

Protocols Applicability for CATS

draft-yxl-cats-protocols-applicability-00

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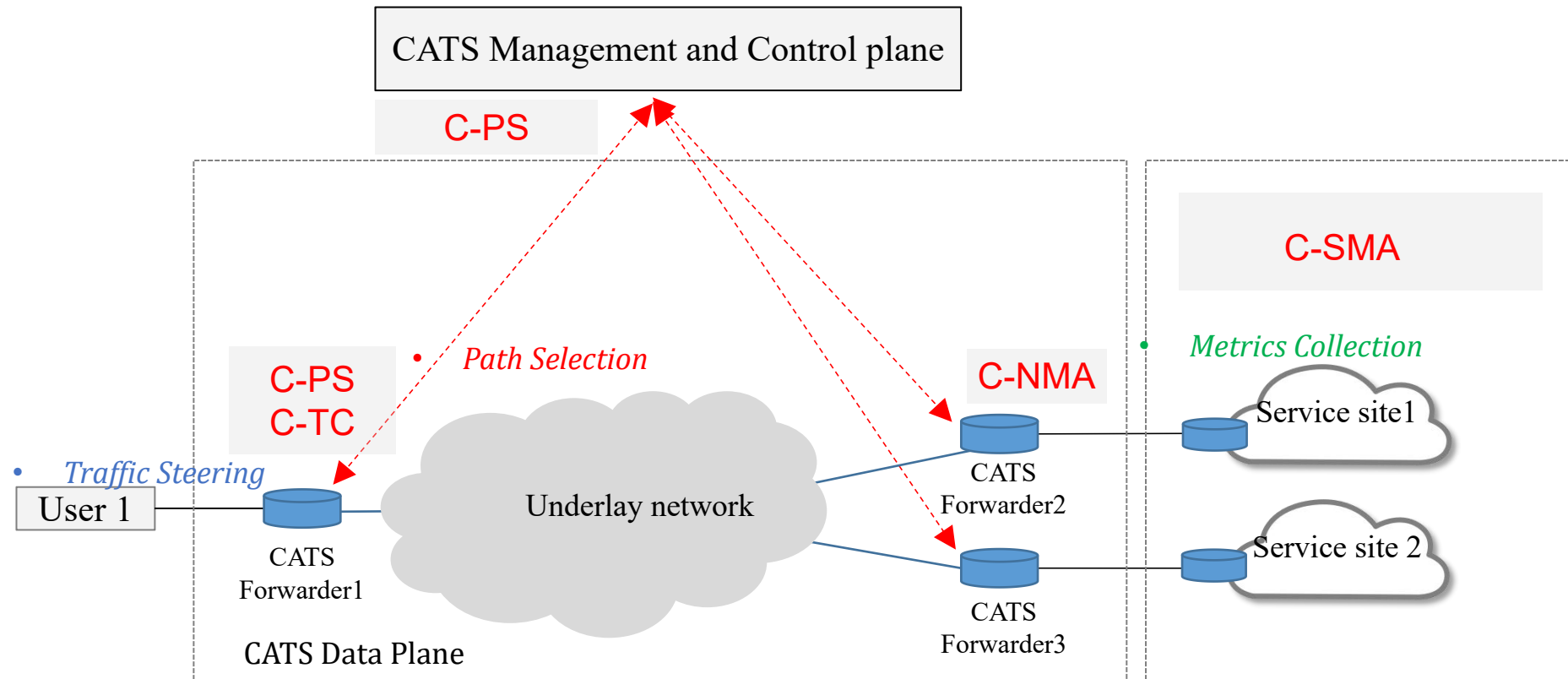
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Motivations

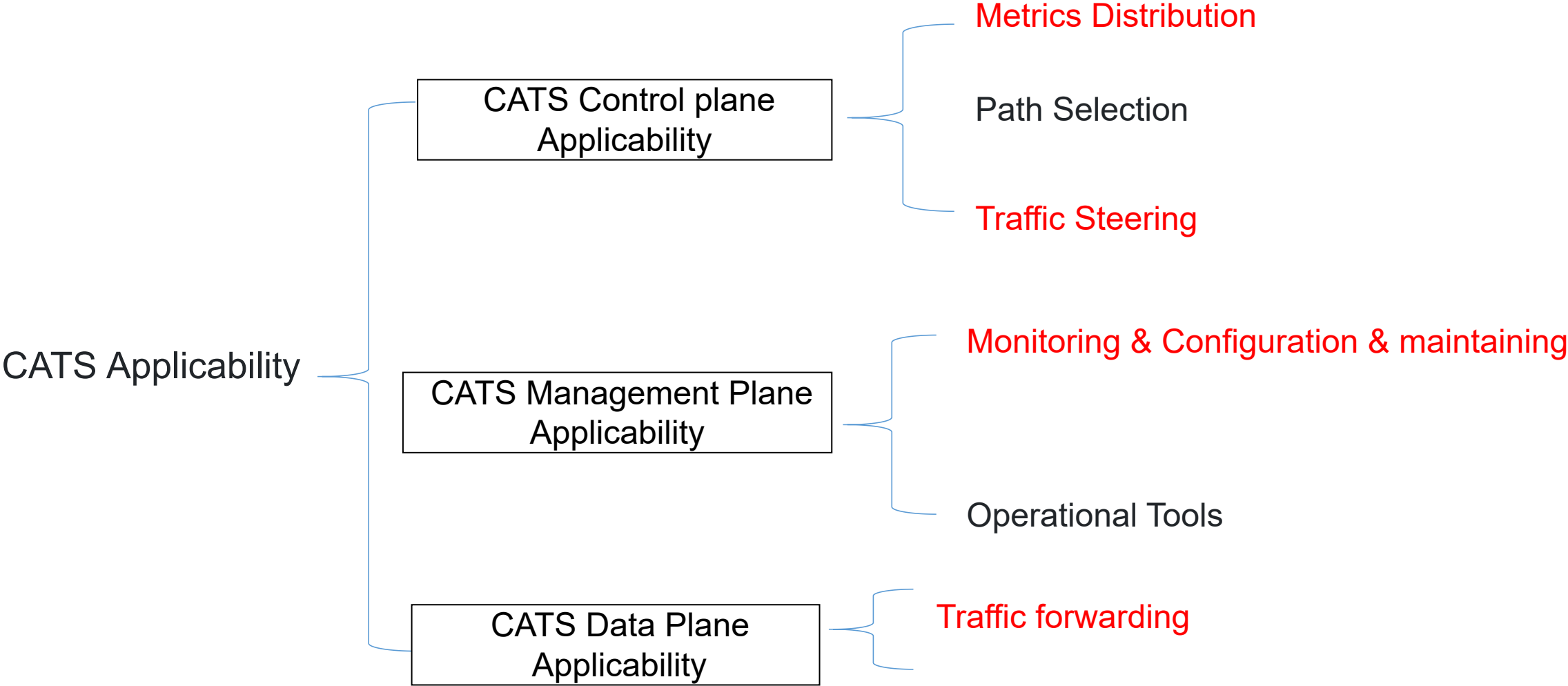
- Analyze existing IETF protocols for CATS applicability
- Evaluate extensibility for:
 - Metrics collection & distribution
 - Path selection & traffic steering
 - Service mapping & management
- No new protocol proposals – focus on analysis of the CATS applicability

CATS Framework Quick Recap

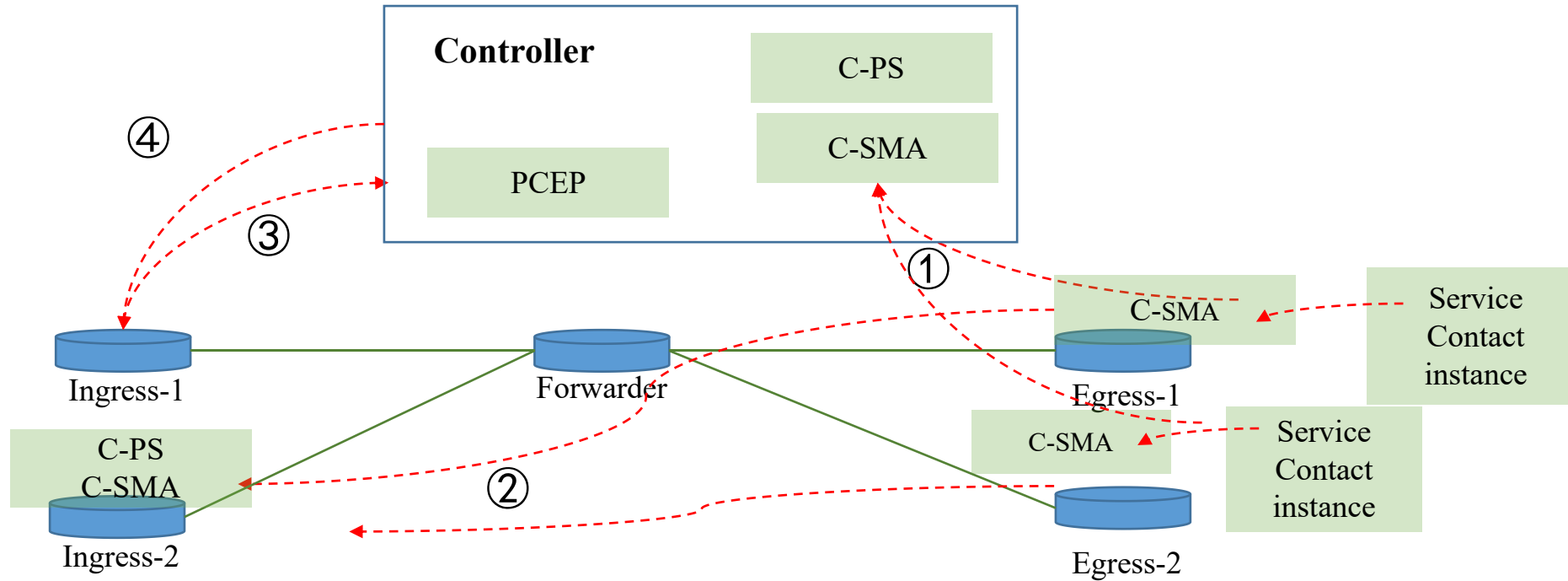


- Key Functional Components: C-SMA ,C-NMA ,C-PS,C-TC
- Three planes: CATS Management Plane + CATS Control Plane + CATS Data Plane
- Work flow: Metrics Collection → Path Selection → Traffic Steering

CATS Applicability



CATS Control Plane Applicability



Metrics Distribution:

- ① Egress(C-SMA) advertises Metrics to the C-PS via **BGP** extension or **YANG**.
- ② When distribute mode(Ingress as C-PS), Egress(C-SMA) advertises Metrics to the C-PS via **IGP, BGP** extension.

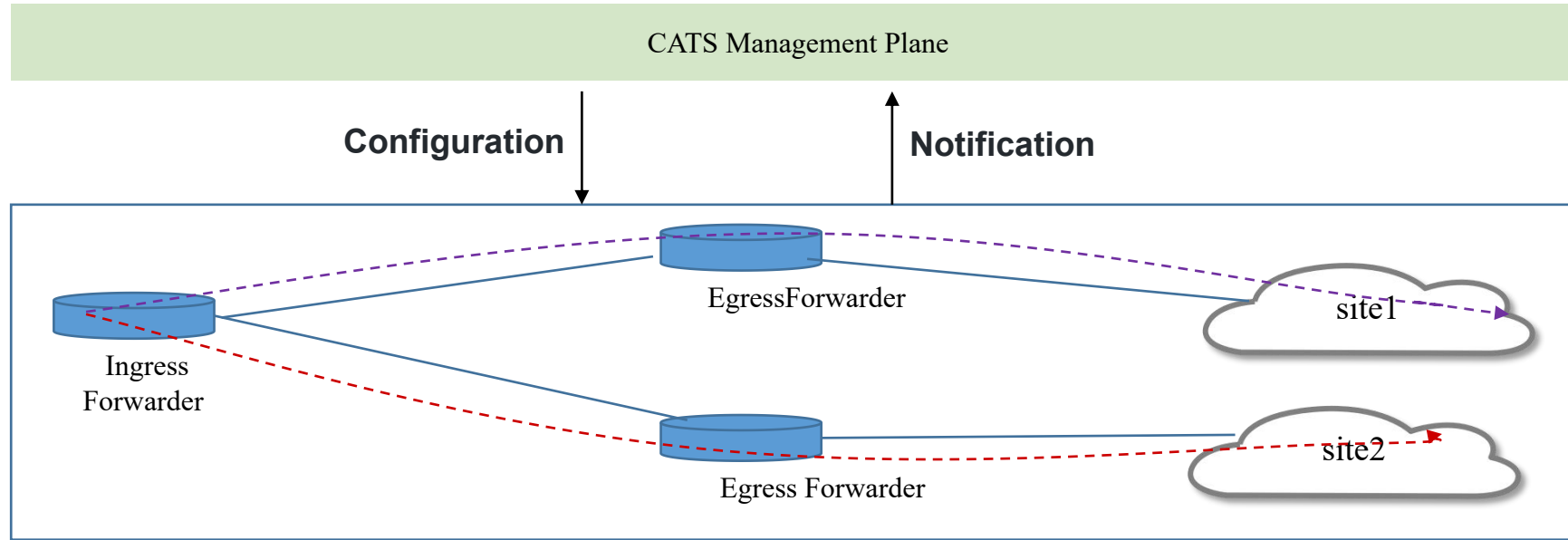
Path Selection:

- ③ C-PS calculates the optimal path and distributes it to the Ingress through **PCEP** extension.

Traffic Steering:

- ④ The controller sends routing policies to Ingress via **BGP-FS** for traffic steering.

CATS Management Plane Applicability



Configuration & Provisioning:

- YANG Data Models: Extend ietf-routing and other models to configure CATS policies, CS-ID mappings, and C-SMA/C-NMA parameters.

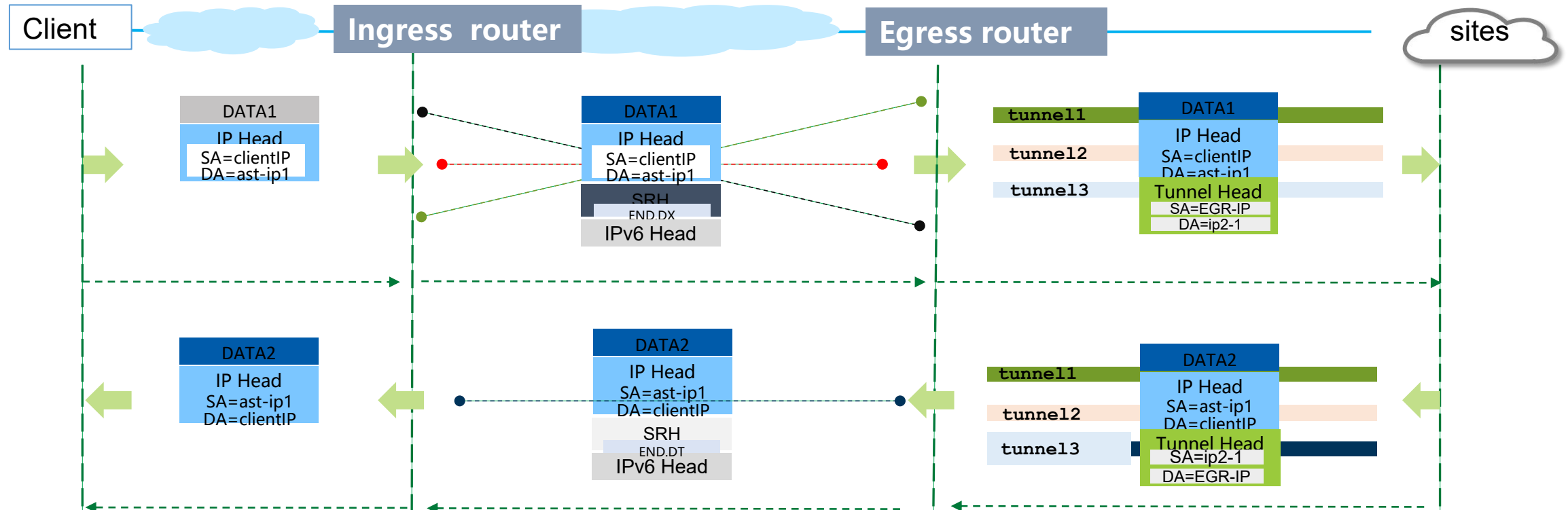
Monitoring & Telemetry:

- YANG Push / Telemetry: Stream real-time CATS flow statistics, path performance, and compute resource status to management systems.
- Enhanced OAM: Extend PING/TRACE operations to target specific CS-ID for service-level fault detection and path verification.

CATS Data Plane Applicability

Forwarding & Encapsulation: Relies on existing data planes: IPv4, IPv6, SR-MPLS, SRv6.

- **Ingress Action:** Classify packet (C-TC), encapsulate with appropriate header pointing to selected egress/service instance.
- **Egress Action:** Decapsulate and deliver to local service interface.
- **Use case for SRv6 Data-plane**



Summary of Protocol Extensions Analysis

Plane	Protocols	Possible Extensions for CATS
CATS Control Plane	BGP / BGP-LS	New attributes for compute & composite metrics.
	PCEP	New objects to carry compute constraints/preferences.
	BGP FlowSpec	New match criteria for CS-ID.
	YANG	Service Instance Information.
CATS Management Plane	YANG	Augmented models for CATS config, telemetry, and OAM.
CATS Data Plane	IPv6 / SRv6	Leverage existing mechanisms; define SID semantics for CS-ID.

Next Steps

- Any questions or comments are Welcomed.

Thanks