

IPv6 Addressing Technology and Policy Developments

APNIC

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Overview

- Background
- Boundaries - old and new
- Technology vs. Policy
- Policy issues (I ANA, RI Rs, LI Rs, I SPs)
- Document status
- Next steps

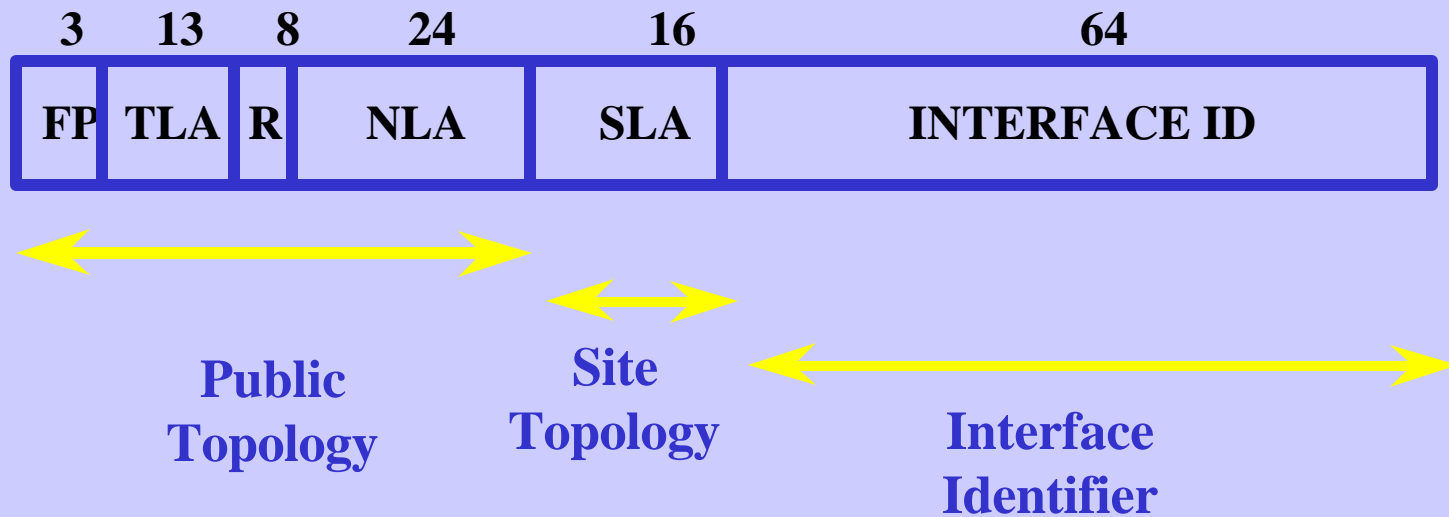
Background

- 1998: initial discussions RI Rs / IETF
- Jul 1999: initial RI R policy document
- Aug 1999: RI Rs started allocating
- Sep 2000: IAB/I ESG recommends (/48)
 - Discussion between IETF, RI Rs, and ISPs intensified
- 2001: I ESG doc revision
 - RI Rs / IETF discussion intensified

Goals

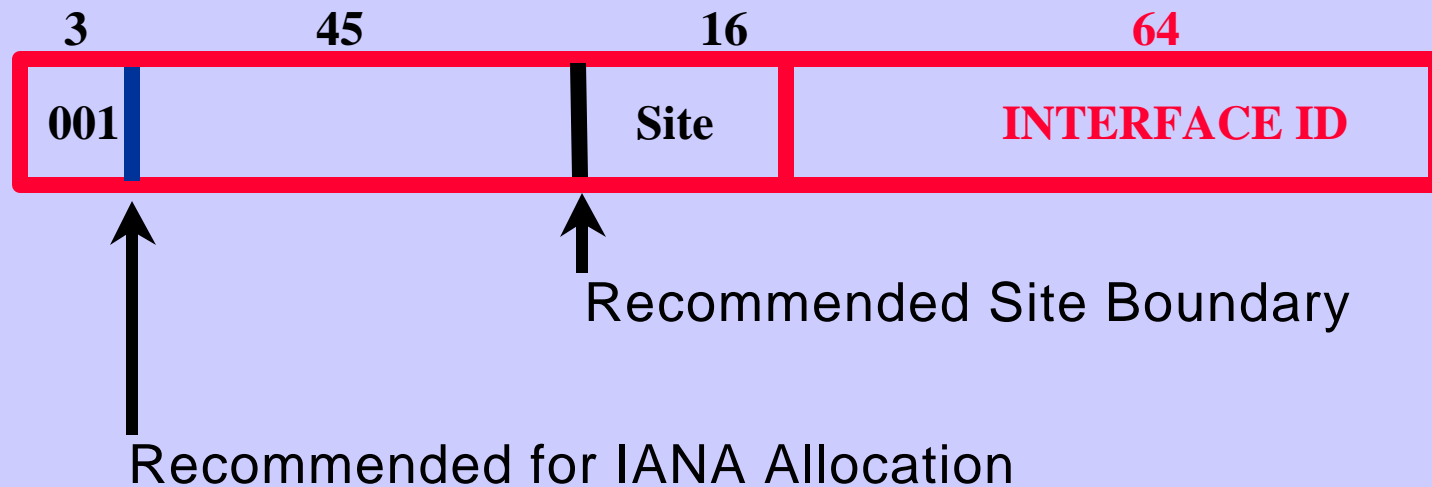
- Form co-operation between RI Rs and IETF
- Separate technology and policy
- Delineate technical issues and come to agreement
- Describe policy issues and start dialogs
- Move policy discussion to RI R constituencies
- RI Rs and IETF move forward co-operatively on documents

Old IPv6 Unicast Address Format



Mixes Technology and Policy

New IPv6 Unicast Address: the Technology and Recommendations



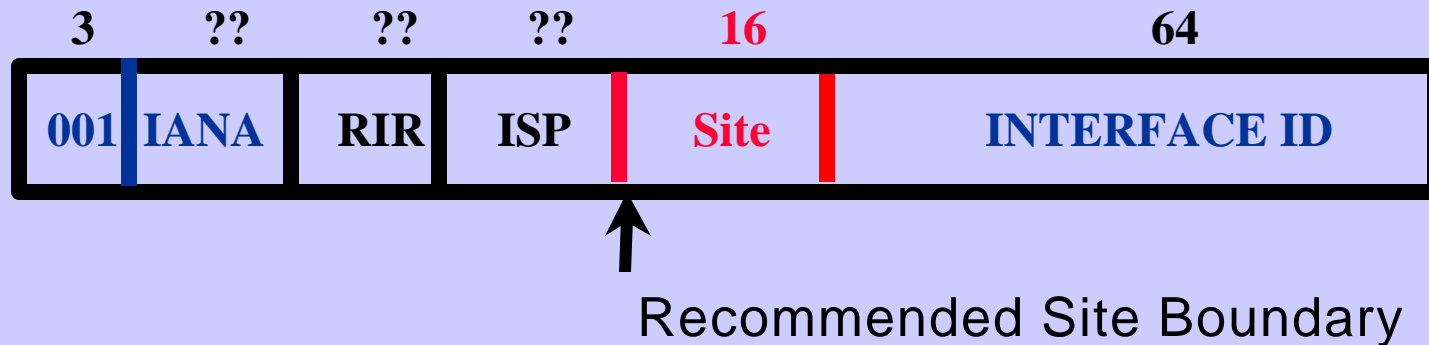
Technology is what can be Hard-Coded in Routers

IPv6 Unicast Address: the Policy Space



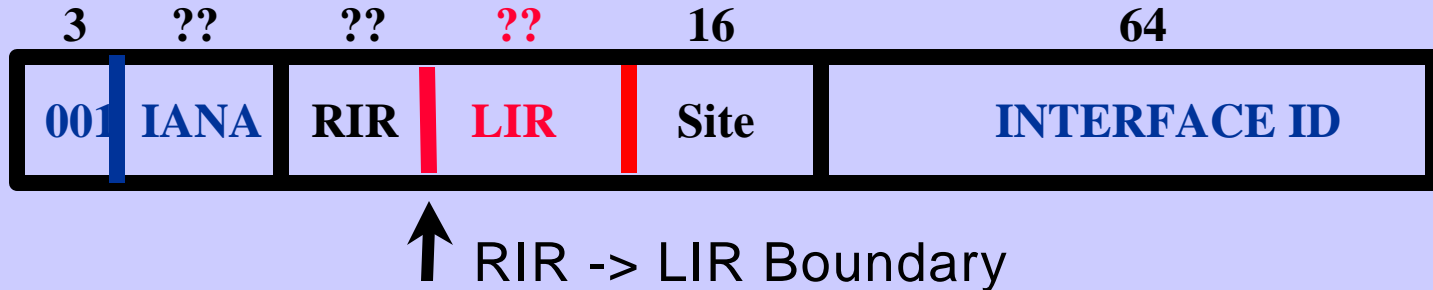
IETF asks IANA to allocate only from 001 for now

I SP to Customer



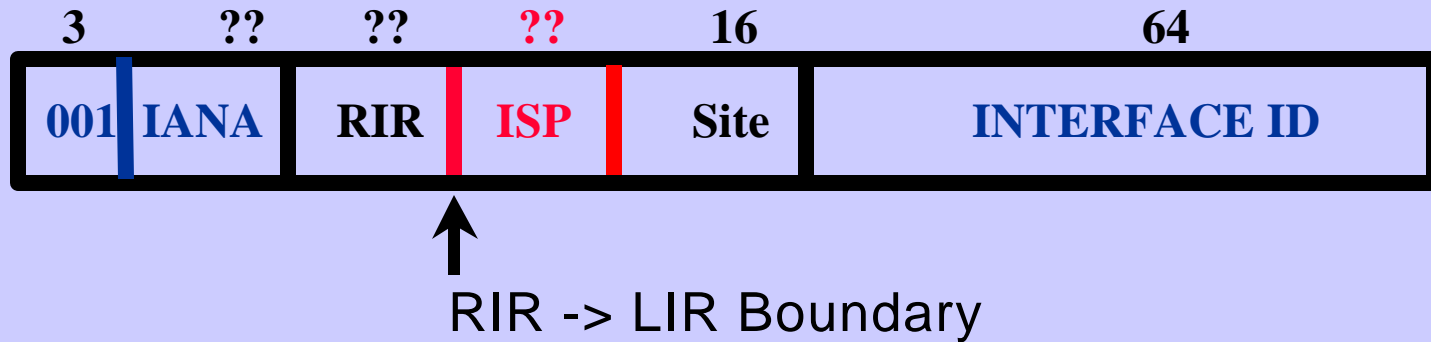
- I AB/I ESG recommended /48
- Use a /128 where it is absolutely known that one and only one device is required
 - e.g dial-up single device (no routing or gating)
- Use a /64 when sure will not be subnetted,
 - e.g. mobile phone given 802.11, bluetooth, etc.

RIR to LIR



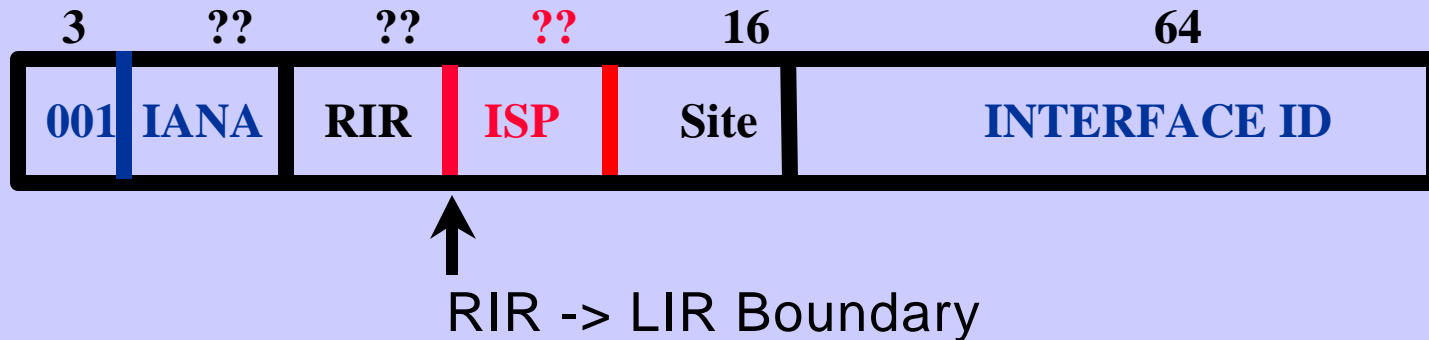
- Based on current practice
 - works well
 - LIRs & RIRs familiar with process
 - never been able to develop definition of *ISP*
- Slow Start method uses real experience
 - minimum initial allocation
 - subsequent allocation based on utilization rate
- Tracking LIR utilization

ISP to ISP



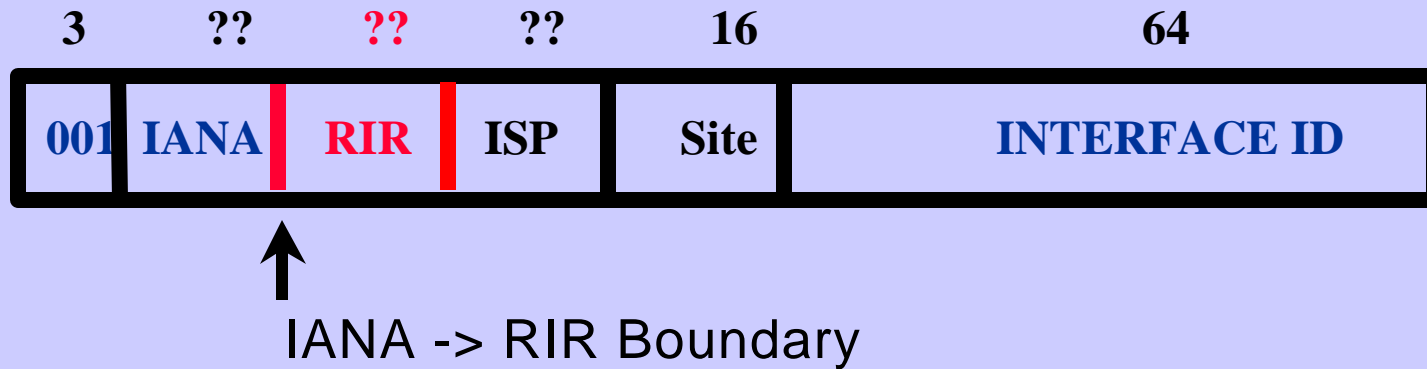
- LIRs need enough space for
 - internal POPs
 - smaller ISPs
- Need for sub-allocations from ISP allocation
 - larger than assignment to a site
 - less than RIR to LIR, but more than LIR to end user

Other I SP to I SP Issues



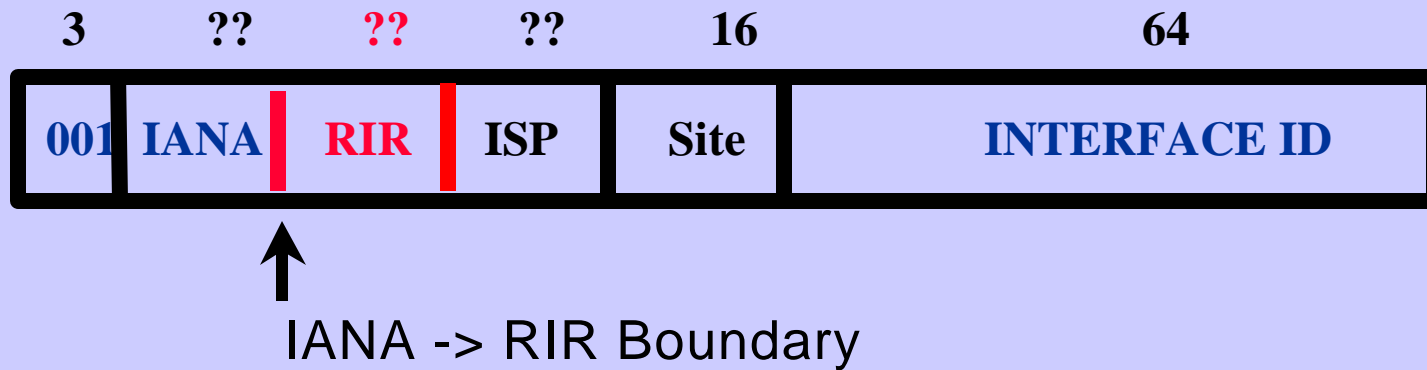
- If IPv4 routing architecture is used, this may influence ISPs' BGP route filters
- And we have no better routing plan yet!
- Help wanted! Participate in IETF multi6 wg and ptomaine BOF (or wg)

IANA to RIR



- IETF asks IANA to allocate only from 001 to RIRs
- Want to 'reserve' majority of the space, 7/8, in case policy scheme needs revision
- IANA -> RIR boundary needs discussion between RIRs and IANA

Other IANA to RIR Issues



How much does IANA allocate to RIRs?

How long should it last the RIRs?

based on utilization rate

determined by ISP/LIR allocation policy

Are there routing implications?

draft-ietf-ipngwg-addr-arch-v3-0x.txt

- In -03, Section 2.5.6 (excerpt from RFC2374) 'described fields and their widths are not a fundamental part of the IPv6 architecture'
- But implementations should not *need* to know
- Ops community and RIRs deal with this, it is policy
- Old-style TLA/NLA/SLA boundaries as example
- In -05 and -06 shown as

n bits	m bits	p bits	128-n-m-p bits	
+-----+-----+-----+-----+-----+				
001	routing prefix	subnet ID	interface ID	
+-----+-----+-----+-----+-----+				

draft-ietf-ipngwg-addr-arch-v3-06.txt

- Only starting with 001 used now
 - IANA consideration, not hard-coded architecture
- All unicast addresses treated the same
 - independent of high bits
- Exceptions: link-local and site-local unicast addresses
- Note that there are non-unicast addresses
 - e.g. multicast
- This was clarified in the -06 draft

RFC2374

An IPv6 Aggregatable Global Unicast Address Format

- No clear consensus about boundaries due to mix of technical and policy considerations
- More operational experience needed
- Consensus on /64 technical for a device
- Recommendation of /48 for a site
 - What is a site? Active discussion on ipngwg list
 - 2374 may be revised in light of these discussions

Next Steps

- IETF community revise **technical** documents
 - addressing architecture (done)
 - unicast technical architecture (unknown?)
- RI R community to develop **policy** documents
 - IANA to RI R
 - RI R to LI R
 - LI R to site (agreement with IETF) (done)
 - common document set of all RI Rs together
- Co-operatively with RI Rs and IETF, so
 - IETF and RI Rs understand each other's issues
 - RI Rs and IETF can support each other