BGP Roles and More

Alexander Azimov, Yandex

Sriram Kotikalapudi, US NIST

Eugeniu Bogomazov, Qrator

Randy Bush, Internet Initiative Japan & Arrcus

Keyur Patel, Arrcus

Sriram Kotikalapudi, US NIST

BGP Roles Negotiation

Provider AS

Customer AS

Notification

Open(peer)

Allowed roles:
- Provider - sender is a transit provider to neighbor;
- Customer - sender is transit customer of neighbor;
- RS - sender is a Route Server, usually at internet exchange point (IX)
- RS-Client - sender is client of RS
- Peer - sender and neighbor are peers

A Long History

2016: OTC – a single attribute for leak prevention and detection;

2016: OTC is split into non-transit iOTC and transit eOTC;

2017: eOTC design is merged with RLP;

2018: ASPA emerges;

     RLP attribute is transformed into DO community,

     iOTC is ready for WGLC…

2019: OTC is back (but has different design)!

     DO replicates OTC logic.

The Signal(s)

Leak prevention:

If a route is received from provider, RS or peer it MUST not be sent to another provider or peer. The signal is set on ingress.

Leak detection:

If a route is sent to customer, peer or RS-client it also MUST follow 'only down' rule. The signal is set on egress.

OTC: Setting

Egress policy:

If route is sent to customer, peer or RS-client and the OTC attribute is not set it MUST be added with value equal to AS number of the sender;

Ingress policy:

If a route is received from a Provider, Peer or RS and the OTC attribute has not been set it MUST be added with value equal to AS number of the neighbor (sender).

OTC: Setting

Provider AS

Customer AS

Set on egress:
OTC=Provider AS

Set on ingress:
OTC=Provider AS

No matter who sets the signal – the value is the same.
The signal is indication that route can be sent only to customers!
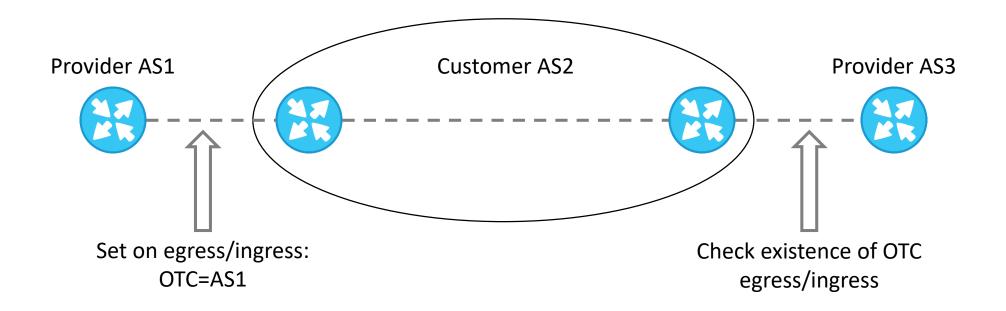
OTC: Prevention & Detection

Egress policy (before egress marking):

- A route with the OTC attribute set MUST NOT be sent to providers, peers, or RS(s).

Ingress policy (before ingress marking):

- If a route with OTC attribute is received from Customer or RS-client - it's a route leak;
- If a route with OTC attribute is received from Peer and its value isn't equal to the neighbor's ASN - it's a route leak.

OTC: Prevention & Detection

What Should We Do with Route Leaks?

The only acceptable mitigation policy – route leaks MUST be rejected.

This mitigation policy SHOULD be used.

Will be discussed in detail during GROW meeting.

Attribute vs Community

Attribute:

- More reliable signal;
- Memory efficient;
- Reserved for specific use.

Community:

- Easy to implement!

Choose between? No, we'll take both!

Summary

- Non-transit iOTC is transformed into transit OTC;
- Marking on both ingress and egress filters;
- Filtering on both ingress and egress sides;
- Prevention & detection using a single attribute;
- Roles provide automation;
- Large community and attribute with the same logic.