



Cascading ALTO

IETF-116

Ingmar Poese

27/03/2023

About BENOCS

Location: Berlin, Germany

Industry: Telecommunications,
Network Telemetry

Mission: To improve network traffic
conditions and visibility



2013

Founded as a Spin-off of Deutsche
Telekom

2015

First live customers for BENOCS
Director

2018

Fully developed BENOCS Analytics
enters the market

2020

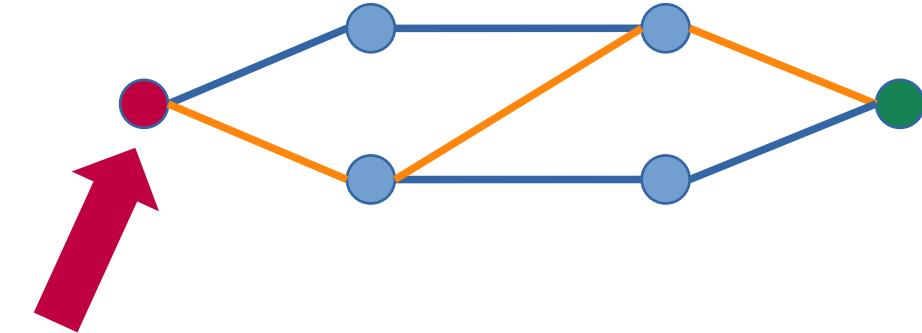
Customer base expanded globally

CE (Core Engine) Architecture

General Architecture

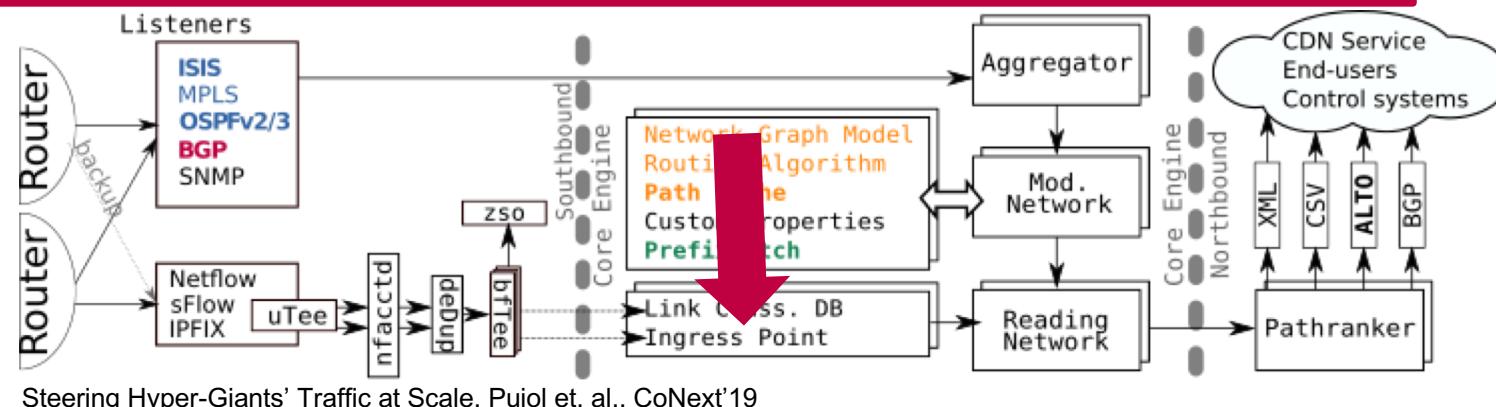
Gather Information

- Primarily from control plane
 - **IGP** (IS-IS, OSPFv2/3)
 - **BGP** (RR-connection to all border routers)



- **Building an ALTO map based on this information depends on the ingress point**

ized format



FROM:

Challenge 1: Ingress Point

Definition

Determine where traffic from an IP/subnet enters the network

Easy

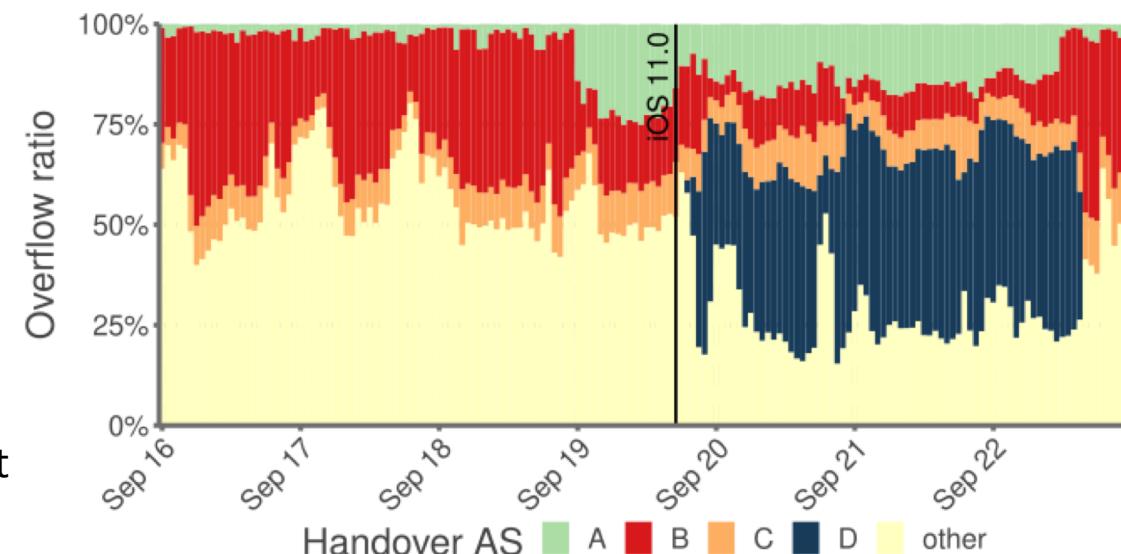
Traffic enters via caches/PNI. No path asymmetrical path, no middle party(s), bi-lateral relationship

- This is the majority of the traffic

Hard

Traffic enters via Peering.

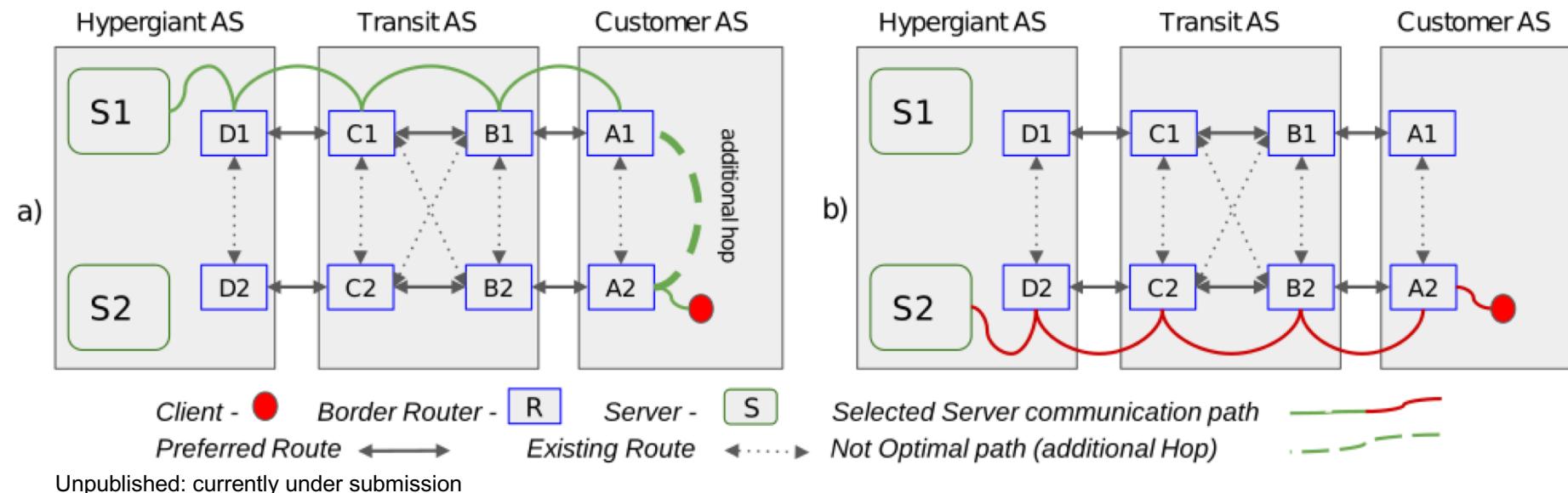
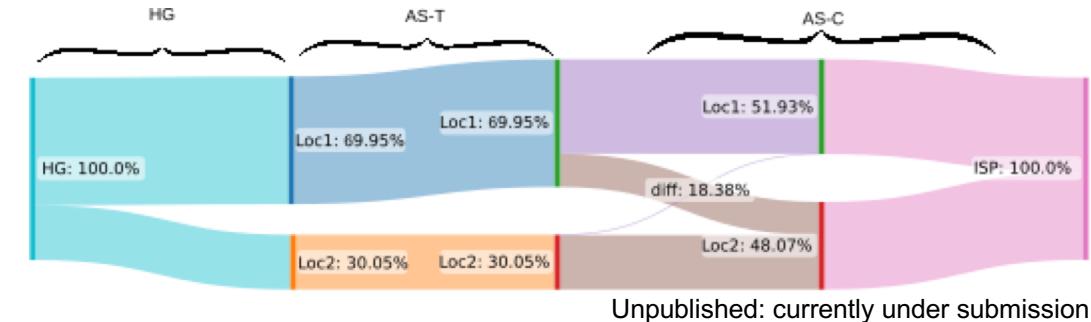
- IGP/BGP cannot be used
 - Inference statistically via Dataplane
- Compute/Data heavy operation
- Needs to always be up to date
- “Small” amount of overflow can have severe impact



Challenge 2: Cascading Path optimization

Multi Tier ASN Setup

- Larger networks run multiple ASNs.
 - Can be private or official ASNs
 - One company or conglomerate of companies
- HG/CDN caches are usually deployed in the parent ASN
- Ingress Point issues resurface
“Not optimal” scenario



Solution: Multi-domain ALTO

Multi-Domain ALTO to the rescue

- Partial path information from different ASNs along the AS path builds a full overview
 - AS-State map made up if link-state protocol networks ?
- Individual, inaccurate(?), data-heavy operations can be ceased
 - ALTO now supplies the information
- ALTO can solve this issue by supplying Maps for each individual network
 - One (replicated) Meta-ALTO collects the maps and builds a full overview (DNS like ?)
 - Each local ALTO pulls information from all other ALTO individually.
-