



Welcome to the RIPE NCC IP Request Tutorial

January 27, 2003

RIPE Network Coordination Centre
<training@ripe.net>



Logistics

- Time line : 9:00-10:30, break, 11:00-12:30
- Material
 - <http://www.ripe.net/ripe/meetings/ripe-47/tutorials/ip-request/>
 - Reference Booklet
- Target audience: non-LIRs, new LIR staff
- Objectives
 - how to interact with RIPE NCC
 - present latest policies & procedures
- LIR Training Courses: <http://www.ripe.net/training/lir/>
- Trainers

Overview

- Basic RIPE Database Issues
 - querying DB
 - creating person object
- Setting up an LIR. 1st Allocation
 - terminology
 - setting-up an LIR
 - first allocation
- Assigning PA Address Space
 - communication with hostmasters
 - completing the request form
- Evaluation of Requests
- Registering Address Space
 - managing your allocation
- Assignment Windows
- Sub-allocations
- Reverse Delegation
- PI Request
- AS Numbers

Basic RIPE Database Issues

- Description
- DB query
- Creating contact info objects

More info: <http://www.ripe.net/db/>

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RIPE Whois Database Intro

- Public Network Management Database
- Software
 - RIPE NCC
 - Requirements by RIPE community (DB-WG)
- Data
 - LIRs, End Users, RIPE NCC
 - **Not** responsibility of RIPE NCC

Basic Queries

- **Whois** (client, web interface)
 - `whois -h whois.ripe.net`
 - <http://www.ripe.net/perl/whois>
 - Searches only look-up keys
 - Look-up keys - usually object name

Examples

- **Glimpse** - full text search <http://www.ripe.net/db/whois-free.html>



Creating a **Person** Object

- Only one object per person
- Fill out a template
 - ◆ *whois -t person*
 - *whois -v person* (verbose)
 - ◆ Send to *<auto-dbm@ripe.net>* (“robot”)

OR

[Webupdates](#)

[Demo](#)

Webupdates: <http://www.ripe.net/webupdates>

whois -t person

attributes



person:	[mandatory]	[single]	[lookup key]
address:	[mandatory]	[multiple]	[]
phone:	[mandatory]	[multiple]	[]
fax-no:	[optional]	[multiple]	[]
e-mail:	[optional]	[multiple]	[lookup key]
nic-hdl:	[mandatory]	[single]	[primary/look-up key]
remarks:	[optional]	[multiple]	[]
* notify:	[optional]	[multiple]	[inverse key]
mnt-by:	[optional]	[multiple]	[inverse key]
changed:	[mandatory]	[multiple]	[]
source:	[mandatory]	[single]	[]

nic-hdl

- Unique identifier for **person** and **role** objects
- Format: <initials>[number]-<database>
 - e.g. JFK11-RIPE
 - ◆ Use “AUTO-<number>” placeholders to generate new nic-handle

```
person: Piet Bakker  
nic-hdl: PB1234-RIPE
```

```
role: Technical BlueLight Staff  
...  
nic-hdl: BL112-RIPE
```



Database Robot Responses

<auto-dbm@ripe.net>

- Successful update
- Errors
 - object NOT accepted
- If unclear, send questions to *<ripe-dbm@ripe.net>*
 - include error report and original message
 - ticketised

Questions?



Diag C

***<ripe-dbm@ripe.net> problems with the DB robot (auto-)
<db-help@ripe.net> basic questions (mailing list)***

Setting up an LIR First Allocation

- Terminology
- How to set-up an LIR
- First allocation and assignments

Terminology 1

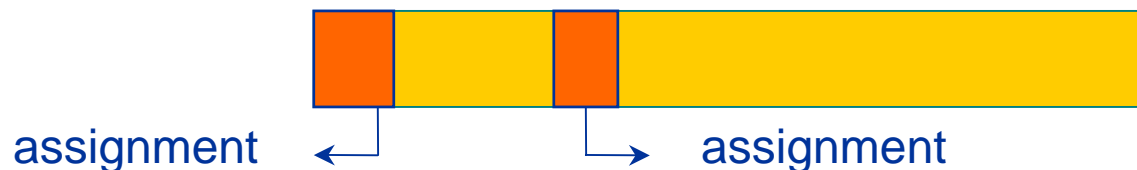
- Allocation

- address space set apart, for LIR's future use
 - LIR+ customers: LIR, Reseller, End User
- **status: ALLOCATED PA**

- Assignment

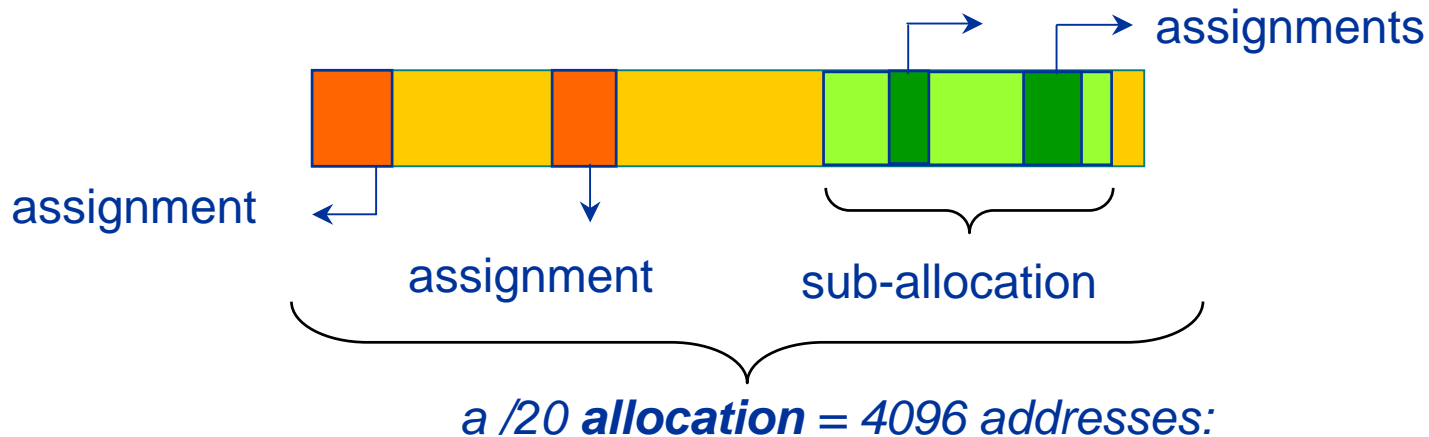
- made from allocation or sub-allocation
- address space **in use** in networks
(End User, Reseller or LIR's infrastructure)
- **status: ASSIGNED PA** (*=Provider Aggregatable*)

/20 allocation = 4096 addresses




Terminology 2

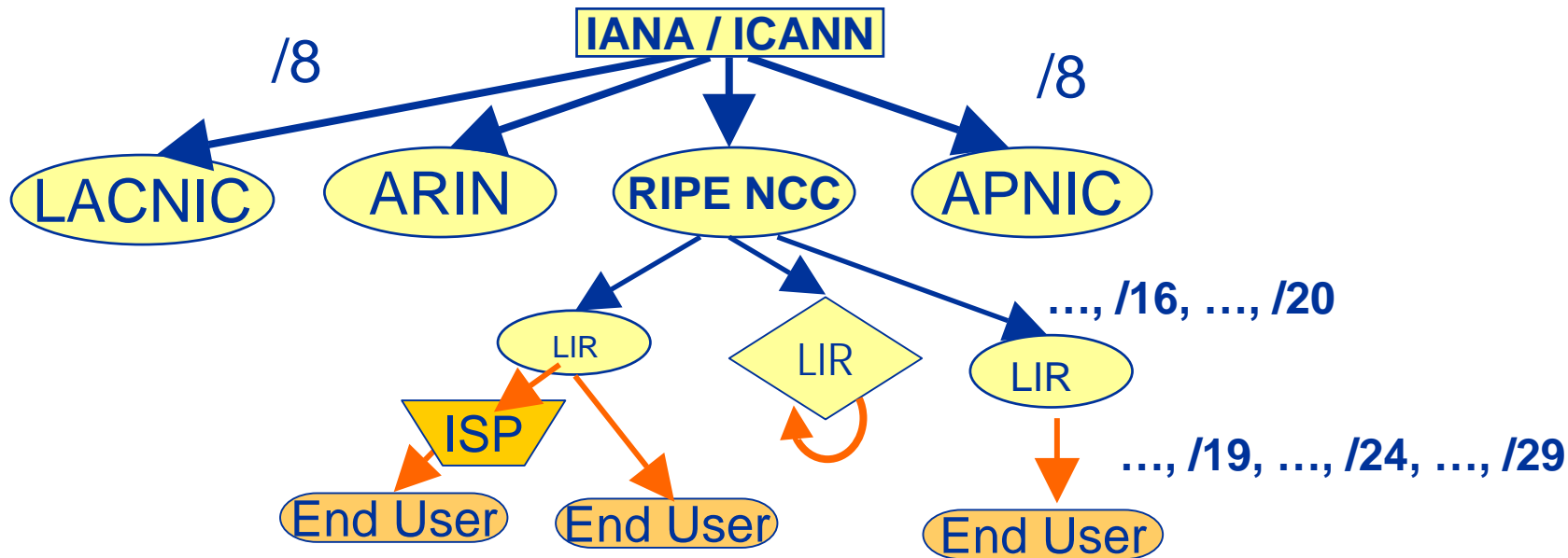
- **Sub-Allocation ***
 - address space from LIR's allocation set apart by LIR for Reseller's future use (Reseller+ End User)
 - **status: SUB-ALLOCATED PA**
- **AW***
 - maximum nr of addresses an LIR can assign without RIPE NCC's approval



Classless Addressing

- Classful: 3 fixed network sizes: A, B, C
- Problem: waste of addresses, routing
- Solution: Classless Inter Domain routing (CIDR) 
flexible allocation / assignment sizes!
hierarchical distribution ◆
- **Always make classless assignments!**
 - “/23 & /25” or /27 etc.... not always /24 !!!

IP Address Distribution



Internet Registry Goals:

AGGREGATION routing!

CONSERVATION no stockpiling!

REGISTRATION uniqueness / troubleshooting



How to Set-up an LIR

- Complete application form & send to [<new-lir@ripe.net>](mailto:new-lir@ripe.net)
 - ◆ provide Reg-ID & contact persons
- Sign contract - “Service agreement”
- Pay the sign-up & yearly fee
 - *billing@ripe.net*

New LIRs get 2 free vouchers for RIPE Meetings

First Allocation

- Steps:
 - complete “PA Assignment Request Form” for assignment (**ripe-283**)
 - send to `<hostmaster@ripe.net>` -- or via **LIR Portal**
 - RIPE NCC evaluates and approves request
 - complete IPv4 First Allocation Request Form (**ripe-272**)
 - send to `<hostmaster@ripe.net>` -- or via **LIR Portal**
- Minimum allocation size /21 (2048 addresses)



After the First Allocation Approval

- `inetnum` objects in the RIPE Database:
 - RIPE NCC hostmaster creates *allocation*
 - * LIR staff creates *assignment(s)*
- Whole allocation can be announced immediately
 - * LIR can create `route` object for the whole allocation
- * `AW=0` -- every subsequent assignment must be approved by the RIPE NCC



Examples of inetnum Objects

```
inetnum: 80.35.64.0 - 80.35.79.255
netname: NL-BLUELIGHT-20000909
descr: Provider Local Registry
...
status: ALLOCATED PA
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: BLUELIGHT-MNT
mnt-routes: BLUELIGHT-MNT
...
```

Mandatory protection by the RIPE-NCC

Mandatory hierarchical authorisation using LIR-MNTNER (hostmaster will create one)

```
inetnum: 80.35.64.0 - 80.35.67.255
netname: BLUELIGHT
descr: Infrastructure
...
status: ASSIGNED PA
mnt-by: BLUELIGHT-MNT
mnt-lower: BLUELIGHT-MNT
mnt-routes: BLUELIGHT-MNT
...
```

Mandatory protection by the LIR-MNTNER

Recommended hierarchical authorisation

Questions?

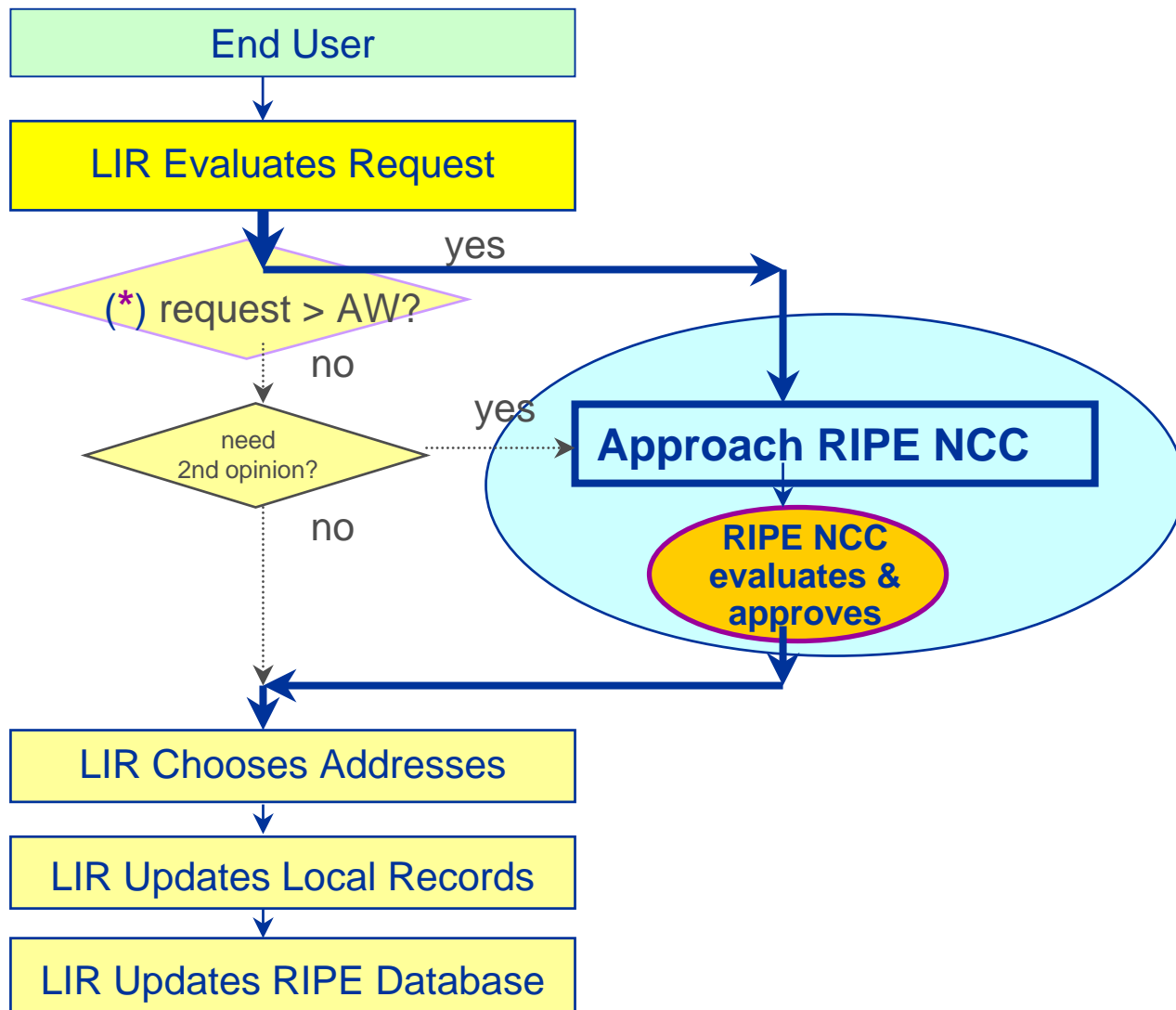


Assigning 'PA' Address Space

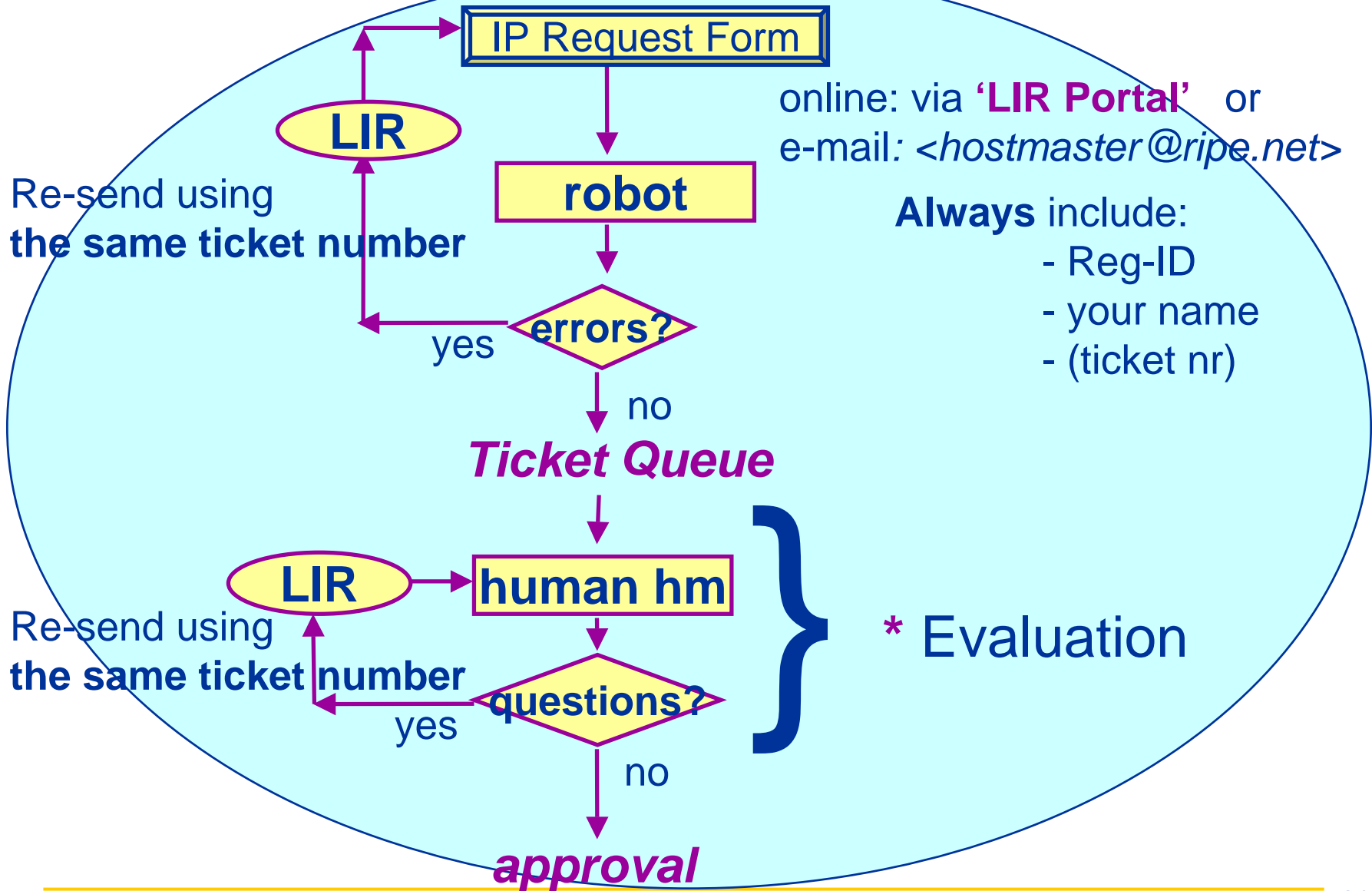
- Assignment Process
 - Terminology
 - Communication with hostmasters
 - Provider Aggregatable (PA) Request form
- LIR Portal



Assignment Process, AW=0



Communication Process




LIR Contact Persons

- 📅 RIPE NCC **internal** “reg” file for each registry
 - confidential
 - only contact persons can
 - send requests
 - change contact info

- To update contact info: ♦ **“LIR Portal”**
 - create `person` objects in RIPE DB
 - **“reg” file not updated from RIPE DB!**

- 📅 Members’ mailing lists
 - `<local-ir@ripe.net>` (lst-localir) ; `<ncc-co@ripe.net>` (lst-contrib)

- Secured web access to private RIPE NCC registry data
 - <https://lirportal.ripe.net/>
- Viewing and editing LIR info and resources:
 - (contact, billing + online payment, IP allocations and assignments, AS, status of tickets)
-  Online Request Forms and “PA Assignment Wizard”
- Activate account
- Create user accounts with different privileges
 - These user accounts are not ‘LIR contact persons’ !
 - create “LIR contact persons” in General Menu (from user account)
- X.509 PKI
- feedback ? mailing list: [<lirportal-feedback@ripe.net>](mailto:lirportal-feedback@ripe.net)

[LIR Portal](#)
[Demo](#)

Ticketing System

- Unique ticket nr **per request**
 - NCC#YYYYMMnnnn
- Include it in every message about the request
 - do not create duplicate tickets!
- Check status on web: open-ncc,open-reg, closed
 - *LIR Portal*

Example

Hostmaster-robot

- Replies with:
 - Acknowledgement,
 - Warnings,
 - Error msg.
- Errors:
 - request **NOT** in 'Ticket Queue'
- Keyword in 'Subject':
 - NOAUTO

When to Send a Request

- * If request size bigger than AW
- Separate request forms for:
 - each End User network
 - LIR's own infrastructure
 - can be in a single request:
 - LIR's own network
 - **blocks of** IPs for server housing and web hosting
 - **blocks of** IPs for connection to End Users



How to Get it Right the First Time

- Before sending:
 - FAQ:
 - <http://www.ripe.net/ripenncc/faq/>
 - Short tips and tricks
 - <http://www.ripe.net/ripenncc/tips/tips.html>
 - IPv4 Address Assignment and Allocation Policies ([ripe-288](#))
 - LIR Training Course Reference Booklet
 - <http://www.ripe.net/training/lir/material/refbook.doc>
- **‘PA Assignment Wizard’ via LIR Portal**
- **Request online via LIR PORTAL** (syntax checked!)
 - <https://lirportal.ripe.net> [DEMO](#)
- **or: PA Assignment Request Form: ([ripe-283](#)):**
 - <http://www.ripe.net/docs/iprequestform.html>



General Information

A Example of the completed form

– For the small ISP Laika, customer of the LIR Bluelight

#[General Information]#

- request-type: pa-ipv4 ← do not change pre-filled fields!
- x-ncc-regid: nl.bluelight

#[Address Space User]#

- organisation-name: Laika
- organisation-location: Amsterdam
- website-if-available: www.laika-dog.nl
- Does the organisation already have address space that can meet the needs of this request? Enter “Yes” or “No”
space-available: No



#[Addressing Plan]#

Real needs

Concrete plans

	Size in CIDR	Imm	1yr	2yr	Purpose
subnet:	/25	/25	/25	/25	dynamic dial-up Amsterdam
subnet:	/25	0	/25	/25	dynamic dial-up Utrecht
subnet:	/26	/27	/27	/27,/28	Amsterdam office LAN
subnet:	/27	0	/28	/27	web/mail/ftp servers Utrecht
subnet:	/27	/28	/28	/27	web/mail/ftp servers A'dam
subnet:	/28	/28	/28	/28	training room LAN Amsterdam
totals:	/24,/25,/28	/25,/26	/24,/26,/28	/24,/25	

Total of the request

cumulative numbers



#[Addressing Plan]#...continued

number of subnets: 6

address space returned:

195.20.42.0 - 195.20.42.127 to UpstreamISP by 20030725

... (here: table from previous slide)

Which netname will be used when registering this network in the RIPE Database?

netname: LAIKA-NET

#[Equipment description]#

equipment-name: Dial-up Server

manufacturer-name: Cyclades

model-number: PR4000

other-data: capacity 32 lines each, 2 x 4 = 8 servers

equipment-name: Hosting Server

manufacturer-name: Dell

model-number: various models

other-data: 23 + 19 servers



#[Network description]#

Amsterdam web hosting and dynamic dial-up:

22 domain hosting clients (ftp+mail)

200 http 1.1 websites on 1 server

4 access servers

Utrecht web hosting and dynamic dial-up:

18 domain hosting clients (ftp+mail)

150 http 1.1 websites on 1 server

4 access servers

#[Network diagram]#

Please enter “Yes” or “No” if you have attached a network diagram in JPEG or Postscript format.

diagram-attached: No

Questions?





Evaluation of Request



Evaluation -- Address Space User

- Does the organisation already have address space that can meet the needs for this request?
Yes/No?
 - From other LIRs?
 - Query the RIPE DB
 - use “Glimpse”
 - Ask your customer



Evaluation -- Addressing Plan

- ◆ Returning addresses?
- Subnet purpose description
- All subnets classless?
 - network can be several CIDR blocks
- Utilisation:
25% immediately, 50% in one year
- Time frame:
 - other forecast periods can be used

Evaluation Policies

- Policy document: **ripe-288**
 - dynamic dial-up! not static
 - name-based virtual web hosting! not IP-based
 - exceptions (SSL, ftp&mail servers..)
 - special verification methods for more than /20:
also for xDSL, cable, GPRS...
 - *<http://www.ripe.net/rs/ipv4-verification.html>*
 - DHCP recommended

Renumbering Request

- Customer changing providers
 - returning PA space to old LIR
 - replacing PI space with PA

- in Addressing Plan fill out:

`address-space-returned: 195.42.0.0/25 to ISP-A 20030923`



“return” lines in reg file

Possible Additional Information

- Pointer to web site

- company
- unusual hw / sw

- ◆ Deployment plan

- receipts

- 📅 Network diagram

- Fax or mail info (+3120-5354445)

- handled confidentially

- **include ticket nr, reg-id, hostmaster's name**

Sample Deployment Plan

- When big expansion is planned
- Must match addressing plan

	size in CIDR	Imm.	1yr	2yr	purpose
subnet:	/21	0	/22	/21	London pop
subnet:	/21	0	/22	/21	Berlin pop
subnet:	/21	0	/22	/21	Moscow pop
subnet:	/21	0	/22	/21	Paris pop

Planned operational Date	Date Equipment ordered	Type of Equipment	Number of hosts	Location
02/2004	08/2003	modems	2040	London
05/2004	11/2003	modems	2040	Berlin
06/2004	11/2003	modems	2040	Paris
09/2004	-----	modems	2040	Moscow

Approval

- Approval message sent to LIR
 - size
 - (e.g. 400 IPs = /24, /25 & /28)
 - netname
 - date
 - ticket closed
 - LIRs archives approval message
 - plus all original documents
- ➔ next step: Registration in DB

Questions?



Registering Address Space in the RIPE Database

- How to create network object
- Managing LIR's allocation

Why Register?

- Last and important step in the assignmen process
 - contact info
 - overview
 - uniqueness
- Address space considered in use only if registered in RIPE DB
 - * or else delays in : new allocation, reverse del, AW raise, audit...
- Responsibility of the LIR

Creating Network (inetnum) Objects

- via “**Webupdates**” [\(Demo\)](#)
 - or via email interface: **<auto-dbm@ripe.net>**
 - send completed “network template” (`whois -t inetnum`)
 - **with the (only) keyword NEW in ‘subject’**
 - to avoid over-writing existing objects
 - or done automatically if using “**PA Assignment Wizard**” (LIR Portal)
-
- ➔ ‘`inetnum`’ value in ‘dash’ or ‘slash’ notation!
 - e.g. **80.35.64.32 - 80.35.64.63** or **80.35.64.32/27**
 - ➔ Keep netname as approved in request
 - ➔ Has to pass hierarchical authentication





Valid Assignments (Summary)

- Larger than AW:
 - Approved, and registered in RIPE DB
 - one or more objects
 - correct date
 - size and netname as approved
- * Within AW:
 - Registered in the RIPE DB
 - netname pointing to End User
 - * or **remarks: INFRA-AW**
- “Assignment is only valid as long as original criteria remain valid” (**ripe-288**)

Questions?





Assignment Windows and How to Get One





Assignment Window: Definition for End Users

- Maximum number of IP addresses the LIR can assign without **prior** approval of RIPE NCC
- AW is per LIR
 - ◆ AW is per 12 months per each End User
 - ◆ AW is 0 initially, then raised gradually

 policy set by address-policy-wg

Initially: $AW=0$

- Send
EVERY End User's request 
and
EVERY request for LIR's infrastructure
to the RIPE NCC
- Separate request forms 
– for each End User network
- Do not send more than ~ 5 requests at once

When Is the AW Raised ?

- Correct requests
- Policies applied
- Valid DB objects 
- AW = average size of requests
- Approach RIPE NCC: *<lir-help@ripe.net>*
 - if AW not raised



When Is the AW Lowered ?

- New LIR staff need training
- Negative auditing report



 Find out the AW size:

- *asm-window* line(s) in the “reg” file
- LIR Portal [\(Demo\)](#)

Assignments = or < AW

LIRs' Responsibilities :

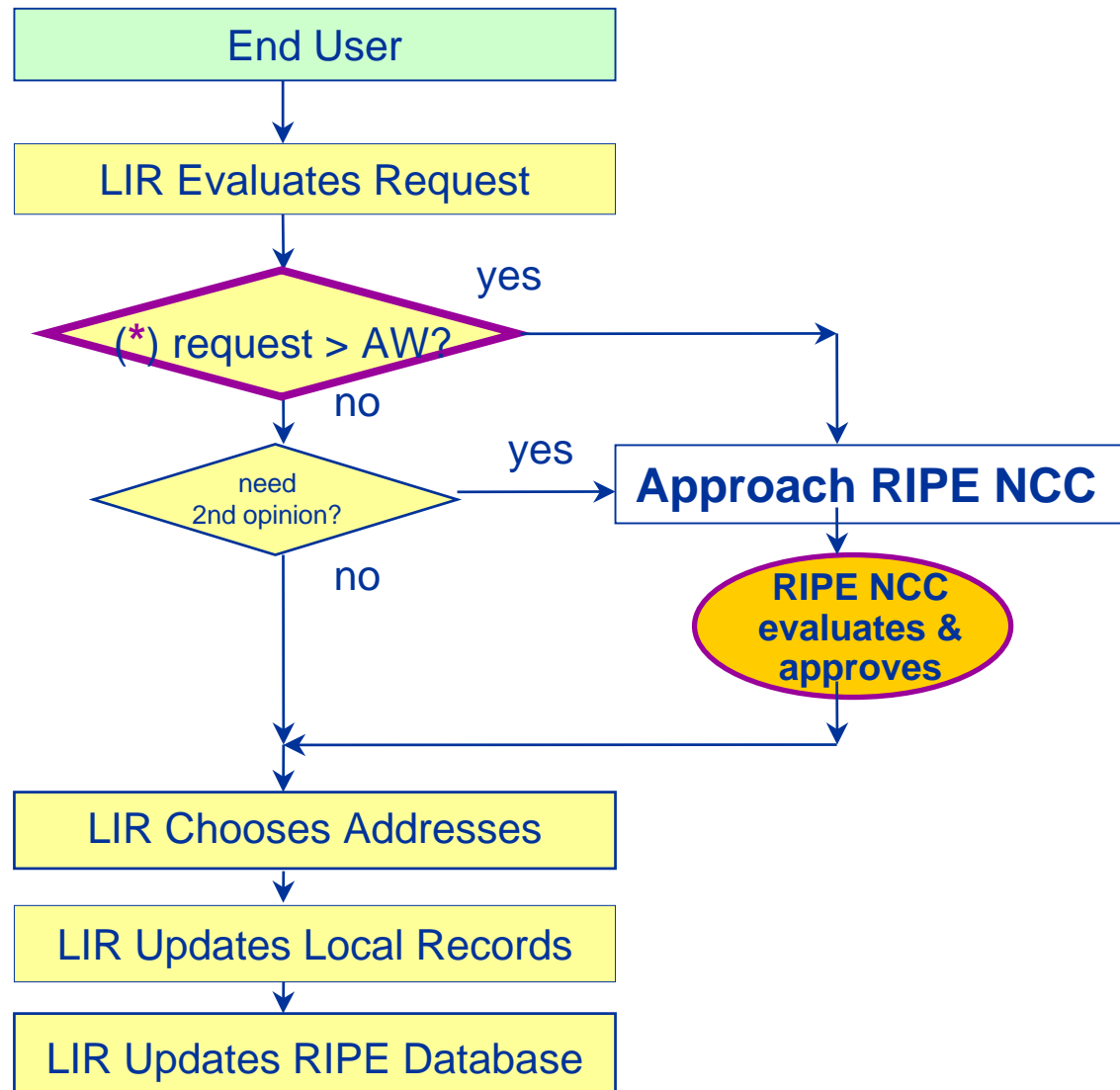
Evaluate all requests

- Keep documentation for all assignments
 - RIPE NCC may ask for it later
- Register all assigned networks in RIPE DB
 - choose **netname** 
- Remind customer's previous ISP after renumbering
 - to delete old DB objects 



Assignment Process for an End User

(*) Total size of this request plus all previous assignments of this End User within the last 12 months, that haven't been requested from the RIPE NCC



Questions?



[<lir-help@ripe.net>](mailto:lir-help@ripe.net), [LIR Portal](#)

Sub-allocations

- Sub-allocations
- Assignments in Sub-allocations
- Resellers and End-Users

Sub-allocation



- From LIR to Reseller
 - only if LIR has AW !
 - no approval needed
- Up to 400% of LIR's AW
 - for each customer within any 12 months
- Minimum size: /24
 - sub-allocation only possible if $AW \geq /26$
- Maximum size: /20 (even if $AW > 22!$)

Registering Sub-allocations



- LIR must register it in RIPE DB
 - LIR has final responsibility for whole sub-allocation
- **inetnum** object:
 - “**status: SUB-ALLOCATED PA**”
 - use Reseller’s mntner in **mnt-lower** *
- Considered as ‘addresses in use’
 - new allocation

Assignments from Sub-allocations



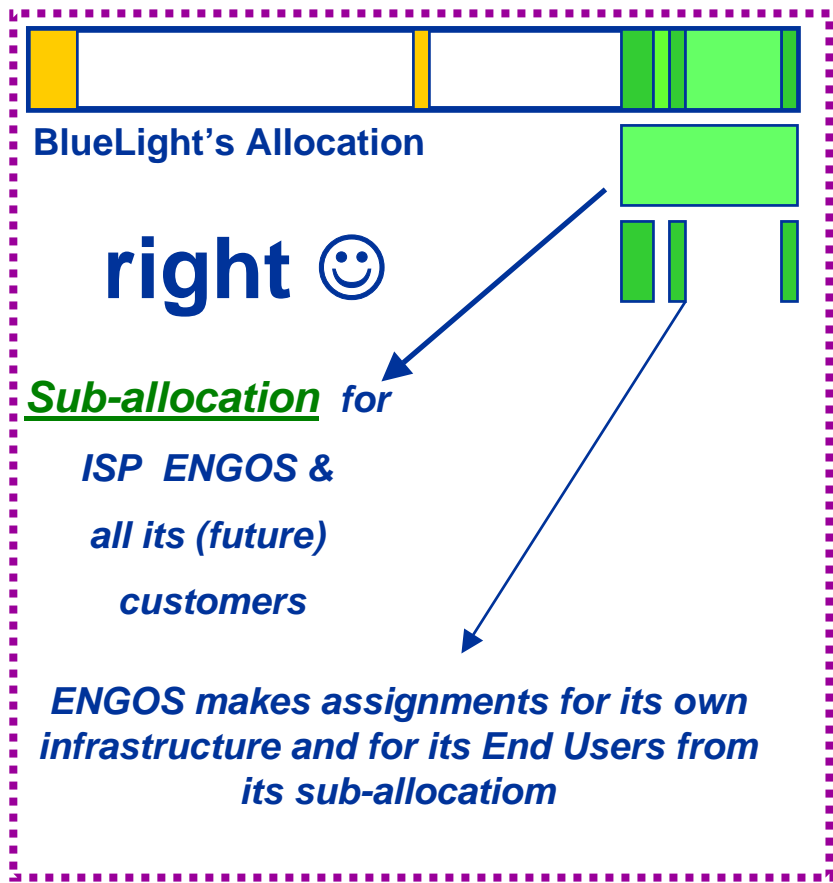
- From Reseller to itself or to End User
- Size of assignments:
 - AW rules also apply within sub-allocations
 - Reseller can use “INFRA-AW” rule for own infrastructure
- Assignments must be registered in the RIPE DB:
 - “**status:ASSIGNED PA**”
 - netname pointing to End User
- RIPE NCC may ask for documentation later

- LIR can **sub-allocate** address space to a Reseller
- Reseller can **assign** address space to End User

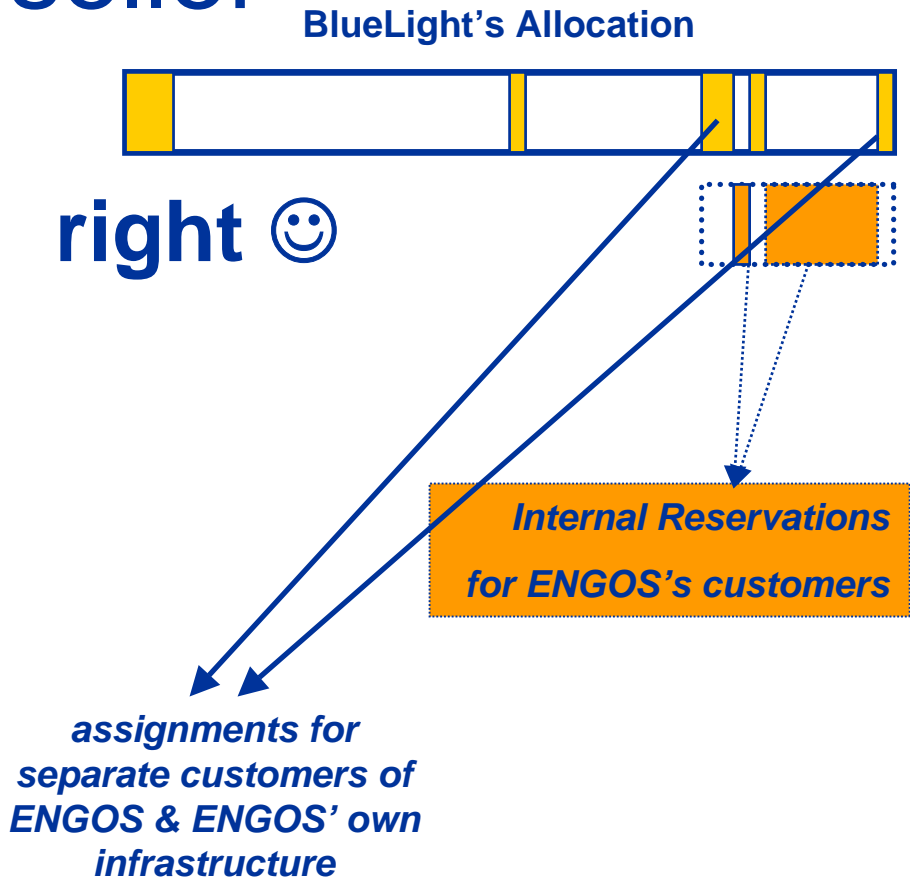
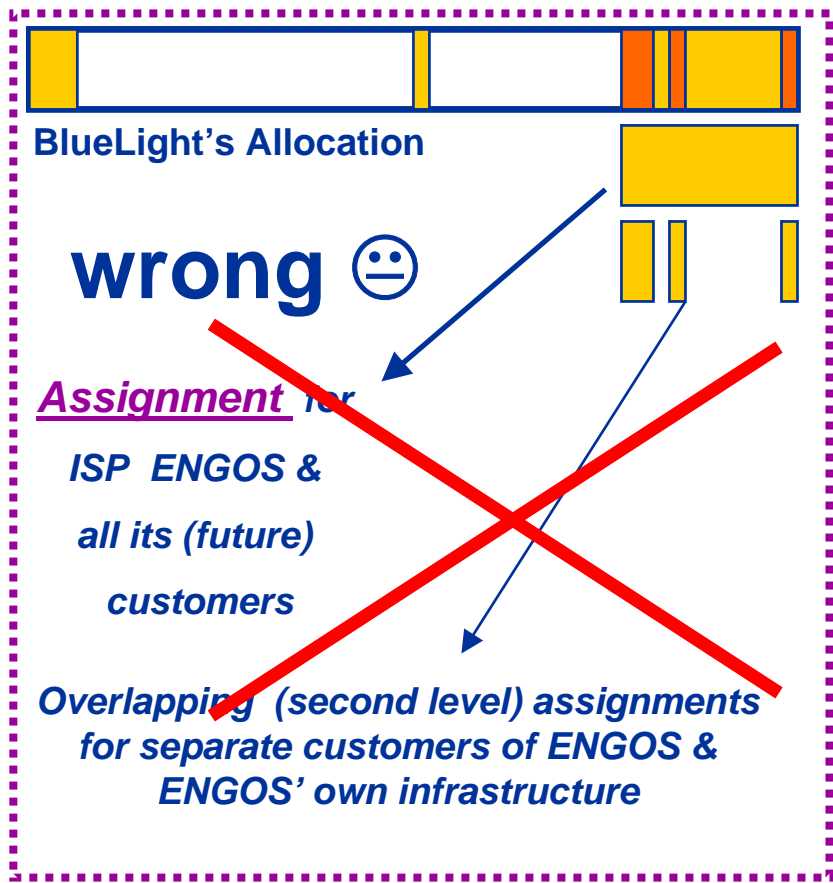
- **...but if no sub-allocation** made:
 - LIR makes separate assignments to
 - Reseller's infrastructure
 - End User
 - Separate assignments must be
 - requested (if above AW)
 - registered in the RIPE DB



Using Sub-allocation for a Reseller




If Not Using Sub-allocation for a Reseller



Overlapping = two inetnum objects with the **status: ASSIGNED PA** *partially* covering the same range



How to Manage Your Allocation

- Aggregate
- Use sub-allocations 
- Make **sensible** internal “reservations”
 - good: space for **some** customers to grow
 - bad: fragments allocation

Questions?



Reverse Delegation Procedures

We assume you already understand DNS

The Course Reference Booklet has extra
configuration examples for this section



Why Do You Need Reverse DNS Delegation ?

- All host-IP mappings in the DNS (A record) **should** have a corresponding IP-host mapping (PTR record)
- Otherwise
 - users blocked from various services (ftp, mail, IRC)
 - troubleshooting more difficult (**traceroute**)
 - more useless network traffic
- Removed if bills not paid! email: *<billing@ripe.net>*



Request Procedure

Who Can Request and When?

- Reverse delegation requests must come from LIRs and **not** End Users
- /16 zones can be delegated to the LIR immediately after allocation
- /24 zones are delegated
 - to LIR or End User as the address space is used as valid assignments

Request the Delegation

- Send **domain** template to “Marvin”,
<auto-inaddr@ripe.net>
 - **always include reg-ID**
- ◆ Marvin performs checks (see next slide)
- After making ‘*checks*’, “Marvin” enters NS lines into the parent zone file and sends an acknowledgement.



What Does “Marvin” Check?

- *Checks* if the nameserver setup is correct
(RFC1912)
- *Checks* that the address space is either:
 - a valid assignment (in each /24 zone)
 - a valid /16 (or shorter prefix) allocation
- Creates the domain object in the database
(DB Syntax checked)

Example domain Object

whois -t domain

domain: 142.35.80.in-addr.arpa
descr: Reverse delegation for Bluelight's Customers
Splitblock
admin-c: JJ231-RIPE
tech-c: JAJA1-RIPE
zone-c: WF2121-RIPE
nserver: ns.bluelight.nl
nserver: ns2.example.nl
mnt-by: BLUELIGHT-MNT
changed: jan@bluelight.nl
source: RIPE

no DOT at the end

names instead of IP addresses

Notice: DB SW will add date!

Problems with **inaddr** Robot?

- Diagnostics are sent to the requester
 - 20 warning points are considered an error
 - correct errors and re-send to **<auto-inaddr@ripe.net>**
- Full documentation :
 - *<http://www.ripe.net/reverse/>*
- If problems continue, contact
 - **<inaddr@ripe.net>** for ***DNS technical questions.***
include **full** error report + inaddr ticket nr
 - **<hostmaster@ripe.net>** for ***assignment validity*** issues.
include **full** error report + ***assignment*** ticket nr

Updating the Delegation

- **Modifying the DNS:** change the **nserver** lines in the **domain** object and send it to “Marvin”.
- **Deleting a delegation:** send the **domain** object with the extra attribute to Marvin:
`delete: <reason, email addr>`
- **For modifying contact details:** send updated **domain** objects to “Marvin”
- **In all cases: Must pass authentication**



Reverse Delegation of /16 Allocation

- Requirements and procedures the same as /24, except
 - *ns.ripe.net* is a **mandatory** secondary nameserver
- We suggest you add your maintainer as a mnt-lower on the domain object
- LIRs should continue to check sub-zone setup before delegating /24s
 - **web check** or send to `<auto-inaddr@ripe.net>` with Subject: TEST



Multiple /24 Delegations

- Up to 128 reverse **domain** objects can be sent in one e-mail, even if not consecutive
- Shorthand notation for consecutive zones:
eg: 10-15.35.80.in-addr.arpa
- Each domain object must be signed separately if **auth: PGP-KEY** in the mntner

< /24 Delegations

Reverse delegation also possible for a /24 shared by several customers

- not a reason for classful assignments

- RIPE NCC delegates the whole /24 to the LIR
- Customers can run own primary nameserver if
 - LIR delegates parts as address space gets assigned
 - use CNAME to direct to extra domain

(RFC 2317) 

Questions?





PI Request



PA vs. PI Assignments

- **Provider Aggregatable**
 - End User addresses out of LIR's allocation
 - must be returned when changing providers

- **Provider Independent**
 - End User addresses directly from RIPE NCC
 - can be kept when changing providers

- **Make contracts (ripe-127)**
 - only way to distinguish PA and PI space



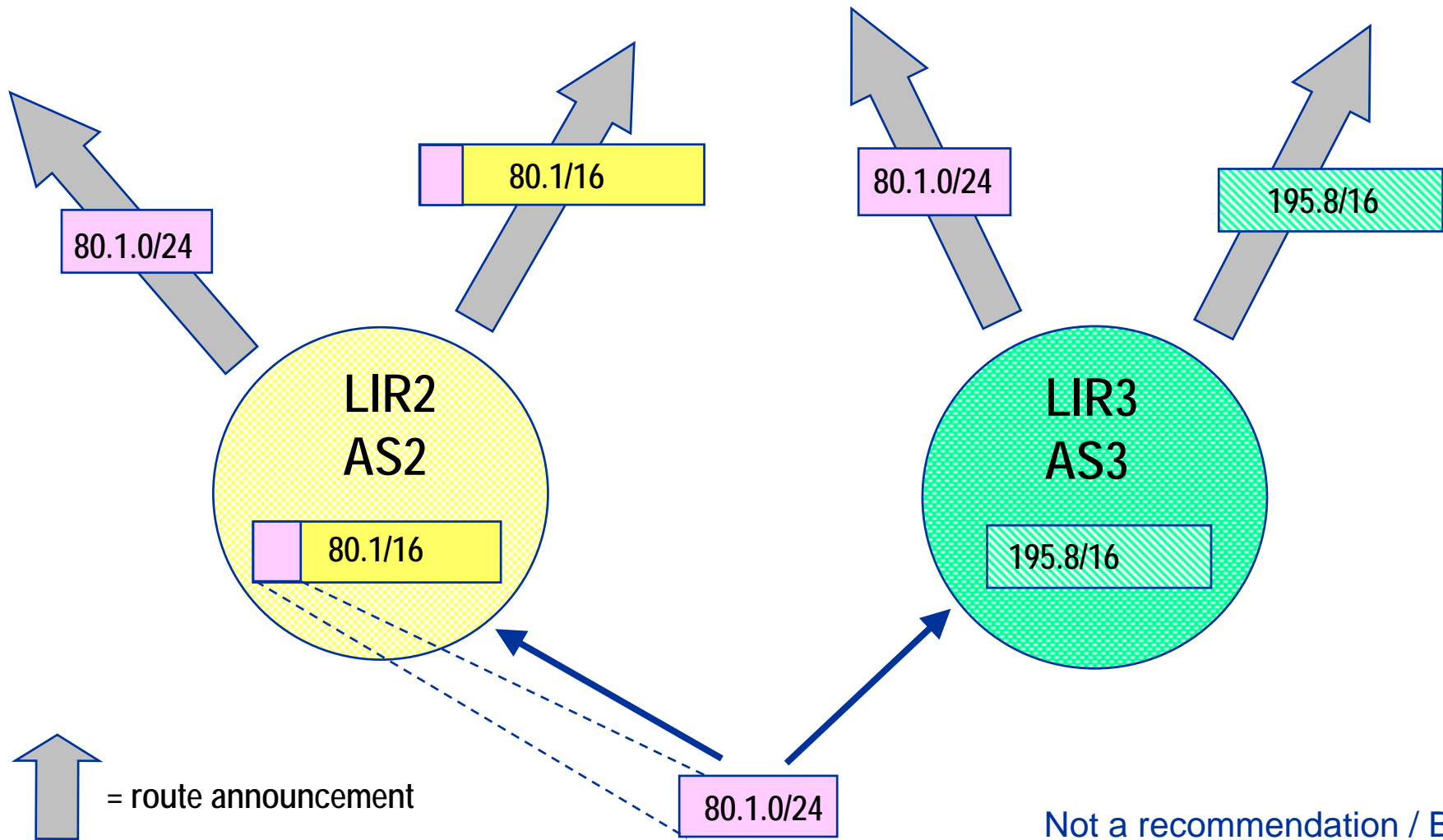
Reasons for Requesting PI

- ◆ Multihoming
- Independence
 - e.g. IXP, ccTLD
- Needing unique / portable address space
 - but not the whole allocation
 - not distributing addresses to End Users
- Changing providers often
- Routing part of the network separately

3 Ways of Multihoming

- LIR (PA allocation & ASN)
- PI addresses (PI assignment & ASN)
 - ☹ ISPs may filter on “minimum allocation size” (**ripe-269**)
 - ☹ next assignment not aggregatable
 - ☹ wasting ASN; larger routing table
- ◆ Multihoming with PA assignments, without ASN
 - ☺ future aggregation
 - ☹ overlapping prefixes may be filtered out
 - ☹ renumbering

Multihoming with PA Addresses





Requesting PI Space

- LIR sends request on behalf of customer
- Request online via **LIR PORTAL**
 - *<https://lirportal.ripe.net>*
- or: Complete 'PI Assignment Request Form' (**ripe-285**)
 - *<http://www.ripe.net/ripe/docs/pi-requestform.html>*

Requesting PI Space

- Differences from “PA Request Form”:
 - in **#[Initial Information]#** template answer additional questions:
 - why does customer want PI (and not PA)?
 - requesting extra address space for routing or administrative reasons?
 - aware of consequences?
 - In **#[Database Templates]#**
 - fill out **inetnum** template ◆



Evaluation of PI Requests

- PI discouraged by the RIPE community!
 - LIRs should convince End Users to use PA
 - LIR explains consequences to End User, in contract (example: **ripe-127**)
- Same criteria as PA
 - conservative estimates
 - classless
- Assignment is only valid as long as original criteria remain valid (**ripe-288**)



After the PI Assignment Approval

- RIPE NCC will
 - assign a PI block
 - create assignment object in RIPE DB
- LIR / End User must not (sub)assign further
- LIR assists End User with reverse DNS delegation, route object, mntner
- If End User changes provider
 - old LIR adds new ISP's **mntner**
 - and removes own **mntner**

Questions?



LIR Portal Only for resources requested by/through your LIR.

Autonomous System Numbers and the Routing Registry

- It is assumed that attendee is familiar with BGP routing, and has interest in obtaining public ASN

Autonomous System

- Definition:
 - “One or more connected networks (...) with a SINGLE and CLEARLY DEFINED routing policy” (RFC-1930)
 - every AS: unique AS number
- IANA allocates AS numbers to RIRs
- RIR assigns AS number
 - to LIR or to End User (via LIR)
- ◆ AS number and route object registered in Routing Registry (part of RIPE DB)

How to Get an AS Number ?

- Request online via **LIR PORTAL**

- name of organisation

either
or

- address prefix to be announced with this requested AS#
- ticket nr of pending assignment request (if applicable)
- peering contacts' e-mails
- **aut-num** object template
- **mntner** object template
- your name

- or: Complete ASN request form: **ripe-278**

- <http://www.ripe.net/ripe/docs/asnrequestform.html>

- Send to `<hostmaster@ripe.net>`



Criteria for Evaluation of ASN Requests

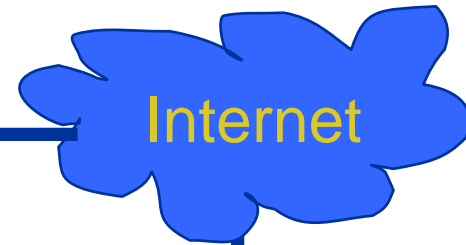
- **Mandatory:** multihomed and unique routing policy
 - e-mail addresses of peers
- Feasible to peer with specified ASNs?
- Can private ASN be used ?

AS Number Policies (**ripe-263**)

RPSL

- “Routing Policy Specification Language” (RFC 2622)
- “Using RPSL in Practice” (RFC 2650)
- All BGP parameters can be described in RPSL
- `import`, `export`,
“`action`” can be: `pref=<value>` or other parameters
 - smaller “`pref`” = more preferred route

AS Example



aut-num: AS3

export: to NEW announce ANY
import: from NEW action pref=120;
accept NEW

aut-num: NEW

export: to AS2 announce NEW
import: from AS3 action pref=100;
accept ANY
import: from AS2 action pref=20;
accept AS2
export: to AS3 announce NEW

import: from AS2 action pref=200;
accept ANY

aut-num: AS2
import: from NEW action pref=200;
accept NEW
export: to NEW announce ANY



Registration in RIPE Database

- RIPE NCC hostmaster
 - creates **aut-num** object
 - informs requester
- User keeps up to date:
 - routing policy (**aut-num**, **route** objects)
 - contact info (**person/role**, **mntner**)
- * User creates route object



aut-num Object

aut-num: AS42

as-name: BLUELIGHT

descr: Bluelight AS#

import: from AS2 action pref=20; accept AS2

import: from AS3 action pref=100; accept ANY

import: from AS2 action pref=200; accept ANY

export: to AS2 announce AS42

export: to AS3 announce AS42

admin-c: JJ231-RIPE

tech-c: JAJA1-RIPE

mnt-by: BLUELIGHT-MNT

mnt-routes: BLUELIGHT-MNT

changed: hostmaster@ripe.net 20011010

source: RIPE

The “route” Object

route: 80.35.64.0/20
descr: BLUELIGHT-NET
origin: AS42
mnt-by: BLUELIGHT-MNT
mnt-routes: BLUELIGHT-OTHER-MNT
changed: hostmaster@bluelight.com
source: RIPE

- ‘route:’ *and* ‘origin:’ primary key
- LIR creates route object(s)
- ◆ **mnt-routes** for hierarchical authorisation



Creating “route” Object

📅 Pass multiple authentications

Add appropriate mntner in mnt-routes of allocation object via [LIR Portal](#)

1. **mntner** in the **mnt-routes** of the **originating ASN**

- if not there, then **mnt-lower**, then **mnt-by**

AND

2. **mntner** in the **mnt-routes** of the **address space**

- if not there, then **mnt-by**

AND

3. **mntner** referenced in the **route object itself**



Internet Routing Registry

- Globally distributed DB with routing policy information
- Tools: <http://www.ripe.net/db/irrtoolset/>
 - traceroute with info of traversed ASes (prtraceroute)
 - create **aut-num** based on router conf (aoe)
 - configure router based on IRR (rtconfig)
 - list routes registered by the specified AS (roe)
- Routing Registry Consistency Check (RRCC)
- RIPE Routing Registry
 - subset
 - “-a” flag to query all mirrored Routing Registries

Routing Registry course: <http://www.ripe.net/training/rr/>

Questions?



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