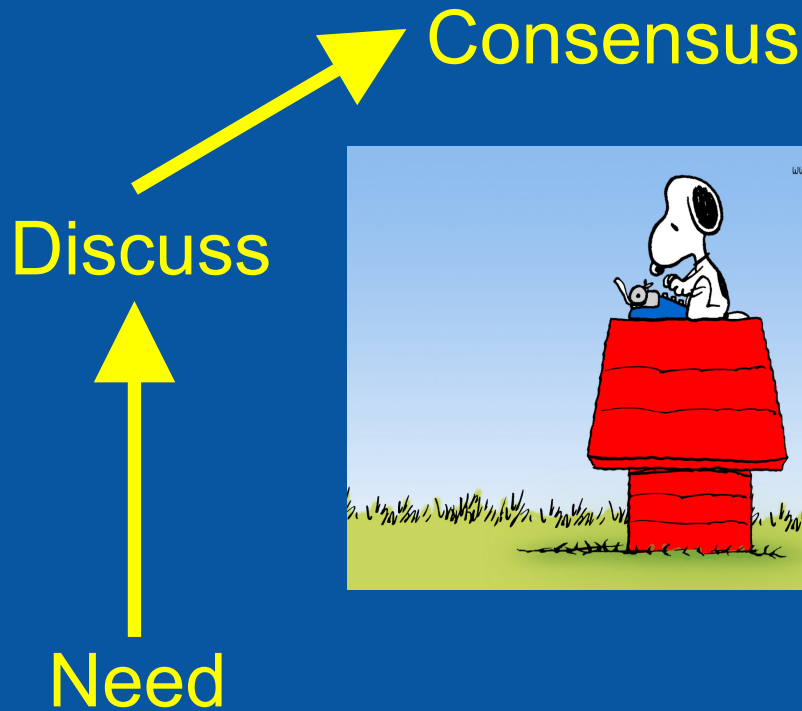


Need



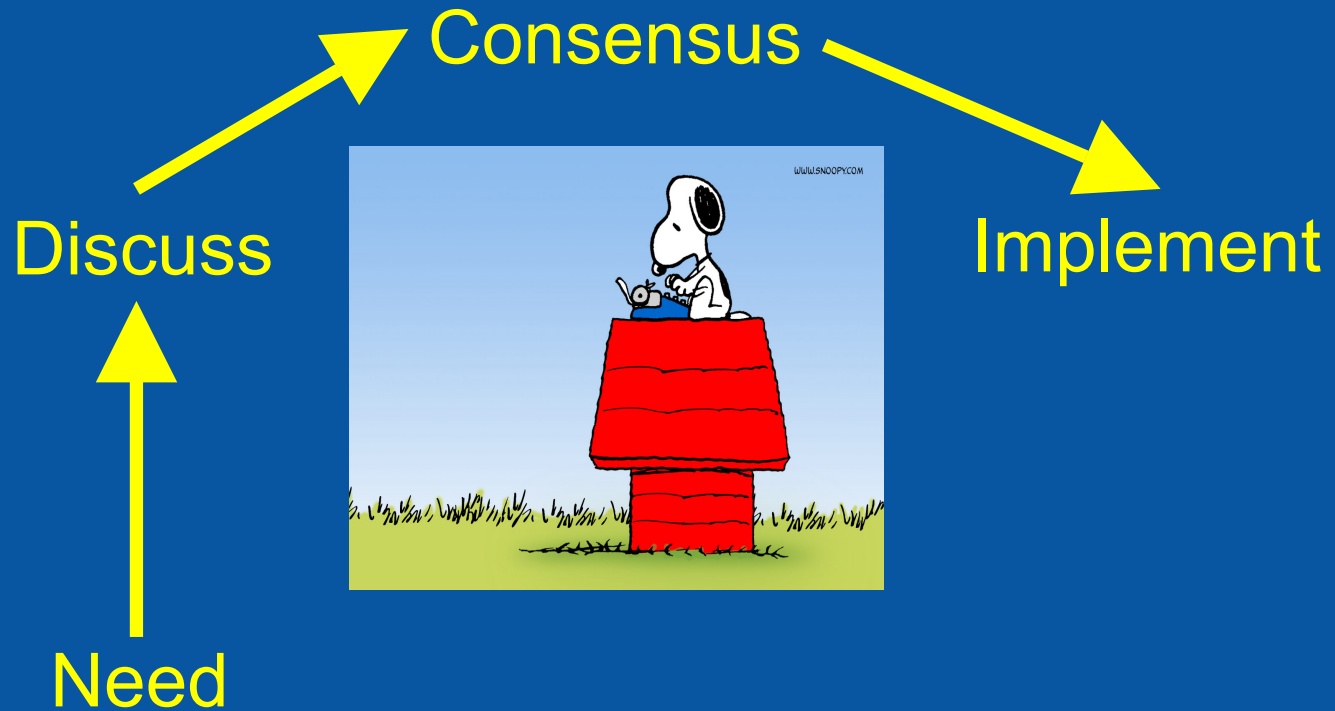
Email Lists
Open Policy Meetings

Policy Development Cycle



Structured Assessment Process

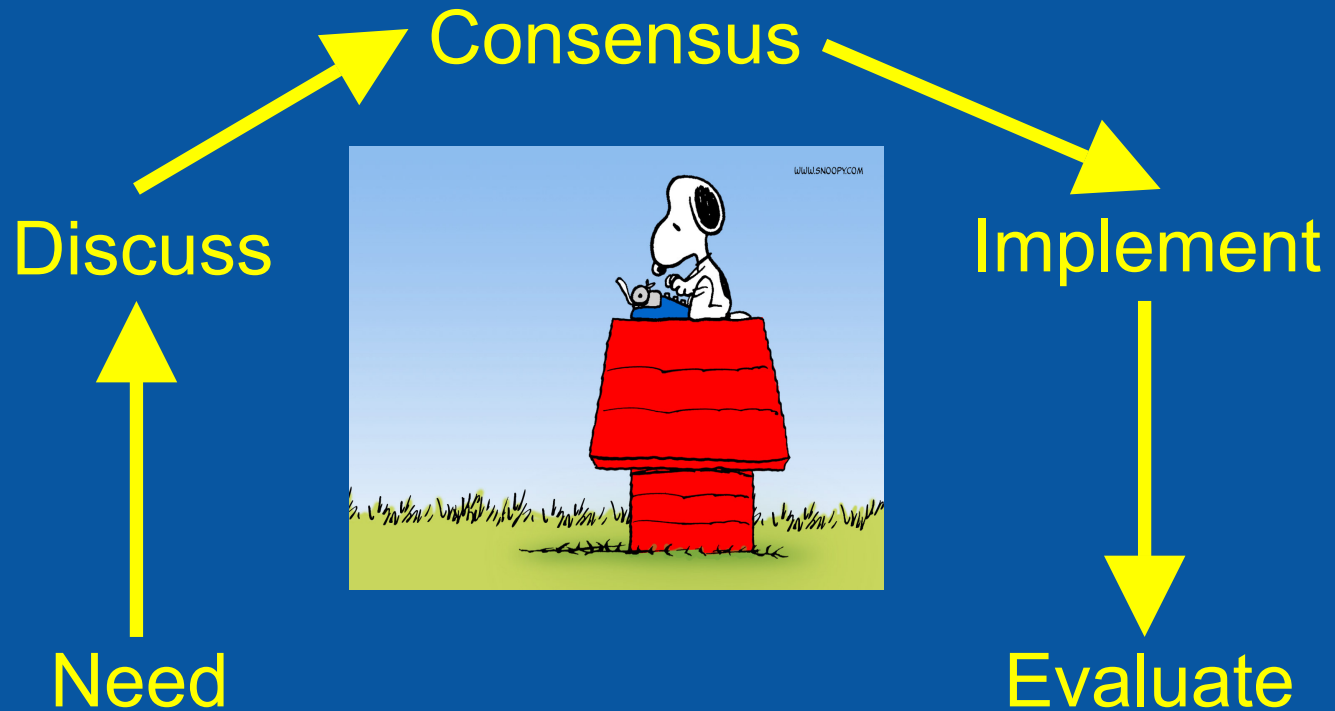
Policy Development Cycle



Put Into Practice

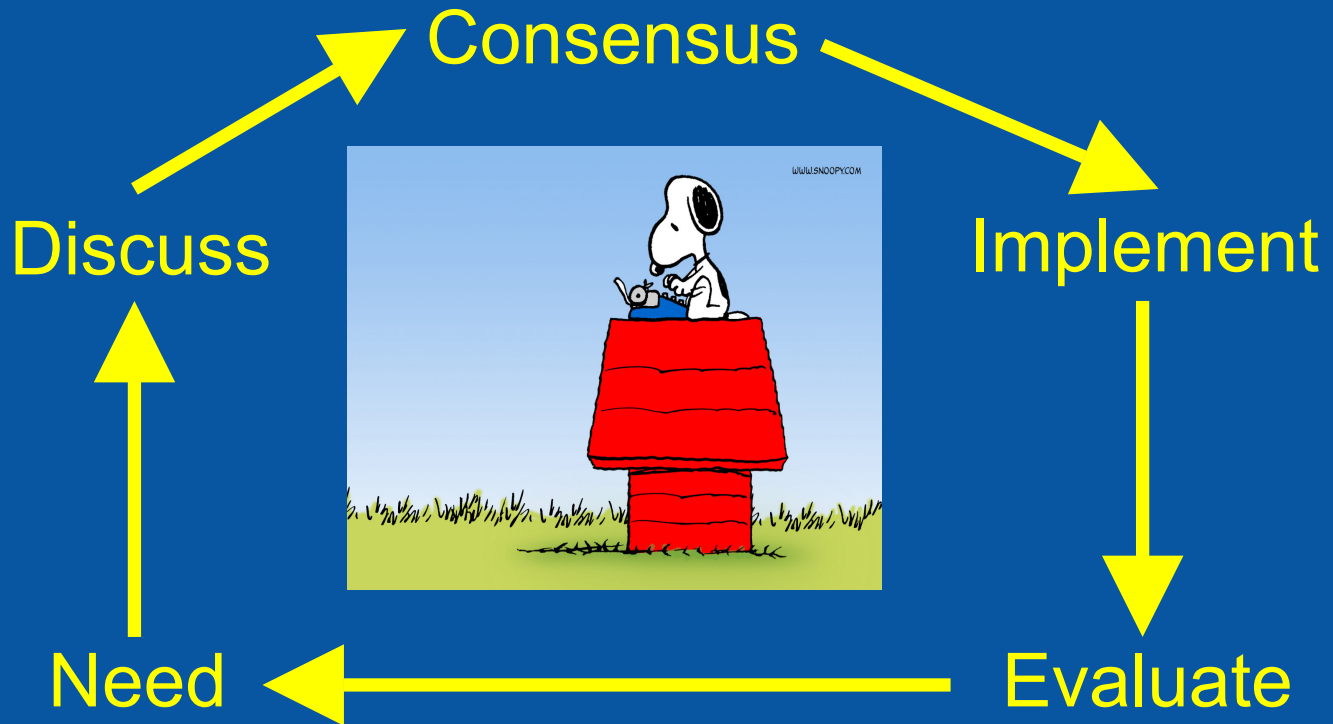
- Staff
- ISP/LIR

Policy Development Cycle



Affect on Industry
Interaction with Technology

Policy Development Cycle



RIR Public Policy Meetings

- ARIN (2 per year)
- APNIC (2 per year)
- LACNIC (2 per year)
- RIPE NCC (3 per year)

IPv6 Policy



IPv6 Policy History

- **Apr 1999** – Joint RIR Consensus
 - Interim Policy
 - IPv6 Allocations Begin
- **Oct 1999** – Policy Review Begins
- **Jun 2001** – Joint RIR Consensus
 - Policy and Technical Boundaries
 - End Site Assignments [RFC 3177]
- **May 2002** – Joint RIR Consensus
 - Initial Allocation Size to ISP/LIR
 - Initial Allocation Criteria

Assignments by ISP/LIR

RFC 3177 "IAB/IESG Recommendations on IPv6 Address Allocations to Sites"

Assignments by ISP/LIR

ISP/LIR to End Site

- /48
 - Usual Assignment Size
 - 16 bits for subnets
- /64 only one subnet
- /128 one device connecting

RFC 3177 “IAB/IESG Recommendations on IPv6 Address Allocations to Sites”

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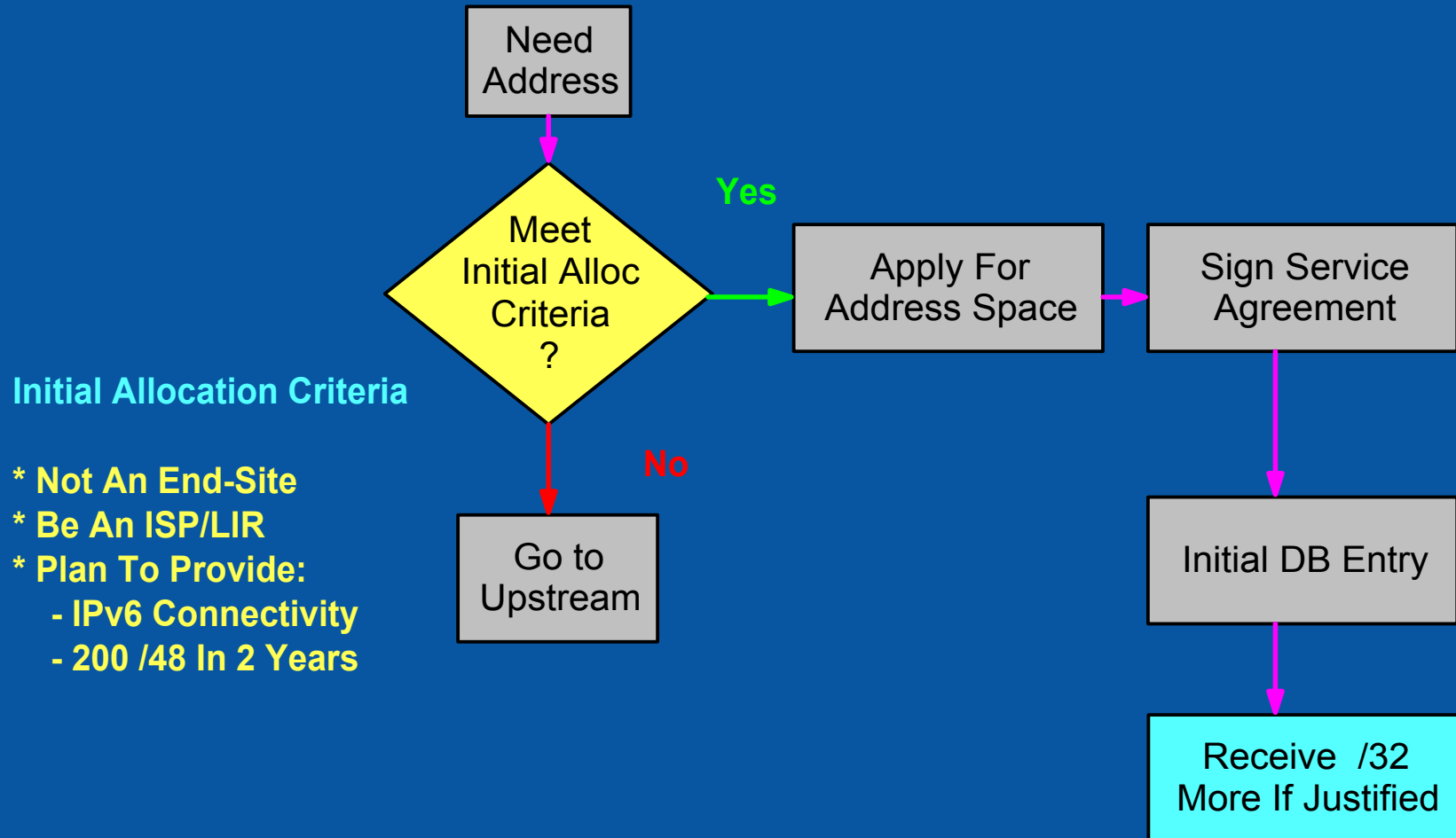
ISP

Infrastructure

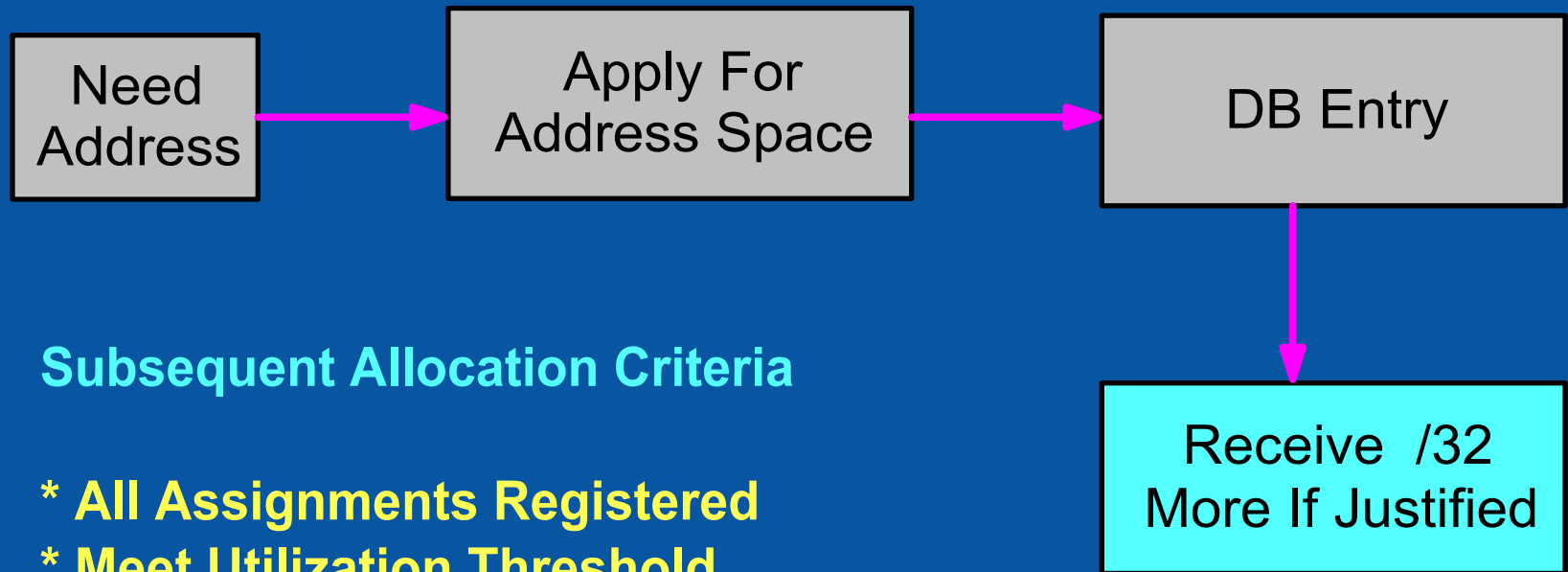
/48 per POP

RFC 3177 “IAB/IESG Recommendations on IPv6 Address Allocations to Sites”

IPv6 Initial Allocation Criteria & Process



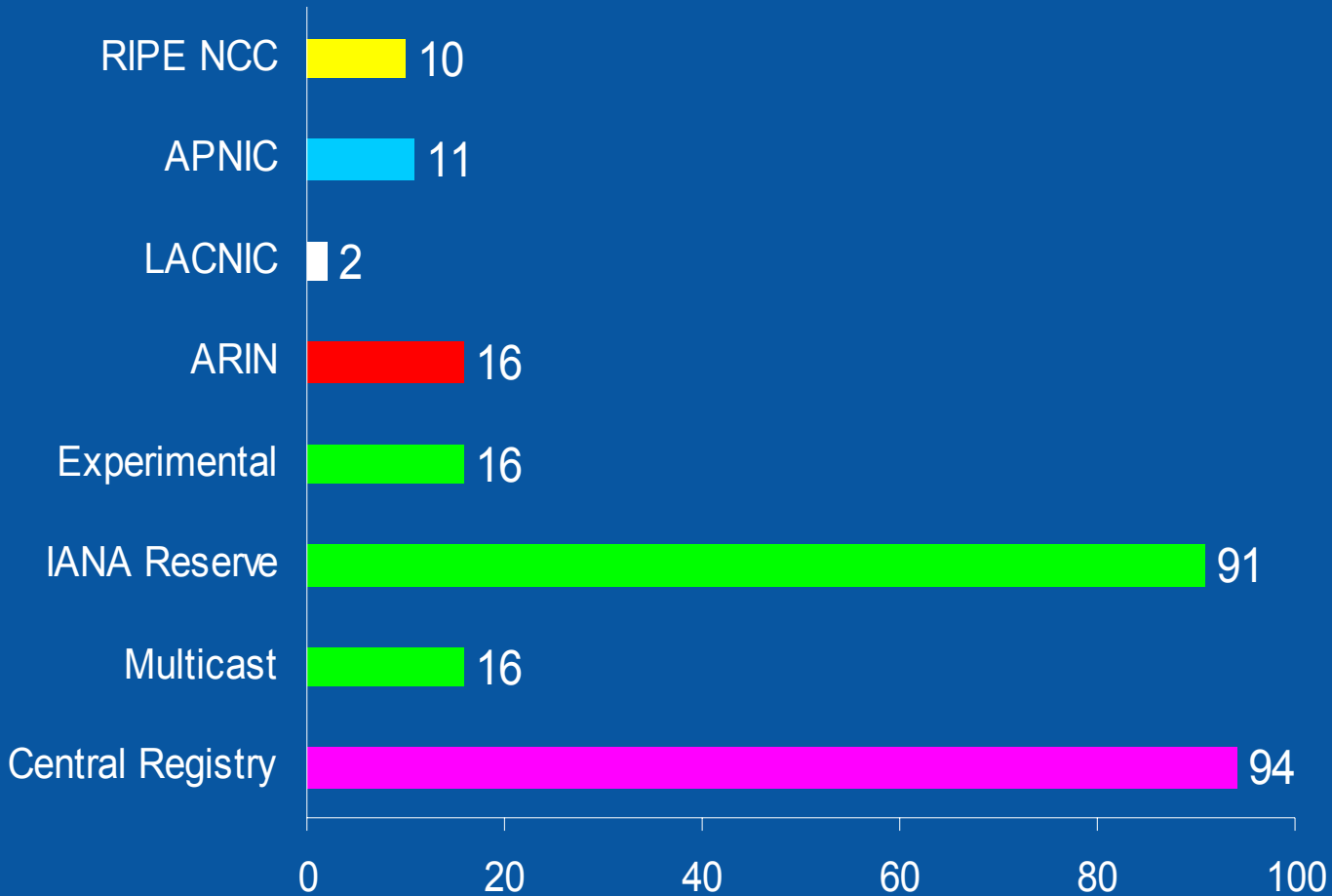
Subsequent Allocation Criteria & Process



INTERNET NUMBER RESOURCE STATUS REPORT



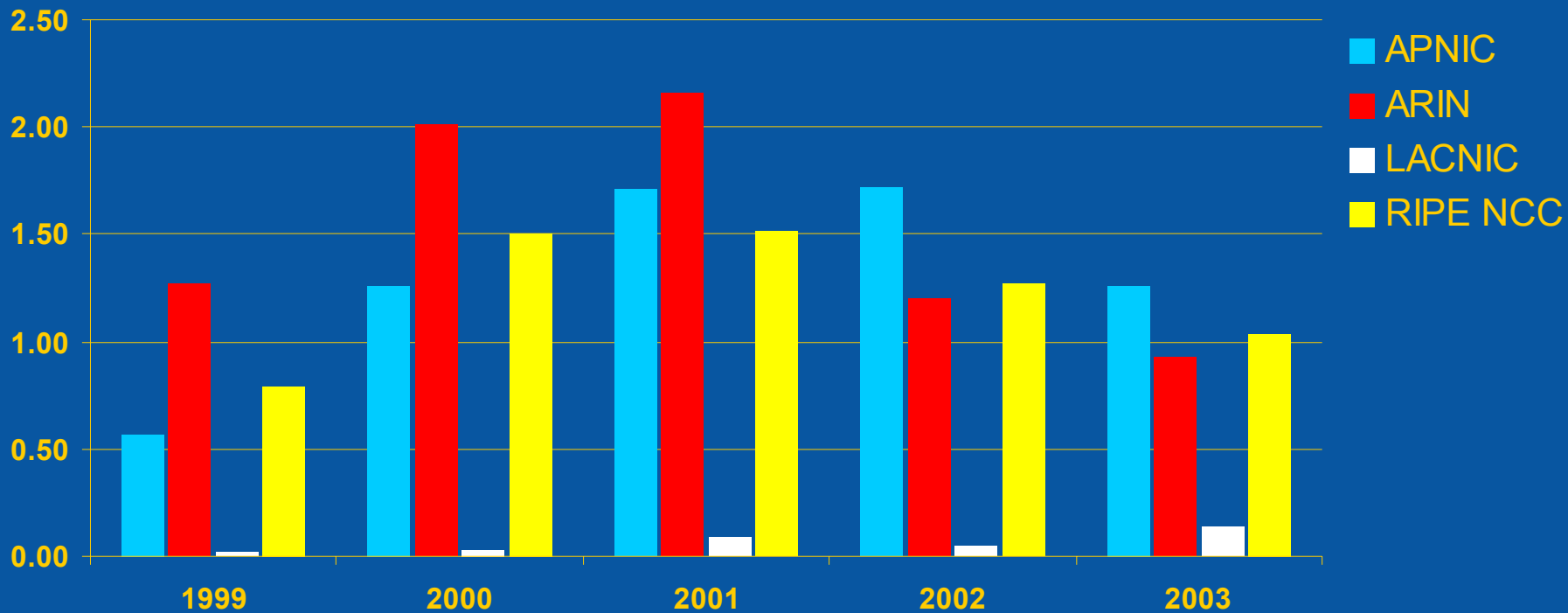
IPv4 /8 Address Space Status



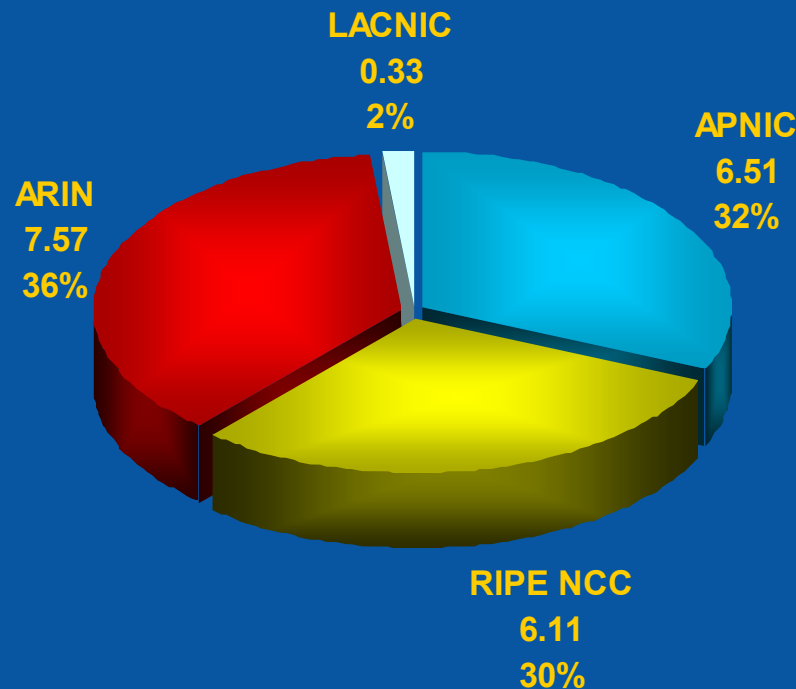
IPv4 Allocations from RIRs to LIRs/ISPs

Yearly Comparison

30 September 2003



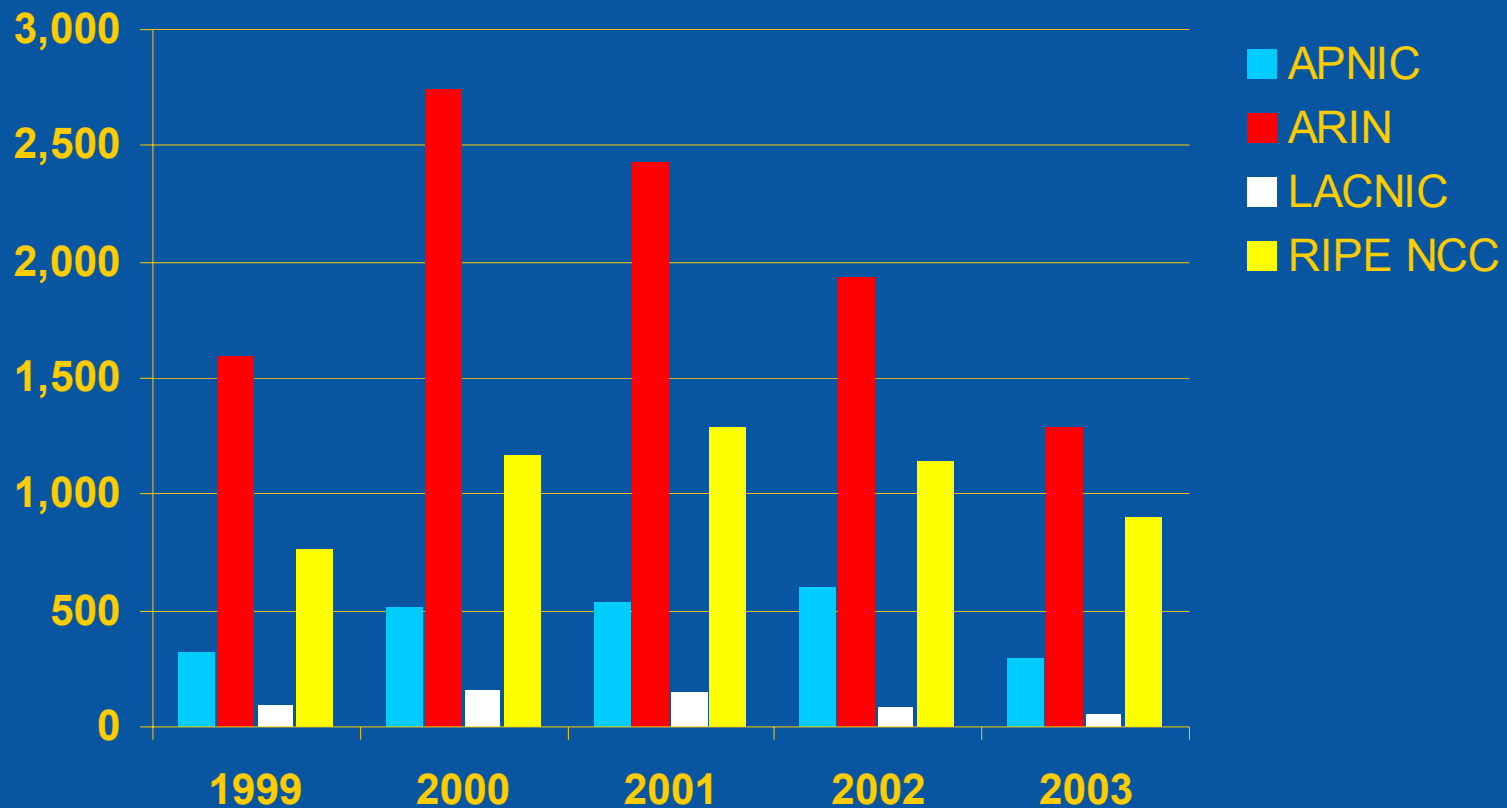
IPv4 Allocations from RIRs to LIRs/ISPs Cumulative Total (1 January 1999 – 30 September 2003)



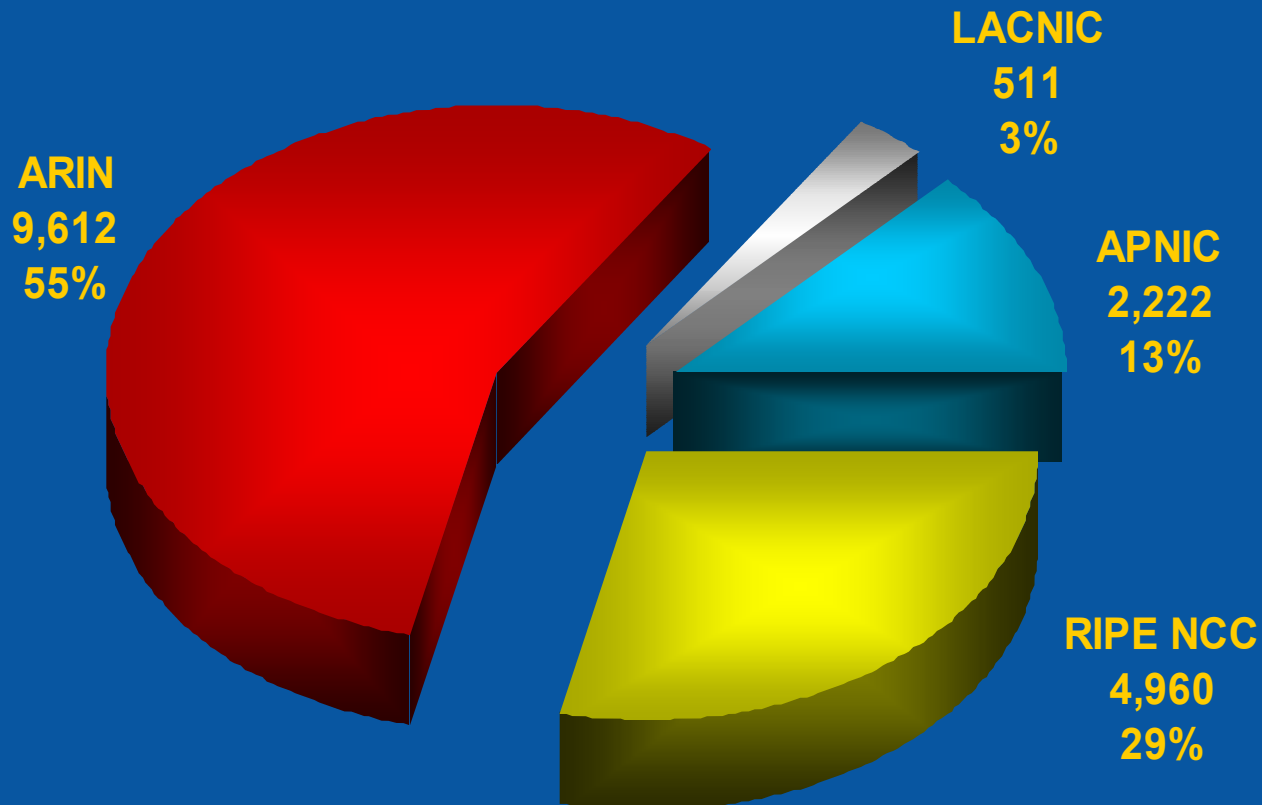
ASN Assignments from RIRs to LIRs/ISPs

Yearly Comparison

30 September 2003



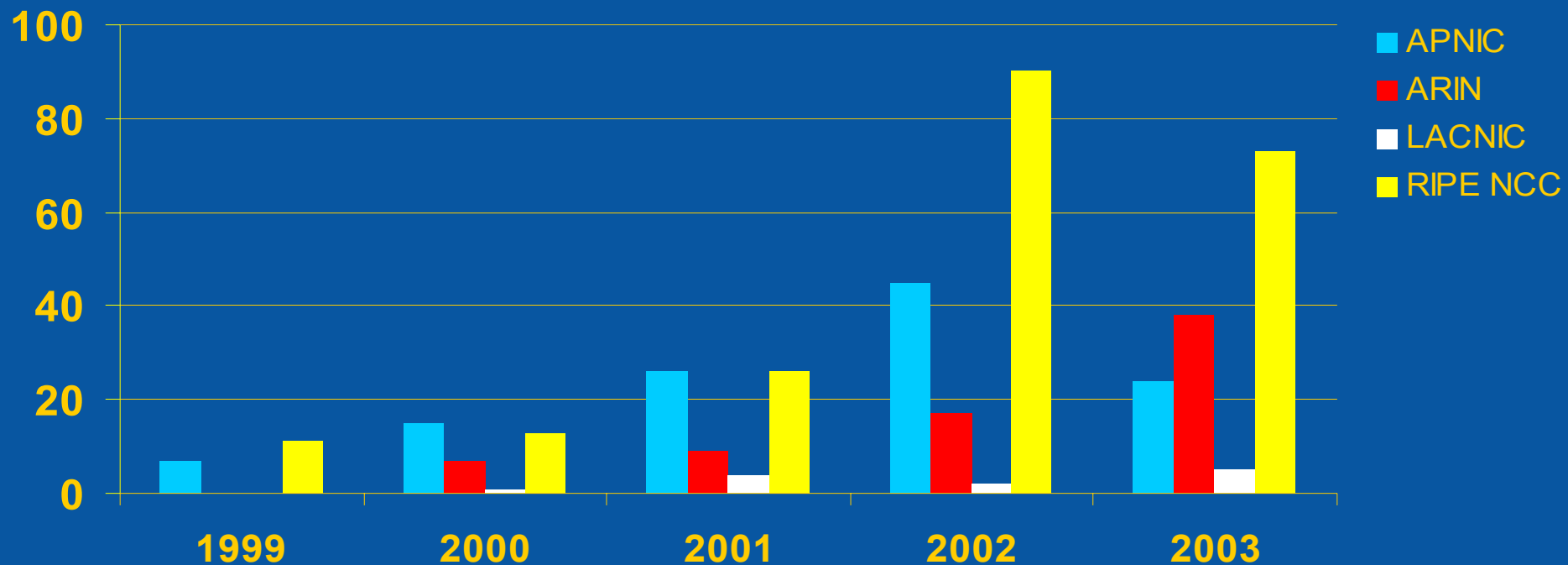
ASN Assignments from RIRs to LIRs/ISPs Cumulative Total (1 January 1999 – 30 September 2003)



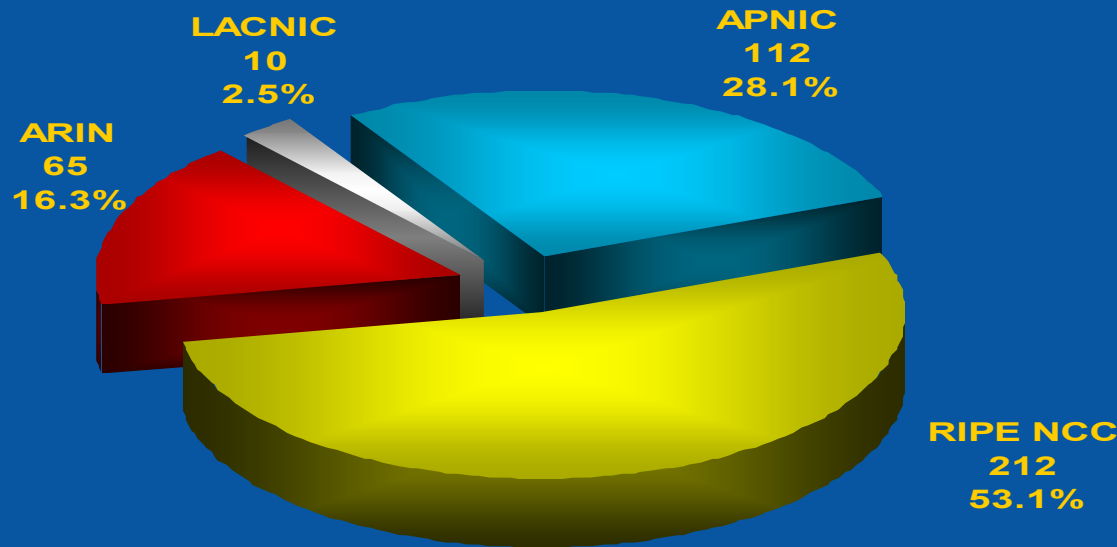
IPv6 Allocations from RIRs to LIRs/ISPs

Yearly Comparison

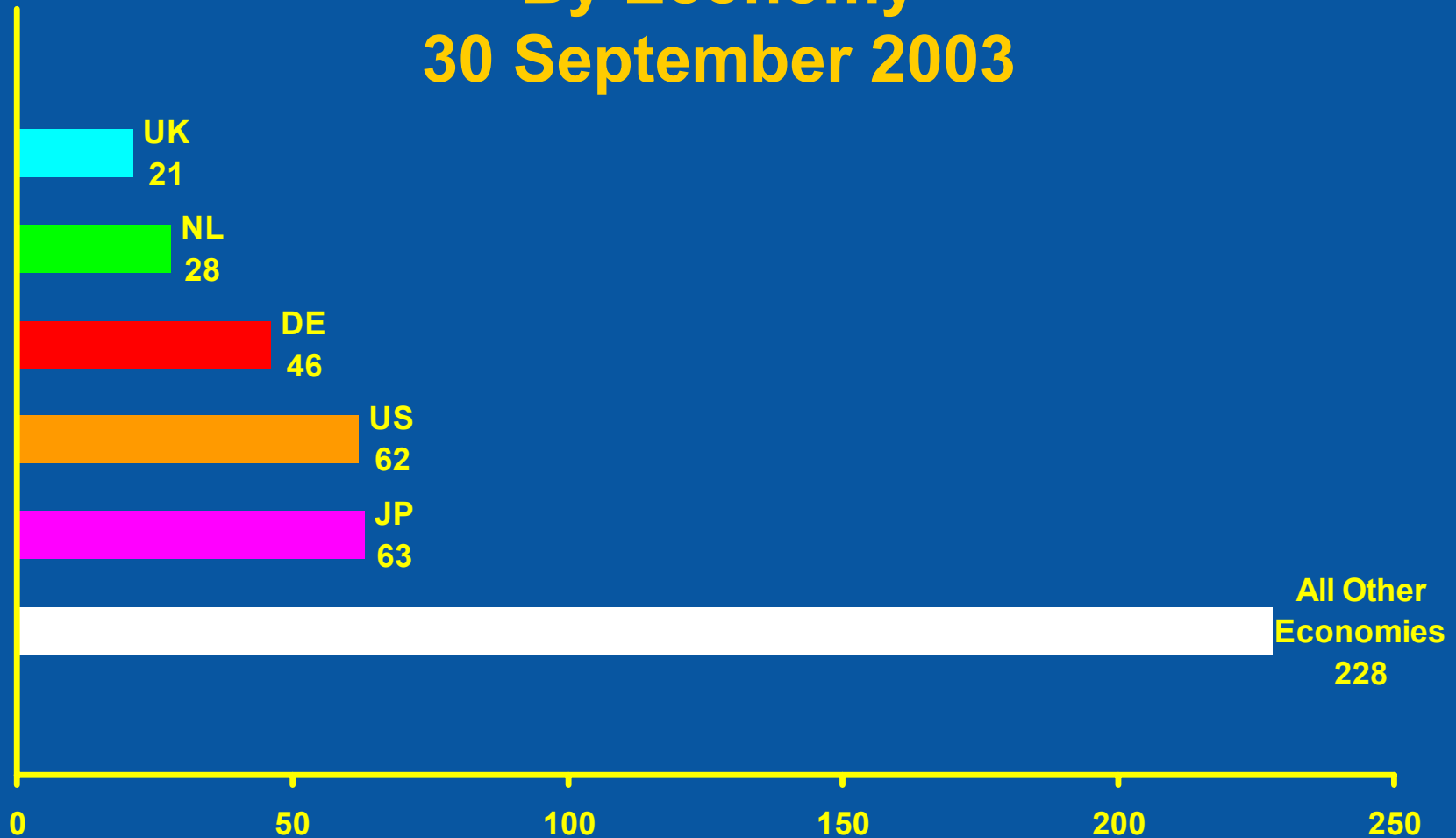
30 September 2003



IPv6 Allocations from RIRs to LIRs/ISPs Cumulative Total (1 January 1999 – 30 September 2003)



Total IPv6 Allocations from RIRs to LIRs/ISPs By Economy 30 September 2003



Number Resources in Africa

Source	IPv4 (/24)	IPv6 (/32)	ASN
APNIC	48	0	1
ARIN	32,178	3	121
RIPE NCC	5,664	1	57
TOTAL	37,890	4	179

Links to RIR Statistics

Raw Data/Historical RIR Allocations:

<http://www.aso.icann.org/rirs/stats/index.html>

<http://www.iana.org/assignments/ipv4-address-space>

RIR Stats:

<http://www.apnic.net/info/reports/index.html>

<http://www.arin.net/statistics/index.html>

<http://www.lacnic.net/en/est.html>

<http://www.ripe.net/ripenncc/pub-services/stats>

THANK YOU



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