

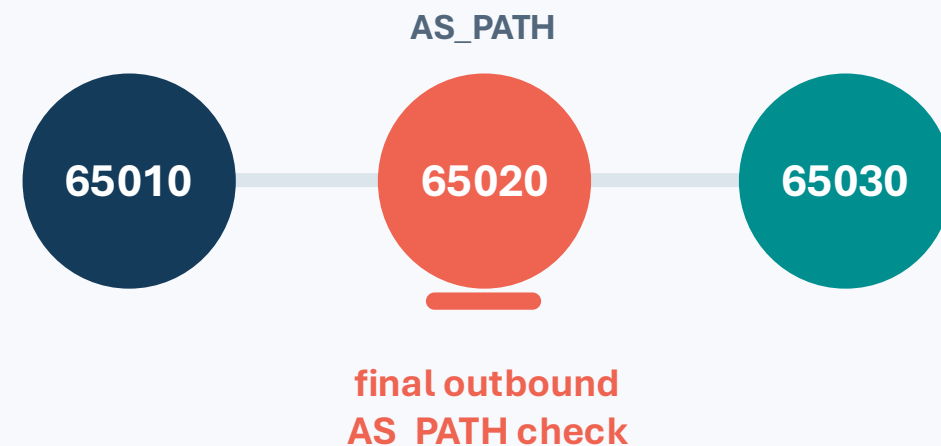
ASPA-based AS_PATH Verification for BGP Export

Catch ASPA-invalid paths before they leave your network

draft-zhang-sidrops-aspa-egress-05

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github.com/joycezhangjia/ASPA-egress-demo



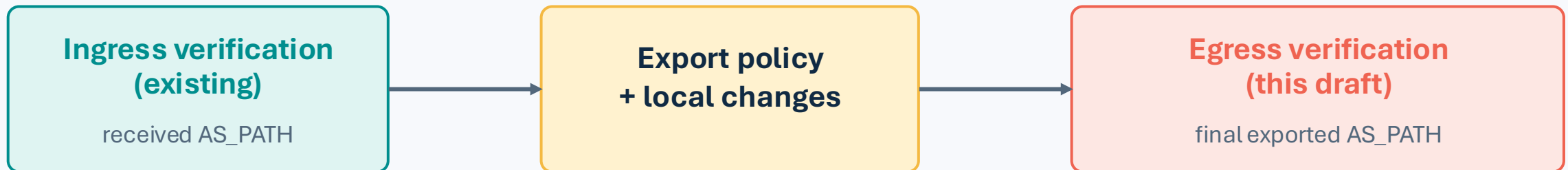
From RPKI ASPA data to egress path verification

ASPA is RPKI data

Signed records authorize provider relationships between ASes.

ASPA-based AS_PATH Verification is the algorithm

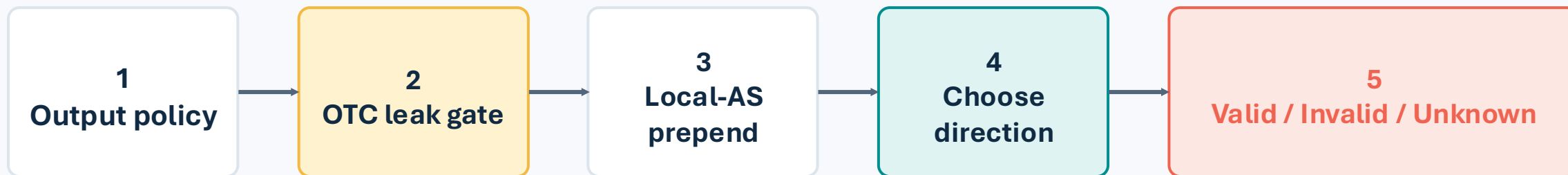
It uses that data to verify a path as Valid, Invalid, or Unknown.



Ingress verification remains unchanged. This draft adds a final operational assurance check before export.

The benefit is simple: catch ASPA-detectable export mistakes before they propagate to a neighboring AS.

Verify the path the neighbor will actually receive



Direction follows the configured local BGP Role

Local provider

Downstream Verification

Neighbor is a customer

Local customer / peer / RS client

Upstream Verification

OTC leak signal remains the earlier hard gate

Invalid: monitor or filter according to deployment mode

We added a per-neighbor control to OpenBGPD

OpenBGPD configuration

```
neighbor 192.0.2.2 {  
  role customer  
  aspa-egress enforce  
}
```

off monitor enforce

Built on the existing ASPA engine

- New outbound call site - no new ASPA algorithm
- Checks the final path after export processing
- Role selects Upstream or Downstream result
- Live ASPA updates trigger outbound reevaluation

BASIC EGRESS VERIFICATION

Small, reviewable changes on branch aspa-egress

Five end-to-end checks passed

Direction	Upstream + Downstream agreed with receiver-side results	PASS
Final path	Automatic local-AS prepend + two policy prepends	PASS
Modes	off / monitor / enforce propagated as expected	PASS
Live data	ASPA updates withdrew and restored routes without reset	PASS
OTC	Blocked an otherwise ASPA-Valid route before ASPA egress	PASS

Observed route states

VALID

INVALID

UNKNOWN

Ubuntu 22.04 | OpenBGPD portable | ExaBGP

The prototype works; context-rich cases are next

Working now

- Basic Upstream and Downstream egress checks
- Per-neighbor monitor and enforce modes
- OTC precedence and live ASPA reevaluation

Future Plan

- RS-client to Route Server end-to-end test
- Neighbor-AS-Augmented Verification
- Backup paths, Add-Path, and performance
- Per-route context for complex relationships

Code, tests, and experiment topology

github.com/joycezhangjia/ASPA-egress-demo

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