There and *Not* Back Again

Or How to Stop Route Leaks

Motivation

- Desire to improve security (SIDR's BGPSEC)
- Known problem
- Lack of definition is hampering efforts

Comedy of Errors

- “What’s a route leak?”
- Chicken & egg issue
- Tends to immediately rat-hole

Getting It, Backwards

- What isn't a Route Leak?
- What should *not* be announced?
- Where should leaks be identifiable?

What a Route Leak Isn't

- Concept of "Customer" – does not *need* to be defined strictly!
- Customer is a "universal donor"
  - Everyone is willing to accept Customer routes
- Customer is a "universal recipient"
  - Customers generally want it all
- Route Leak: sending a non-customer route to a non-customer neighbor

Neighbor Categories are Key

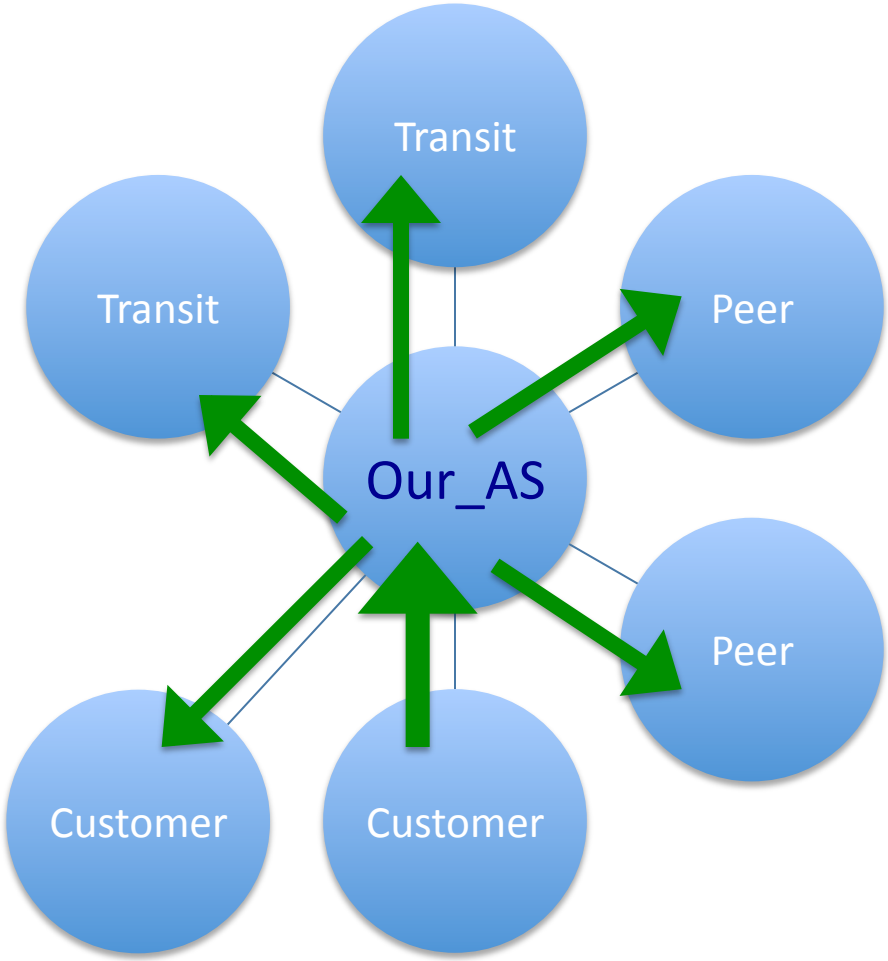
- The categories are per-neighbor-instance
- Superset of (and consistent with) local policy
- Four types based on local-remote relationship:
  - Peer – Peer
  - Customer – Transit
  - Transit – Customer
  - Mutual-Transit – Mutual-Transit
- Based on whether non-customer routes ok
- Based on, but independent of, “customer” definition!

Route Leaks are not Policy

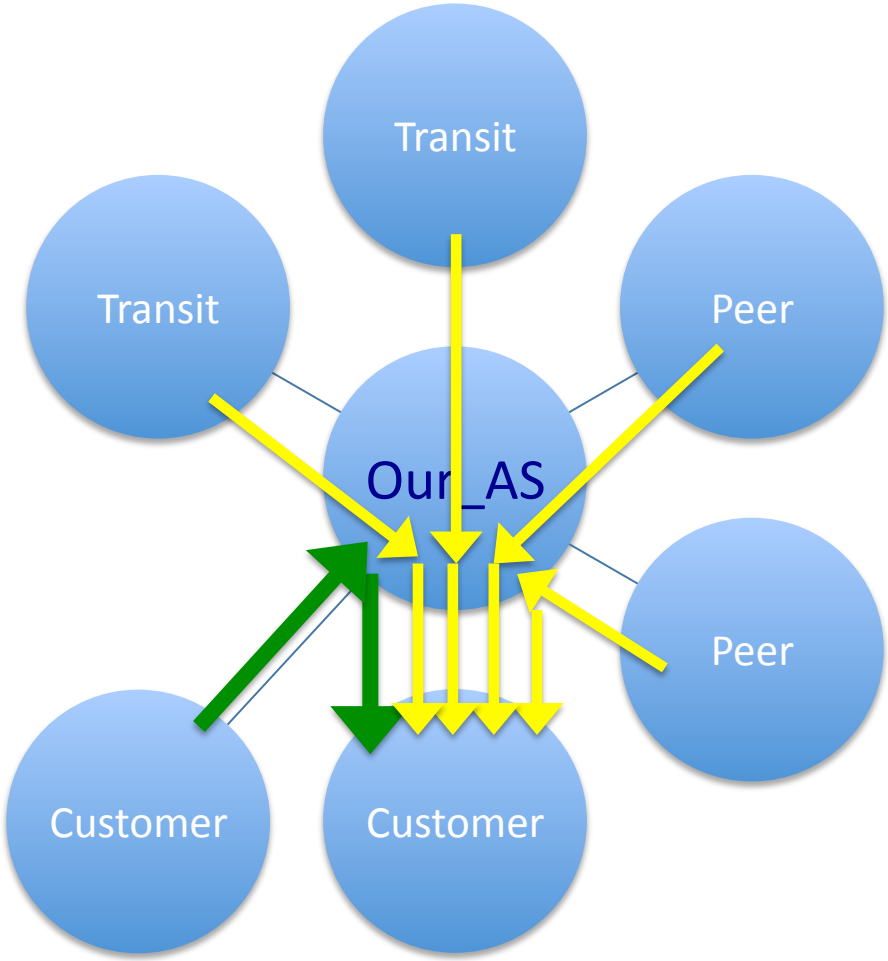
- There are already lots of tools for doing policy
- Stopping leaks is not really a “local policy”
  - Should not try to re-implement local policy
  - Tools don’t need to be useful to local policy either
  - (But they can be)
- Not “belt + suspenders”; “seat belt + air bag”!

Diagrams – Start Simple

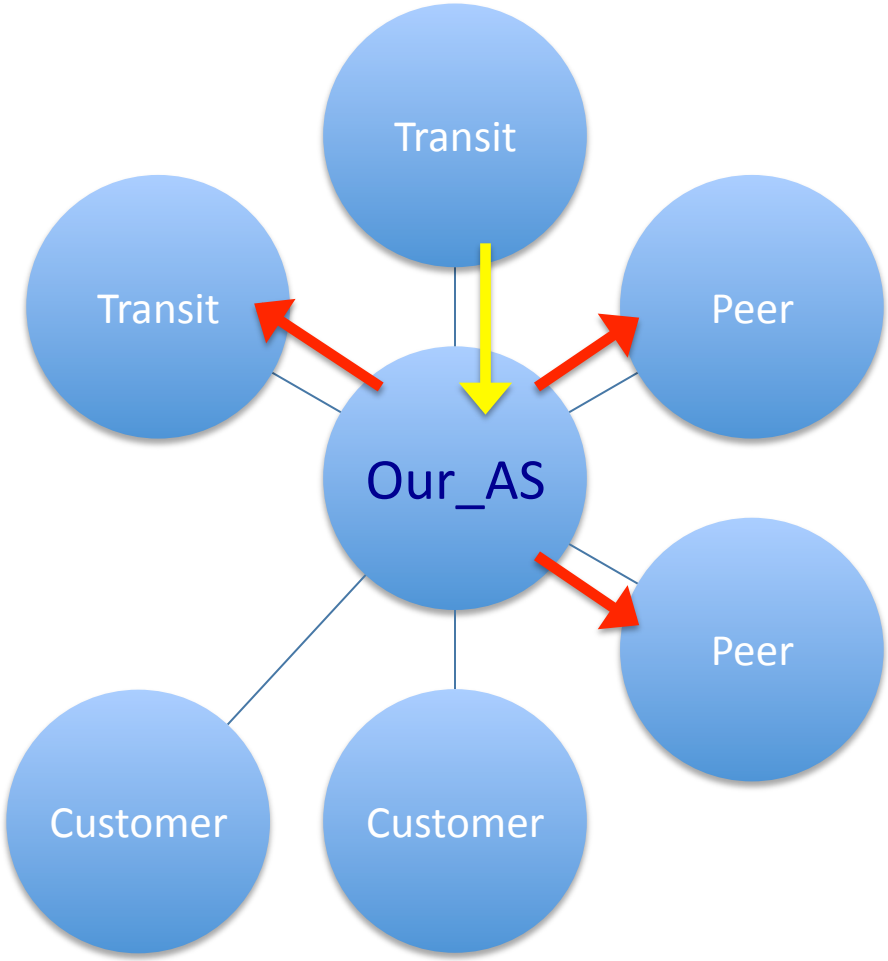
Customer -> All – Good



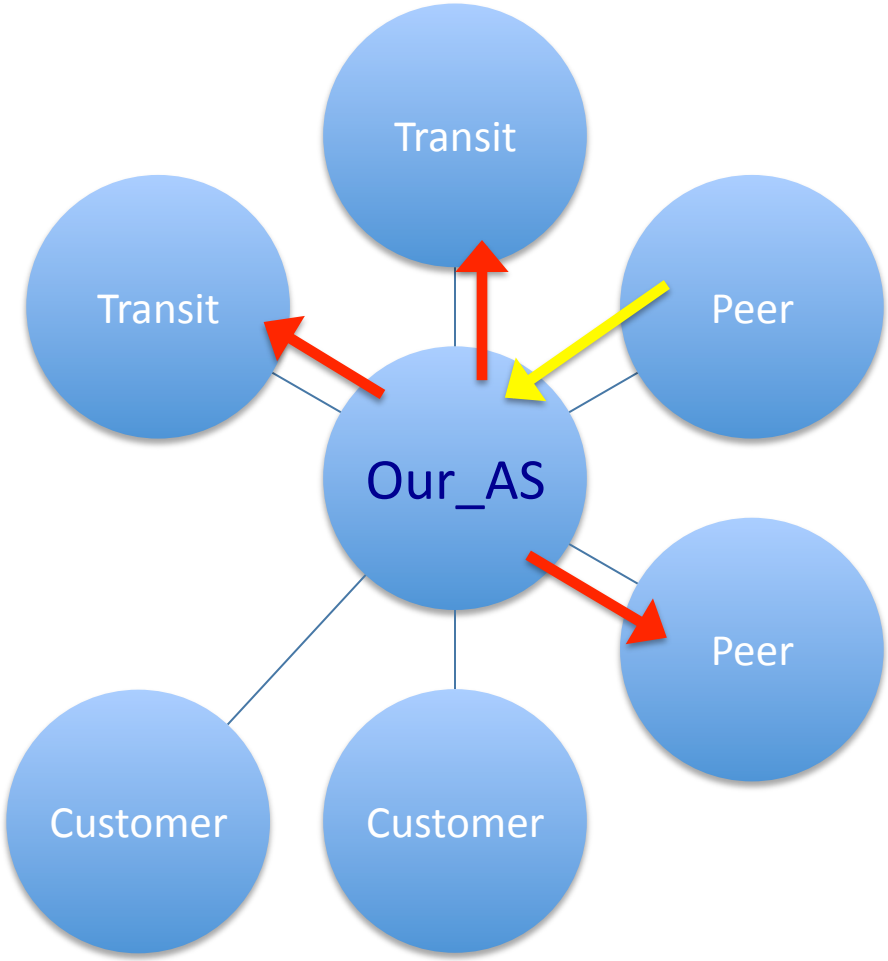
All -> Customer – Good



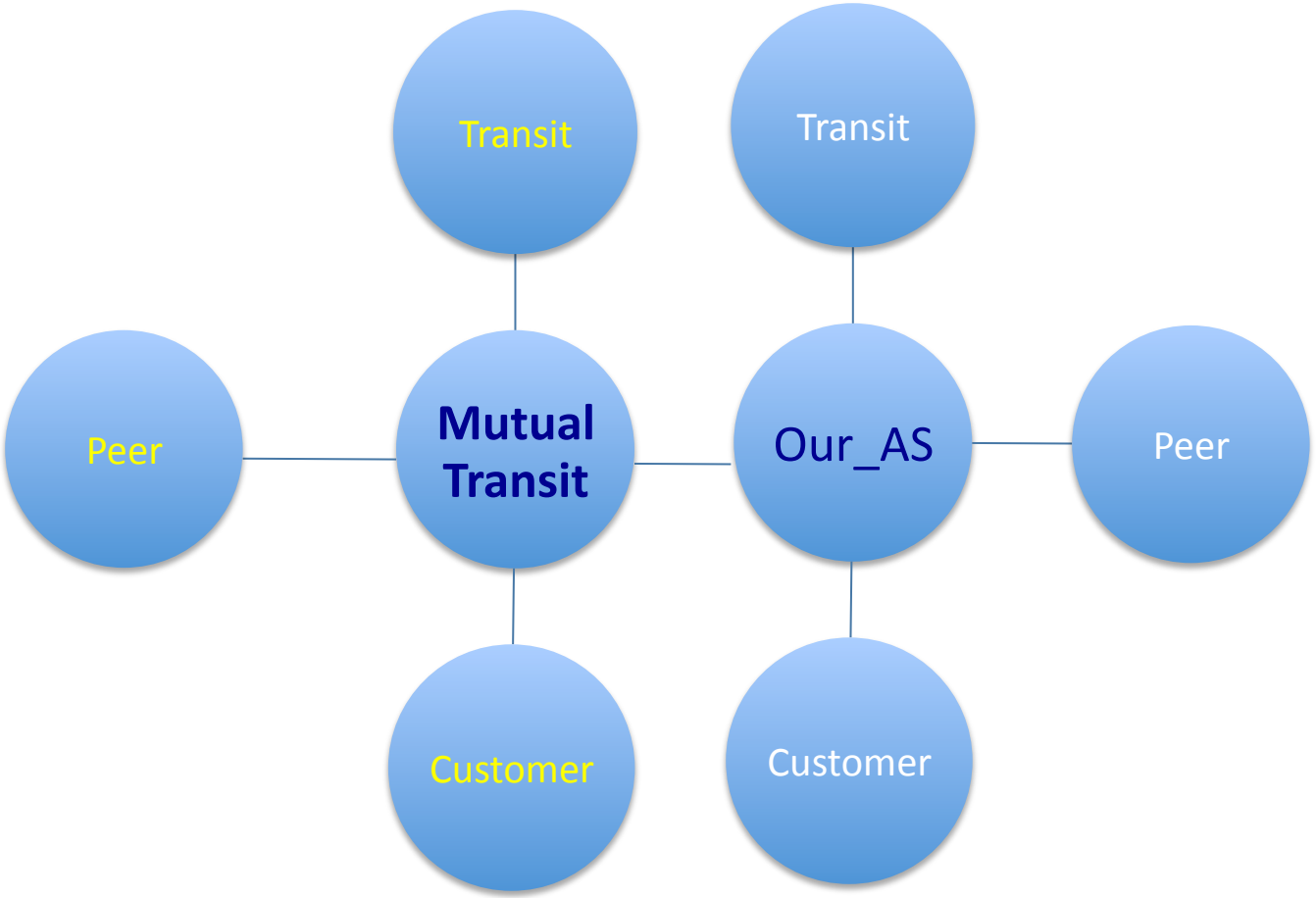
Transit -> Transit/Peer – LEAK



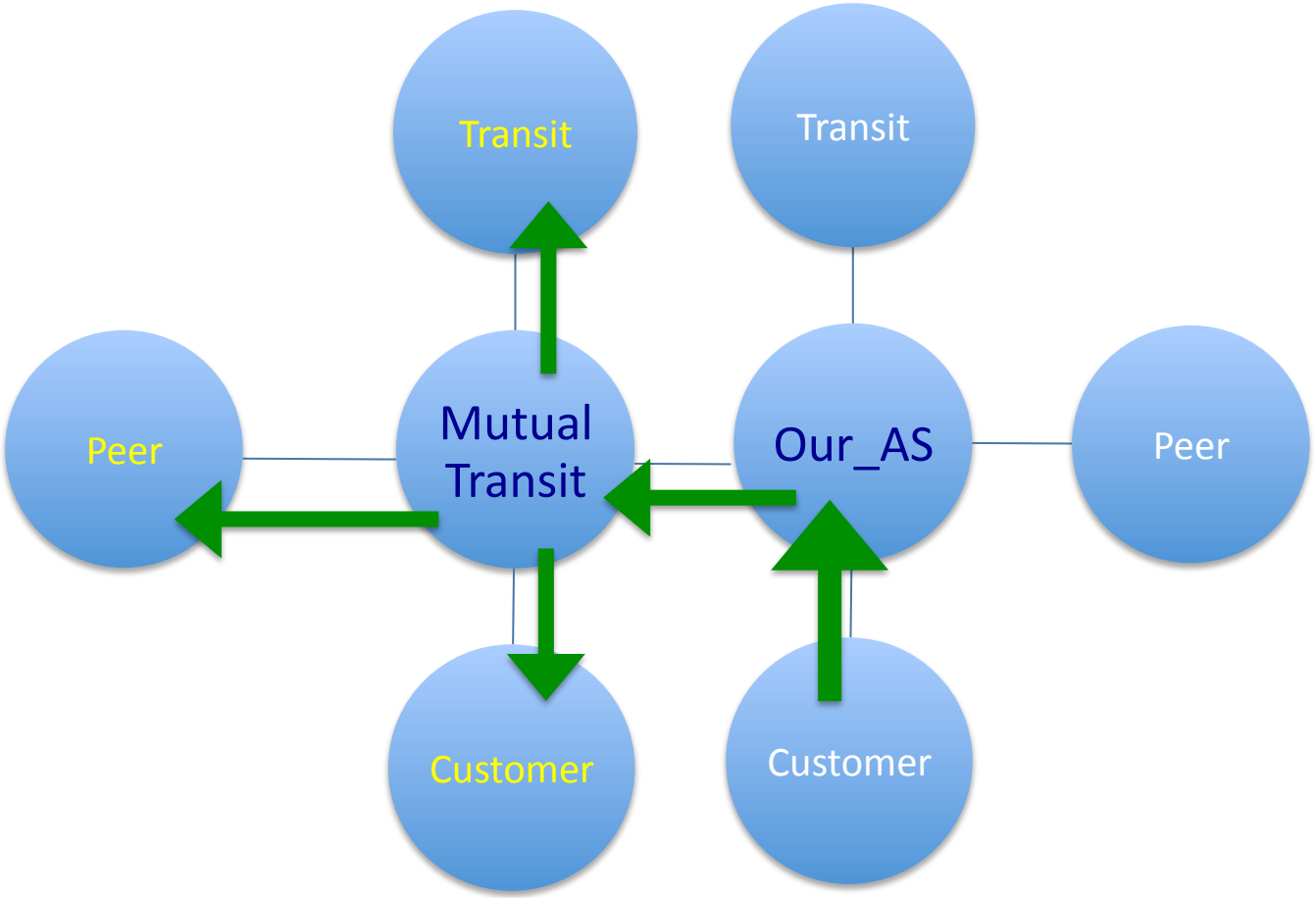
Peer -> Transit/Peer – LEAK



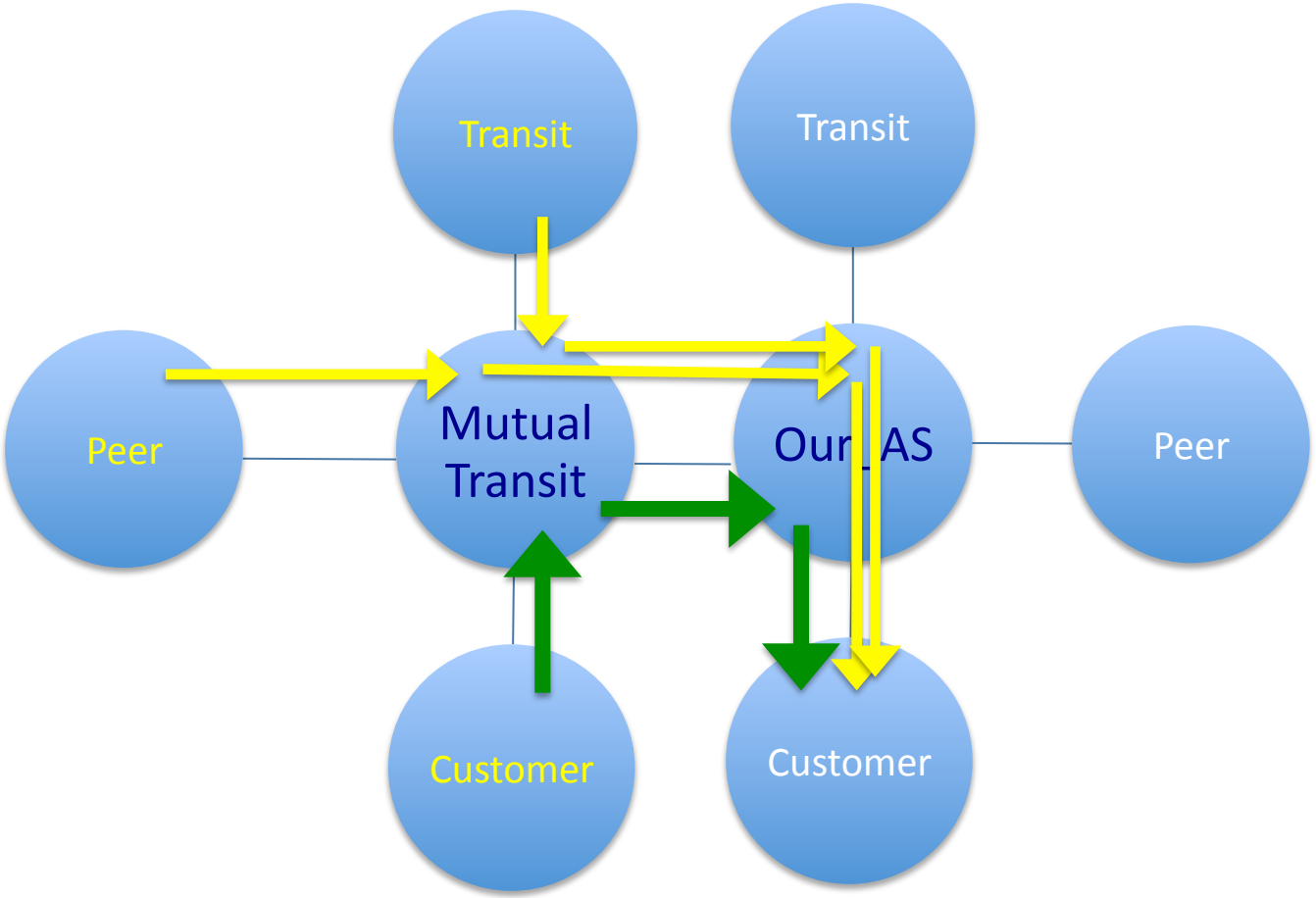
Diagrams – Now with Mutual Transit



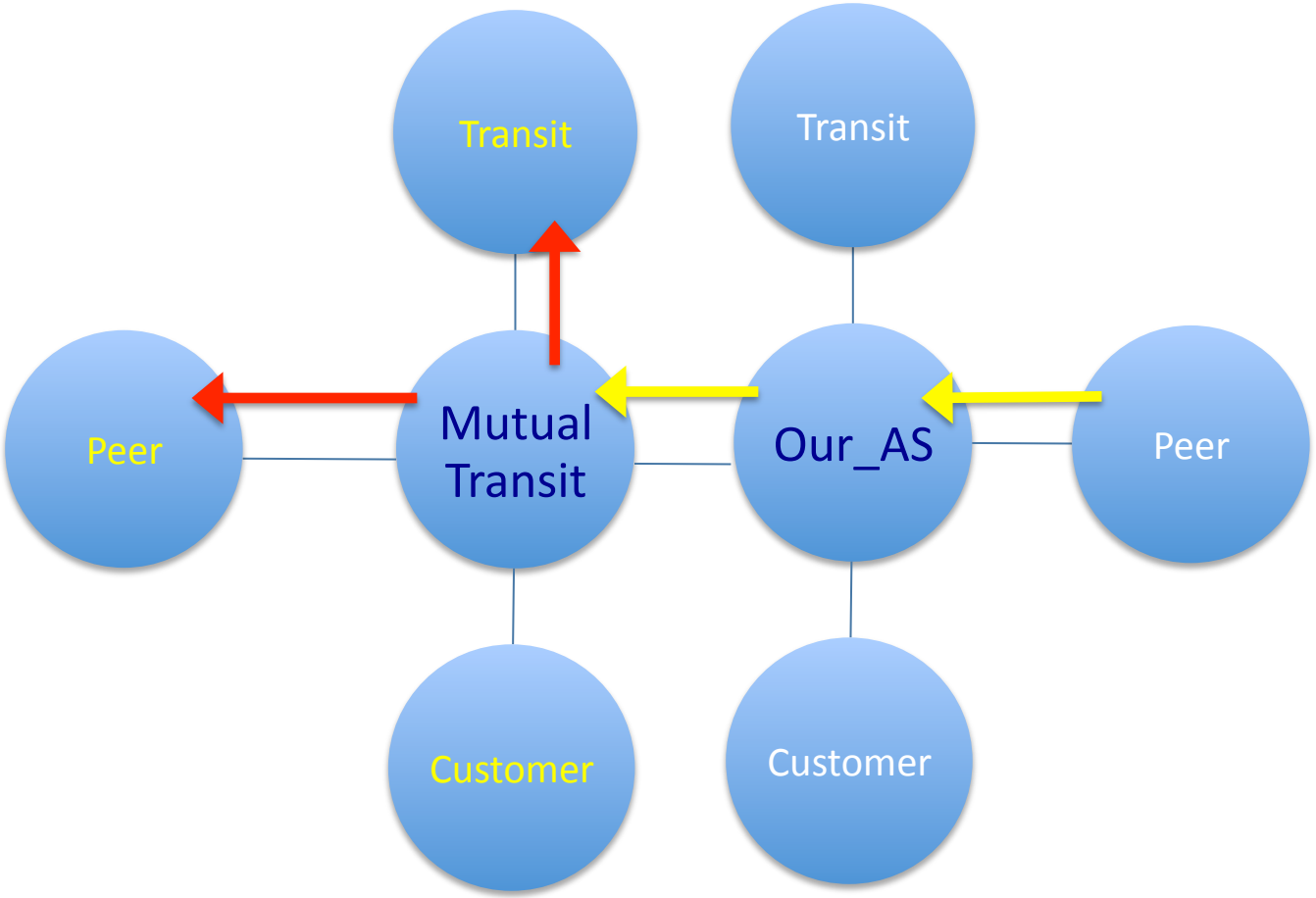
Our Customer -> All – Good



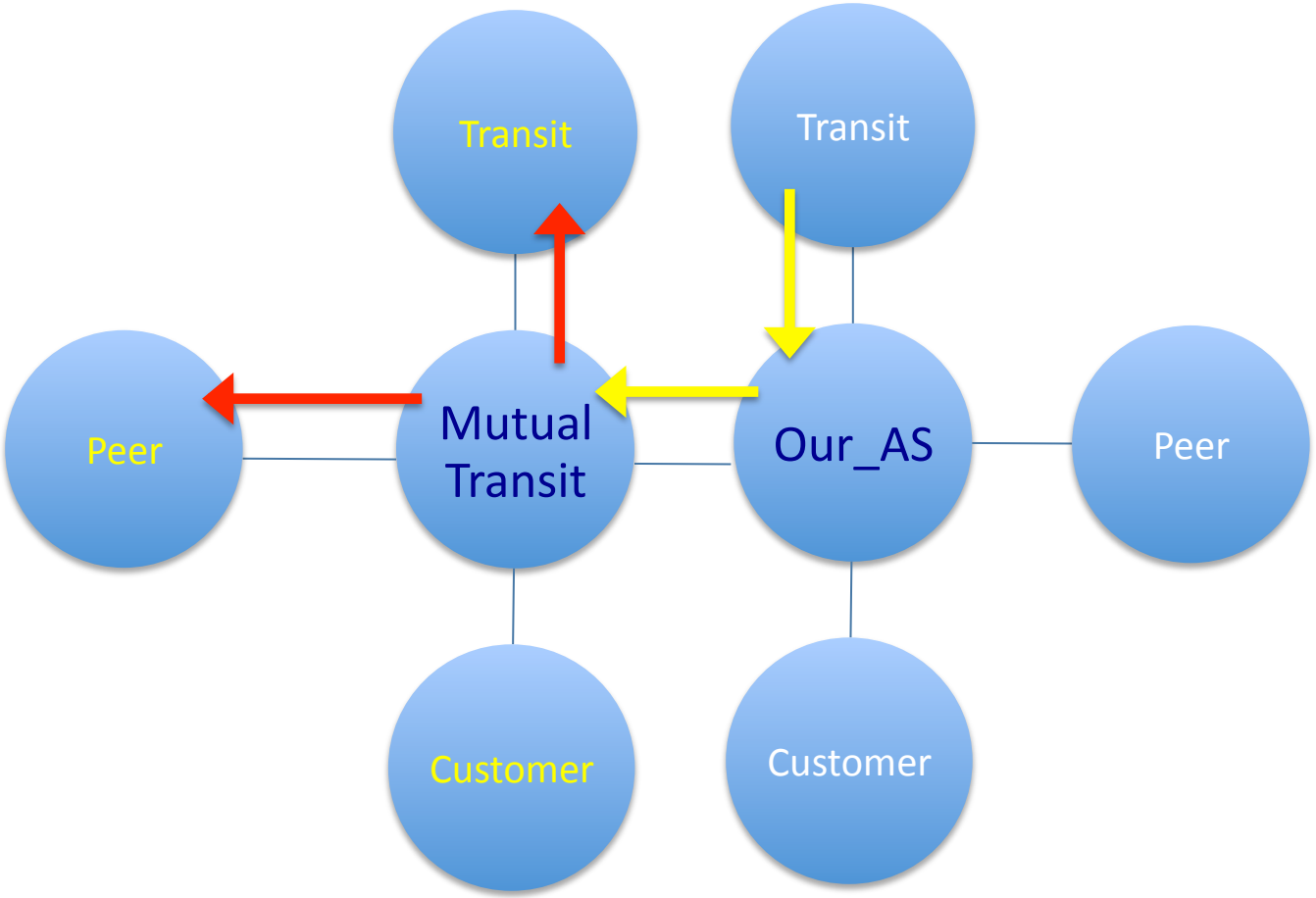
All (via MT) -> Customer – Good



Peer -> Any Transit/Peer – LEAK

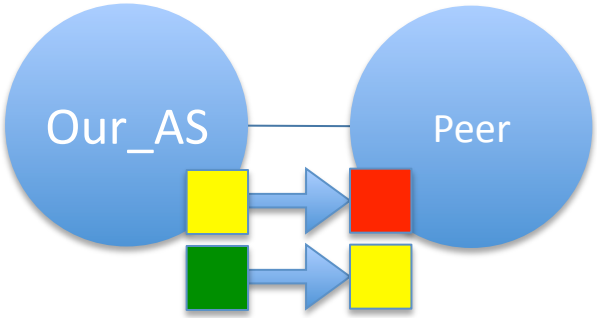


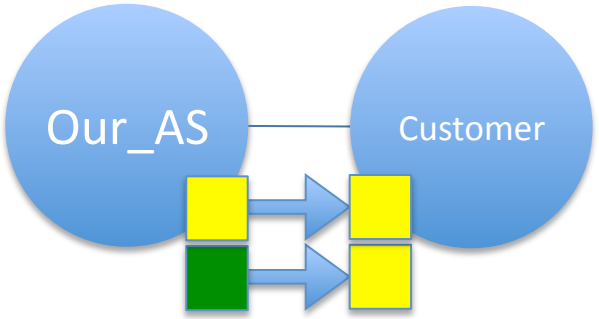
Transit -> Any Transit/Peer – LEAK

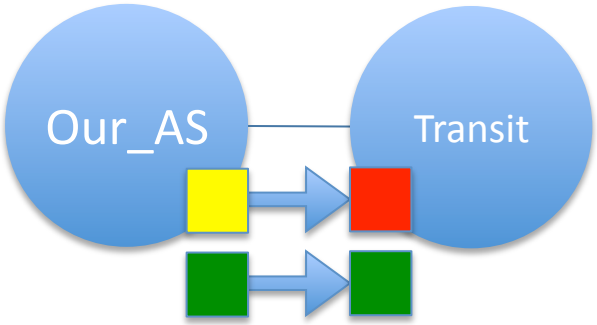


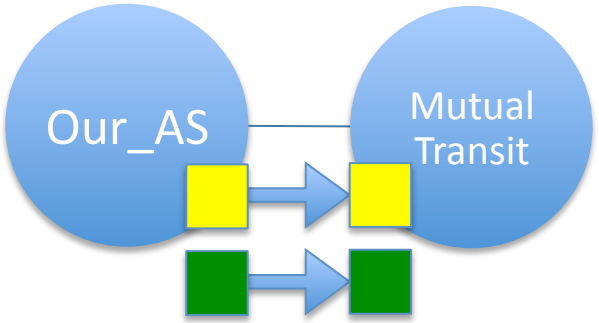
Color Markings and Transitions

- In order to reconcile sent colors vs received colors, certain transitions are needed; to stop leaks, additional filtering is done (red):



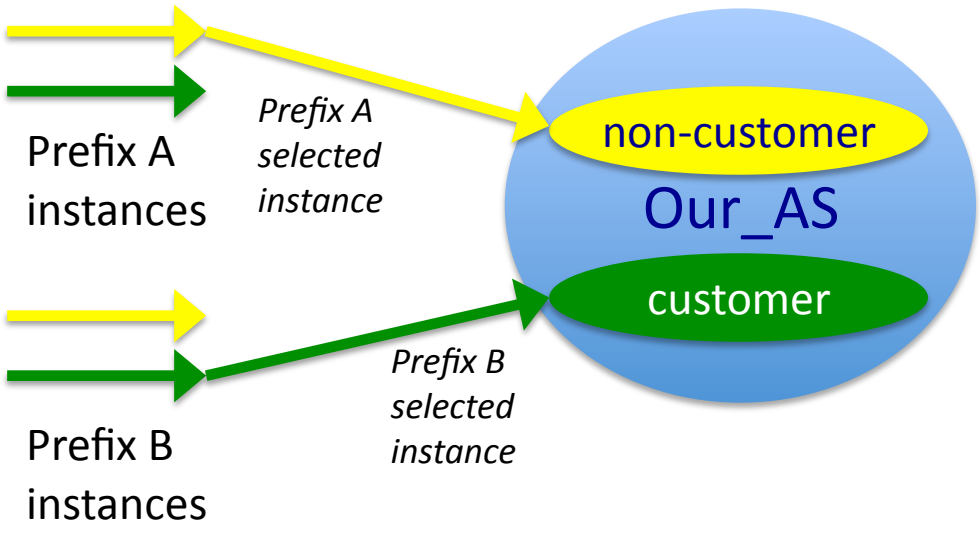






New Diagram Details

- In order to combine multiple prefixes from multiple sources, we need an additional element: a RIB color partition



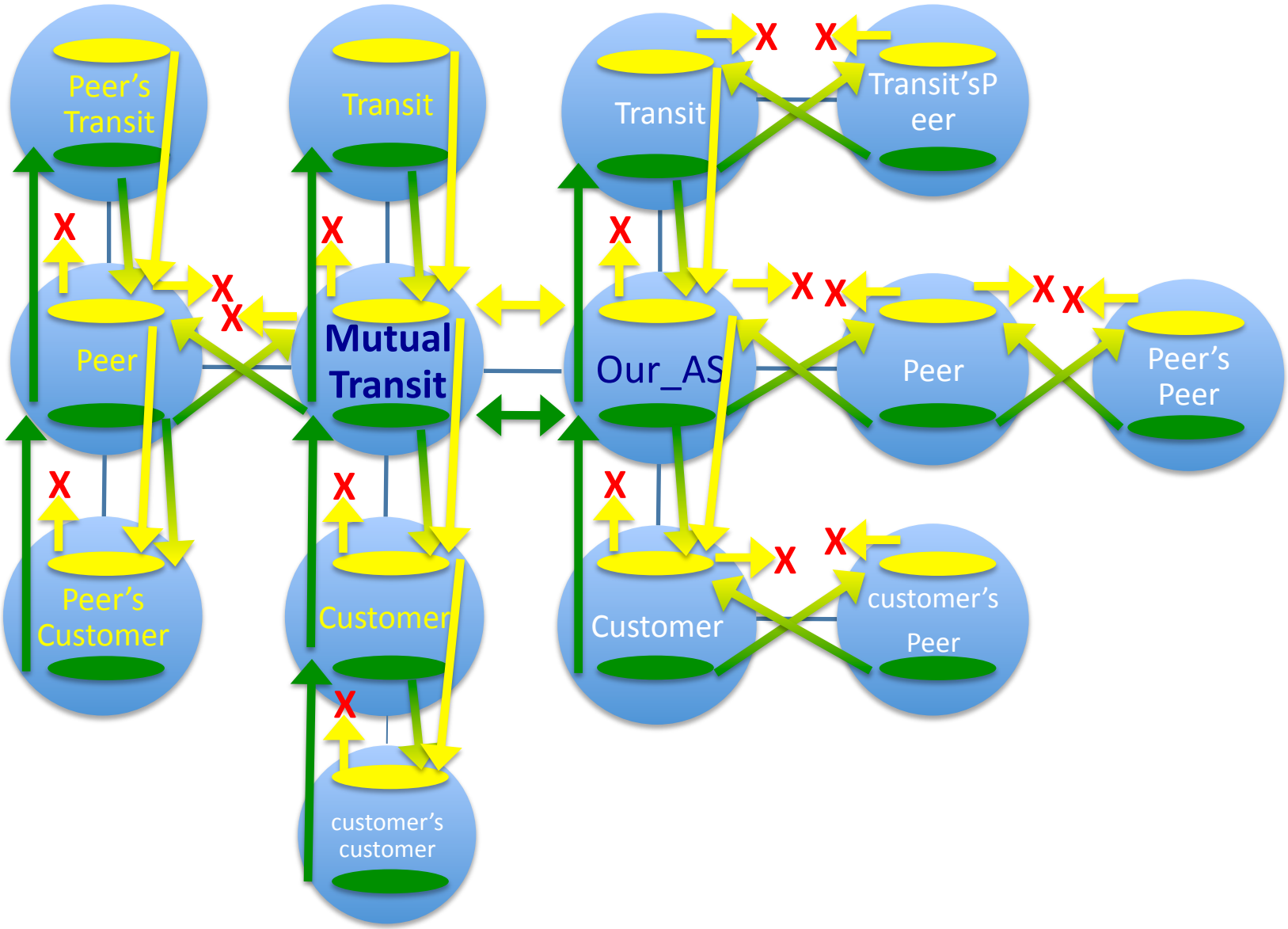
Best-path logic is dictated by local policy.

The color "partition" is merely a Venn-diagramatic convenience.

There is still only one RIB.

We are illustrating that "best" paths inherit color from their IN-RIB, i.e. whatever the received color was.

The BIG PICTURE



Route Leak Blocking Logic

- Expressed as a neighbor-type matrix
- X marks the Leak (block the leak)

Dest / Source (color)	Peer	Transit	Mutual-Transit Non-Customer	Mutual-Transit Customer	Customer
Peer (yellow)	X	X	Yellow	X	Yellow
Transit (yellow)	X	X	Yellow	X	Yellow
Mutual-Transit Non-customer (yellow)	X	X	Yellow	X	Yellow
Mutual-Transit Customer (green)	Yellow	Green	X	Green	Yellow
Customer (green)	Yellow	Green	X	Green	Yellow

The Internet Drafts

- There are three drafts in a very early stage
  - Definitions, Requirements, and Proposed Solutions
- Please consider reading them and giving feedback
- The main questions are:
  - Is it safe?
  - Is it correct?
  - Should it be adopted by IDR?
  - Should it be included in SIDR's scope?

Any Questions?

- Sorry I'm not here in person
- Brian Dickson
- (Currently individual work by me)
- brian.peter.dickson@gmail.com
- bdickson@verisign.com
- Thank you, especially chairs, scribes, and volunteers.