LISP Transition Mechanisms

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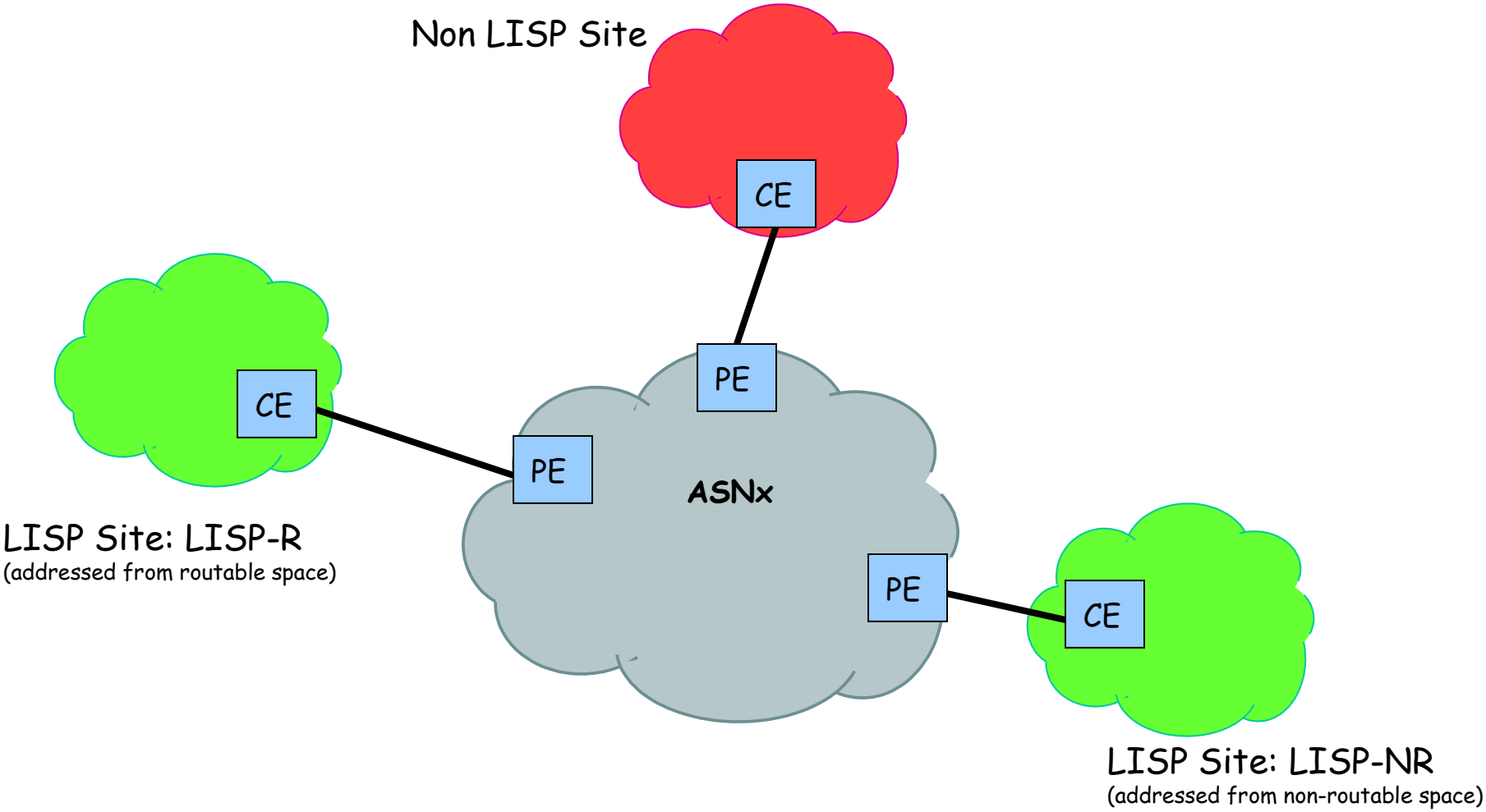
Introduction

- General Thoughts
  - Share the goals of LISP
  - No magic bullet
- Core requirements
  - Incremental deployment
  - Minimize pain/cost
  - Independent of which mapping system chosen (?)

Three Transition Mechanisms

- #1 Routable EIDs
  - Not much time spent on this
  - Having everything in both mapping systems seems non optimal
- #2 Proxy Tunnel Routers (PTRs)
  - Can work nicely if we use a separate sub namespace for the new 'PI EIDs'
- #3 Source NAT
  - Has all the classic problems of NAT

Reference Transition Topology



Routable EIDs

- EIDs published in both the existing BGP DFZ *and* the LISP mapping database
  - Essentially there are no sites that are 'LISP-NR'
- EIDs can only be withdrawn from a table after transition is 'completed'
- This mechanism may provide a good way to get started and gather data

Proxy Tunnel Routers (PTRs)

- PTRs Originate the new EID sub-namespace
  - Sub-namespace: A chunk of PA locator space set aside for EID transition
  - Some advantages if this space aggregated
    - Something like 240/4 for example ☺
    - <Insert your own address aggregate here>
- Packets from non LISP sites trying to reach LISP-NR sites are routed to these PTRs
  - The PTR has the mapping information of the destination ETR
  - The return path does NOT go back through the PTR – the default is asymmetric

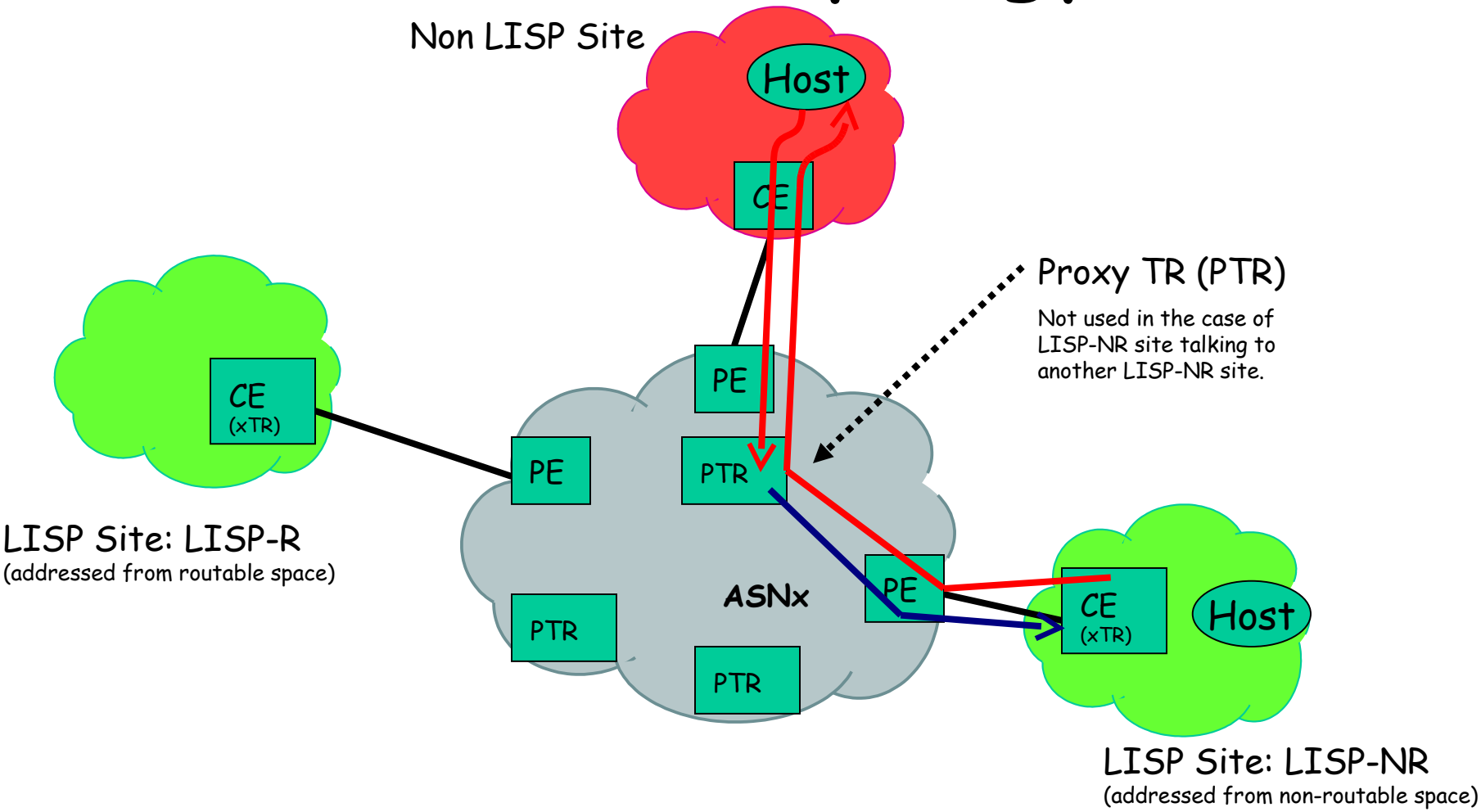
Scaling PTRs

- PTRs sink traffic to them by announcing EID namespace
  - can announce the entire EID sub-namespace or more specific pieces of the sub-namespace
  - PTRs need to be robust and scale well
  - Puts onus on a SP to manage/pay for transition
- Performance considerations
  - Stretch
  - State
  - Asymmetry

Packet Flow with PTRs

- A packet flow from non LISP site to LISP-NR site:
  - Host looks up EID for dest – gets 240.1.1.1
  - CE default routes to its PE (240/4 not in table)
  - PE has route to 240/4 next hop is the PTR
  - PTR has mapping information and LISP encaps
  - Return path is asymmetrical
- Packet Flow from non lisp site to lisp-r site
  - Since destination is routable PTR not used

Transition Topology: PTR



Further Thoughts on PTRs

- Need to figure out how forwarding features like uRPF work in this model
- How best to control route announcements
- Better understand security
- .....

Source NAT

- Source NAT hides the NR space from non-lisp sites
- Each xTR can have the ability to NAT before encap
- Should support both 1:1 NAT, and P-NAT
  - 1:1 NAT will require more than one /32 of PA space assigned to that site
  - Multi-homing should still work
  - Ingress will have to be statically mapped (just like NAT today)

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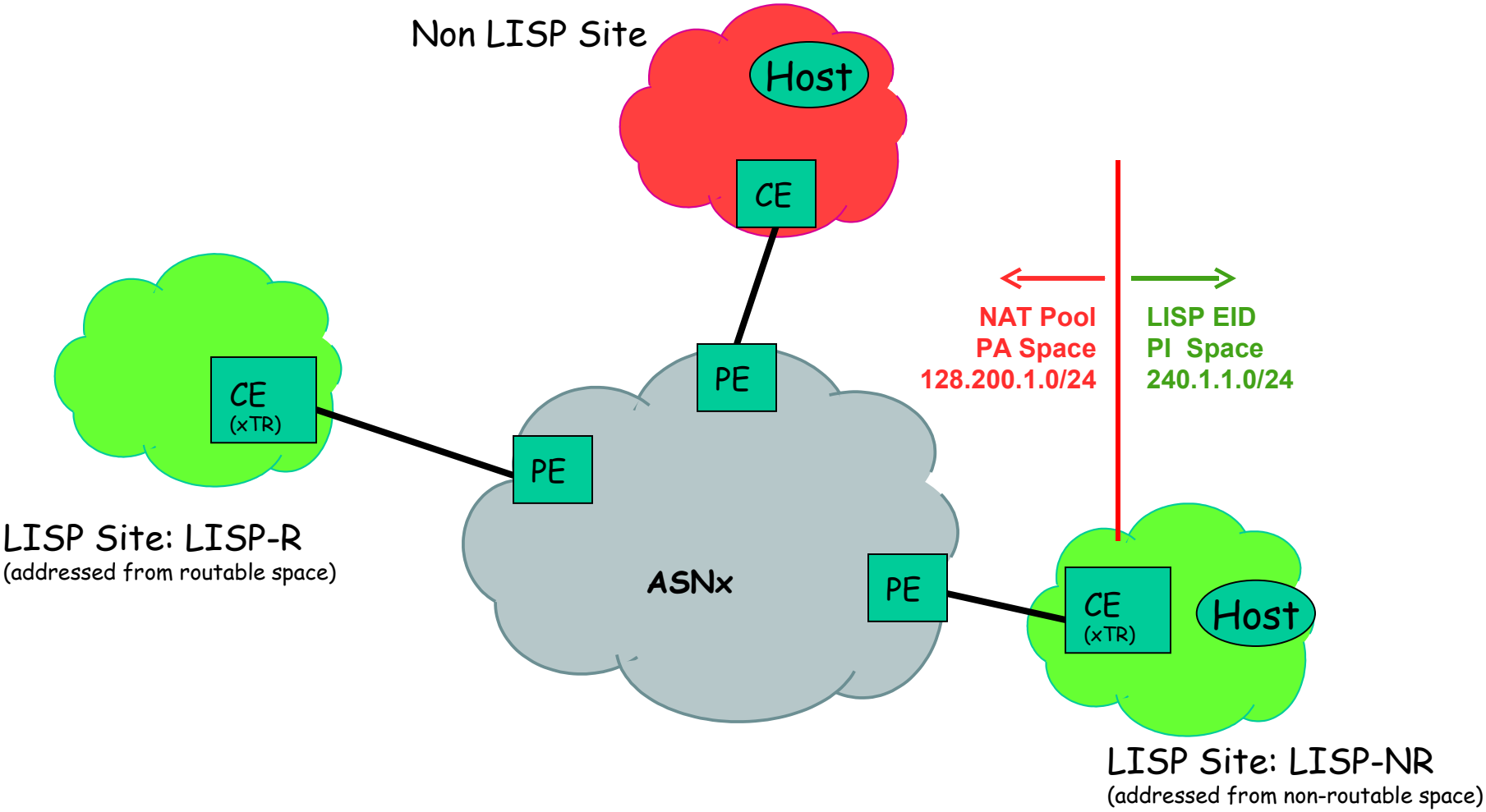
Source NAT Steps

- Site has PA 128.200.1.0/24 assigned to it
  - 128.200.1.1 will be used as the R-Loc site
  - The rest of the /24 will be used for 1:1 NATs
- The PI EID space for the site is 240.1.1.0/24
  - Just an example, can be any non-routed address

Source NAT Steps (cont)

- The ITR then performs a NAT function on the outgoing packet of say 240.1.1.2 to 128.200.1.2 when talking to a non-lisp site…
  - Ingress connections must use 128.200.1.2 as the public EID for this host (classic NAT ugliness)
- When 240.1.1.2 wants to talk to a LISP site, the EID is maintained, and the source rloc of 128.200.1.1 is used
  - Ingress connections to 128.200.1.1 are always LISP packets

Transition Topology: Source NAT



Further Thoughts on NATs

- One big open question is how you deal with inbound connections with two possible EIDs
- Need to gather a lot more data on how this would work in the real world
- Better understand security
- .....

Some Open Questions

- Did we miss anything?
- Which is uglier – PTRs or Source-NAT

References (incomplete)

- Background Information
  - Route Scalability work (vaf, jason, et al)
  - RAWS Report
- RRG List
- LISP
- CONS


LISP
RULES