

Computing-Aware Traffic Steering (CATS) Operations, Administration, and Maintenance (OAM) Framework

draft-fu-cats-oam-fw-05

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Updates from Last Version

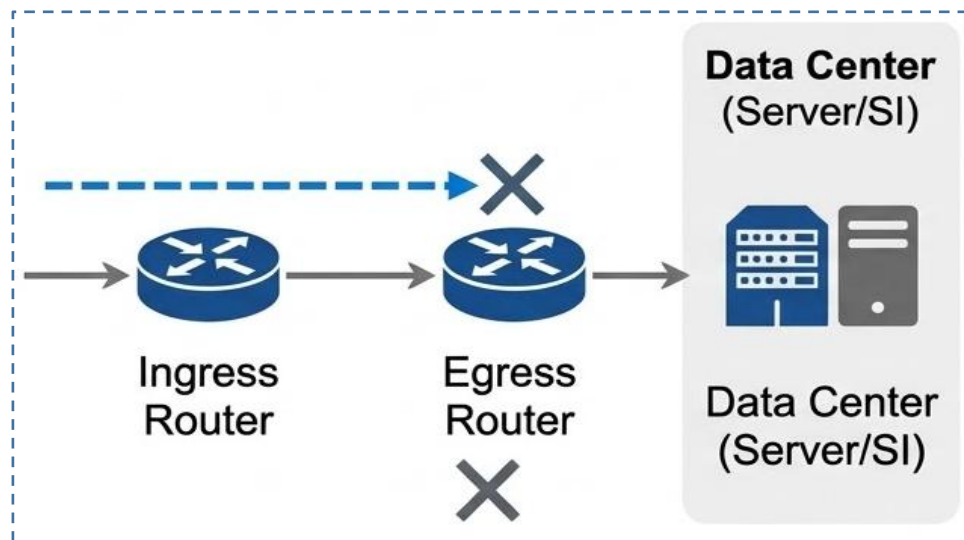
- Presented at IETF#124 and the comments and suggestions are very appreciated at the meeting and on the mailing list from :
 - Adrian Farrel/Erum Welling/Cheng Li
- Updates from version -04 to -05
 1. **clarify the motivation and the problem based on [draft-opsarea-rfc5706bis-06] from Adrian's suggestion:** updated the motivation for CATS OAM, emphasizing the functional gaps in existing OAM frameworks and the necessity of bridging network reachability with service availability.
 2. **update the CATS layering model:** refined the CATS OAM Layering Model by dividing it into four layers: Link OAM, Path OAM, Instance OAM (SI-OAM), and Service OAM (SVC-OAM).
 3. **update the CATS OAM components and definitions:** defined and clarified the roles of SI-OAM and SVC-OAM.
 4. **update the CATS OAM requirements:** Revised the OAM requirements—covering Operations, Administration, and Maintenance.
 5. **remove the Deployment Considerations**

Motivation & Problem Statement

Why do we need a new OAM?

- **Traditional OAM Gap:** Focuses only on network reachability (L3/L4), leaving the "Computing" side a black box.
- **The CATS Challenge:** A path might be "Up," but if the Service Instance (SI) is overloaded or crashed, the traffic steering fails.
- **Key Requirement:** Ensure the "Best" instance chosen by CATS is actually reachable and performing.

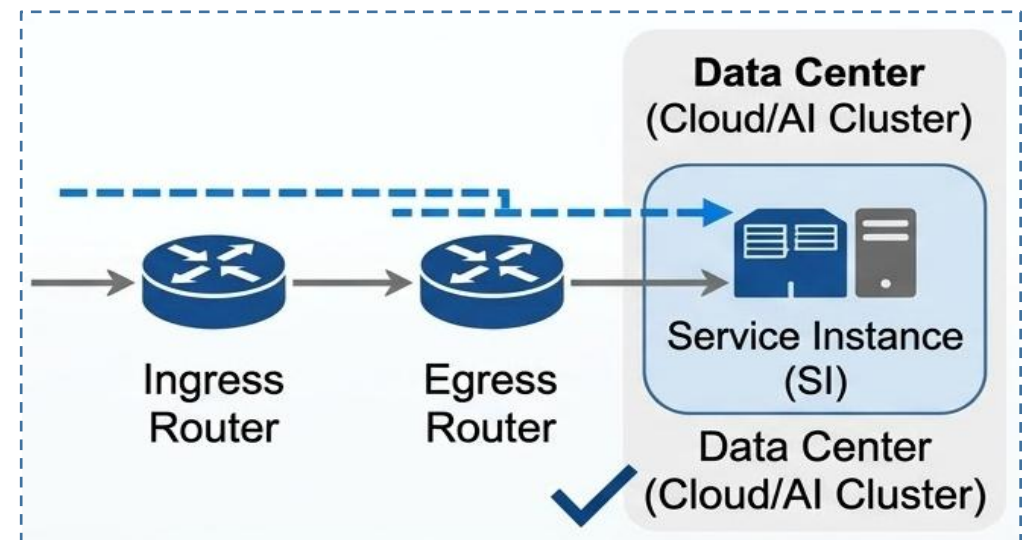
Traditional OAM



OAM monitoring **stops** at Egress Router

Focus: Network connectivity & basic performance (delay, Loss).

CATS OAM



OAM monitoring **extends** into the Service Instance

Focus: Network + Computing metrics, Service Performance, Resource Vitality

Relationship with CATS System

This Draft Complements:

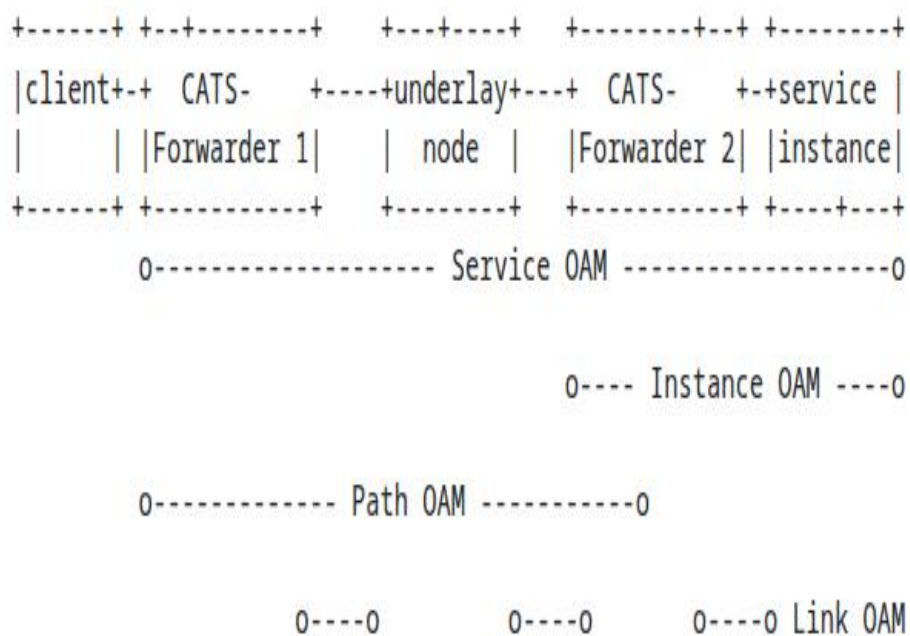
Draft	Role	Relationship
cats-framework	Base architecture (C-PS, C-SMA, C-Forwarder)	Foundation
cats-usecases-requirements	Problem statement & use cases	Why we need it
cats-metric-definition	Defines CPU, memory, load metrics	What we monitor
cats-oam-fw (this draft)	How to monitor & ensure CATS E2E service	How to operationalize

Leverages Existing IETF OAM Standards:

- RFC 7276 (OAM tools overview)
- draft-opsarea-rfc5706bis (OAM guidelines)
- RFC 6291 (Guidelines for the Use of the "OAM" Acronym)
- BFD (RFC 5880/5881), TWAMP (RFC 5357), MPLS LM-DM (RFC 6374), IOAM (RFC 9378)

Four-Layer CATS OAM Model

The CATS OAM hierarchical model leverages the principles of Maintenance Domain (MD) levels, as defined in IEEE 802.1ag and ITU-T Y.1731, to extend traditional connectivity and performance management into the service instance.



Service OAM (SVC-OAM) New!	E2E experience: Ingress CATS-FW → Service Instance (Aggregates providing E2E Visibility)
Instance OAM (SI-OAM) New!	Compute health: Ingress CATS-FW → Service Instance (Detects SI liveness and monitor metrics)
Path OAM (Reuse)	Transport path: Ingress → Egress CATS-FW (MPLS LM-DM, SR OAM, BFD for LSP)
Link OAM (Reuse)	Physical/Single-hop: IEEE 802.3ah, ICMP, BFD

Figure 1: CATS OAM Layering Model

Next Steps

- **Request more review and feedback.**
- **If necessary, consider extending OAM protocols to accommodate CATS OAM requirements.**
- **Comments and suggestions are welcome.**

Thanks!