



LFN Developer & Testing Forum

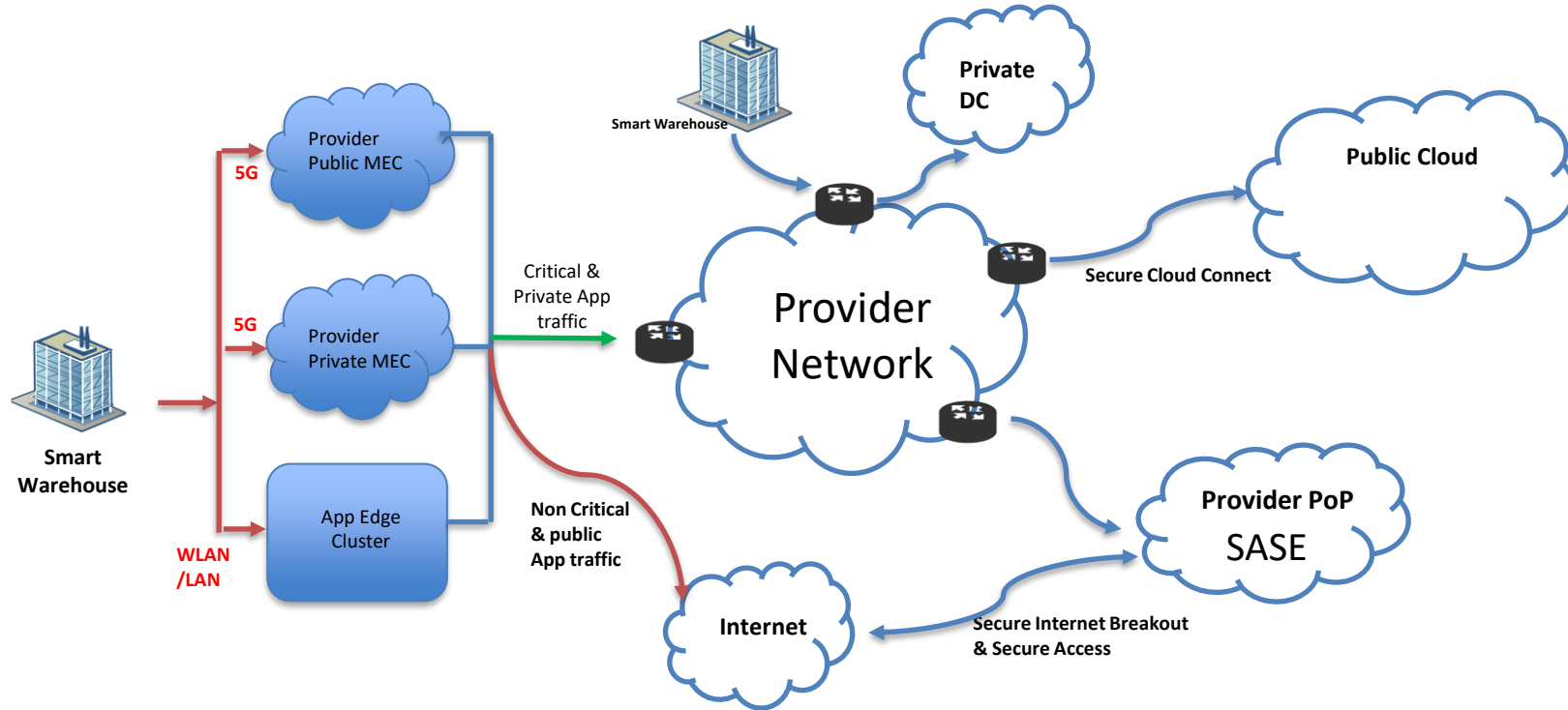
EMCO: Automated Routing to MEC Apps

Ravi Chunduru: Verizon

Sundar Nadathur, Srinu Addepalli: Intel

- Edge Computing Requirements (Ravi)
- 5G and MEC big picture (Srini)
- MEC Deployment Scenarios (Sundar)
 - Introduction
 - Variations

Enterprise Network Topology



MEC Apps are composite & distributed across and are to be securely connected

Requirements for Apps Connectivity

- Health Check & High Availability
- Latency sensitive Load Balancing
- Application Security
- Auto-updates to the Routes
- Support different flavors of Clusters
- Secure Inbound & Outbound Access to Apps
- Beyond Kubernetes based MEC Apps



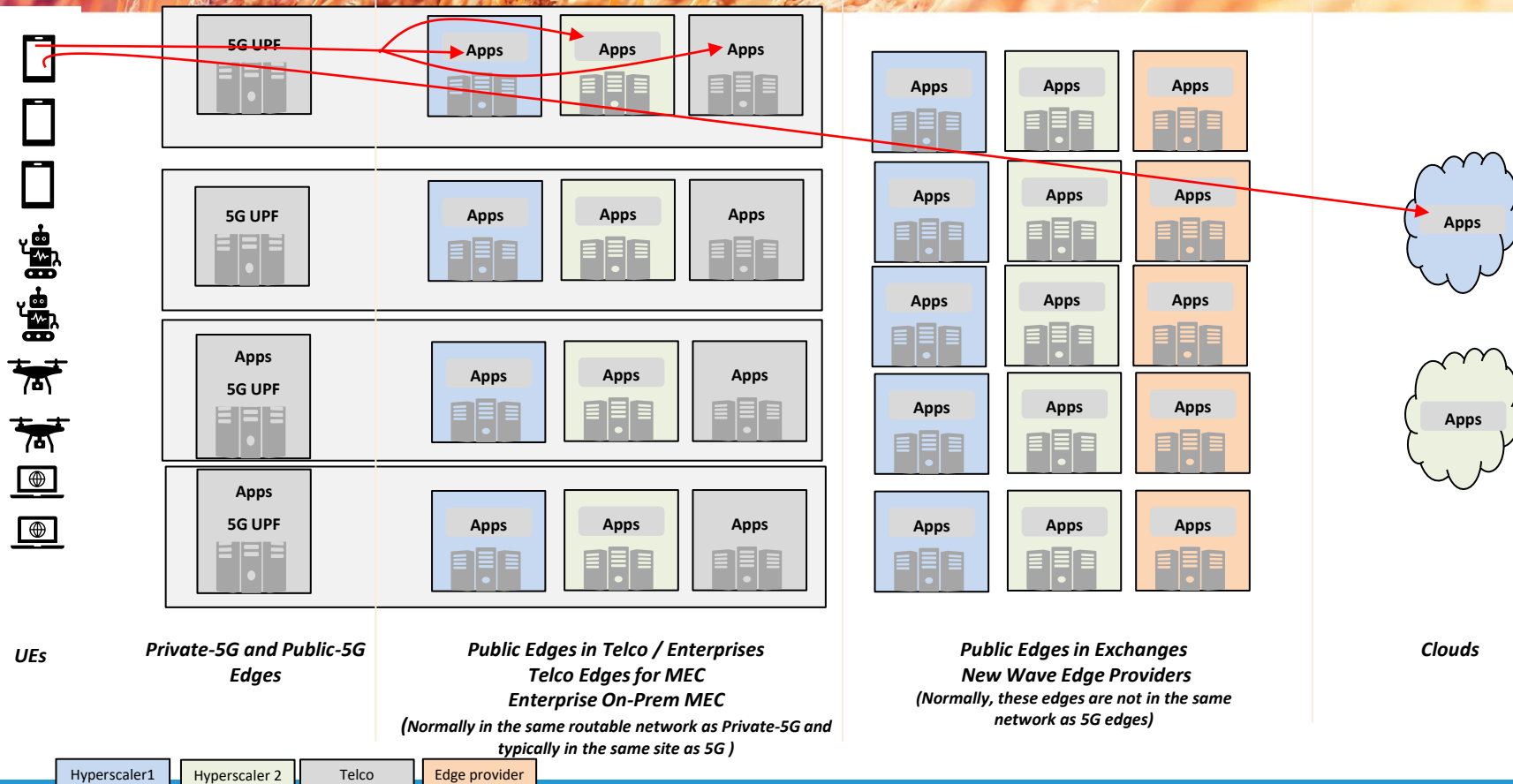
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MEC Deployment Scenarios

How EMCO can automate MEC networking

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5G and MEC big picture



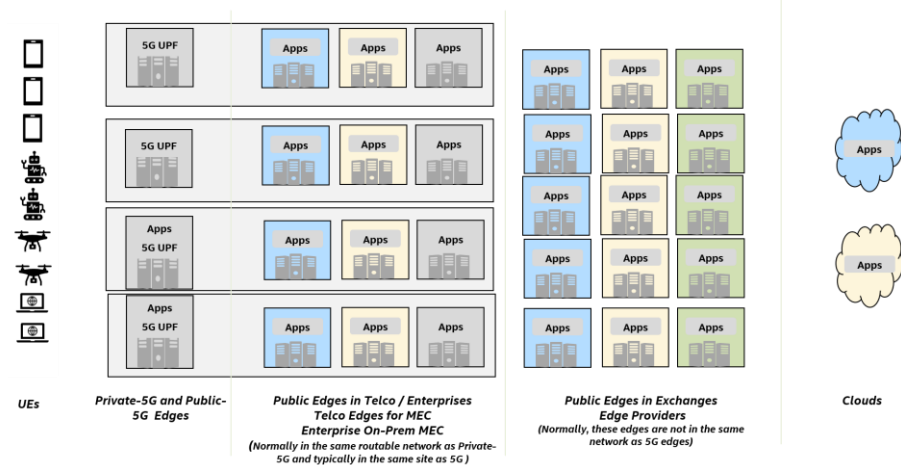
Enterprise (Developer) Challenges

Which Edges do I choose to deploy my applications to provide low-latency user experience to my users?

Which application instance to be mapped to a given UE session?

How do I ensure the secure connectivity and security of my application services from rogue users or compromised users?

How do I ensure that there is uniform connectivity even if I choose multiple edge/cloud providers?



Automation is the key

Find out the best possible edge locations to deploy applications

Automate deployment of application across these locations

Automate the connectivity and security across distributed apps

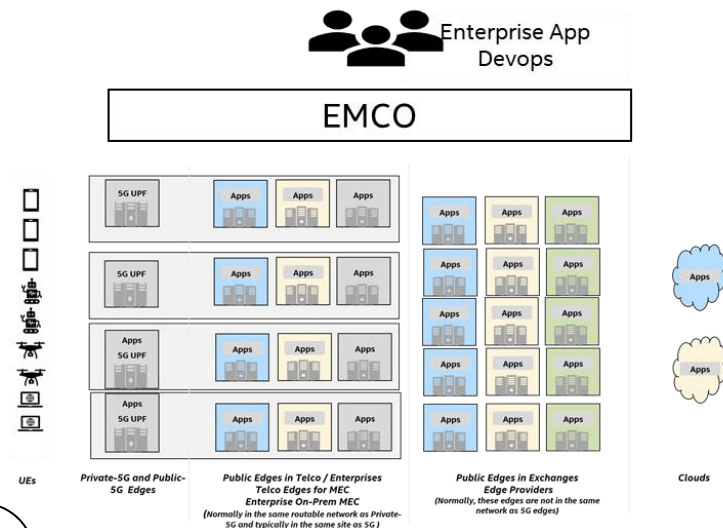
Automate the connectivity of frontend app to the UEs either via automation of DNS Servers, traffic steering from UPF and/or via UE session matching (EDGEAPP architecture) methods (Traffic routing automation)

EMCO is an enabler for this automation

- Placement decisions based on 5GFF API
- Deployment of frontend and backends of applications
- Automation of ISTIO to connect frontend and backends of applications

AND

Traffic routing automation (focus of today presentation)



EMCO Traffic Routing Automation Plan

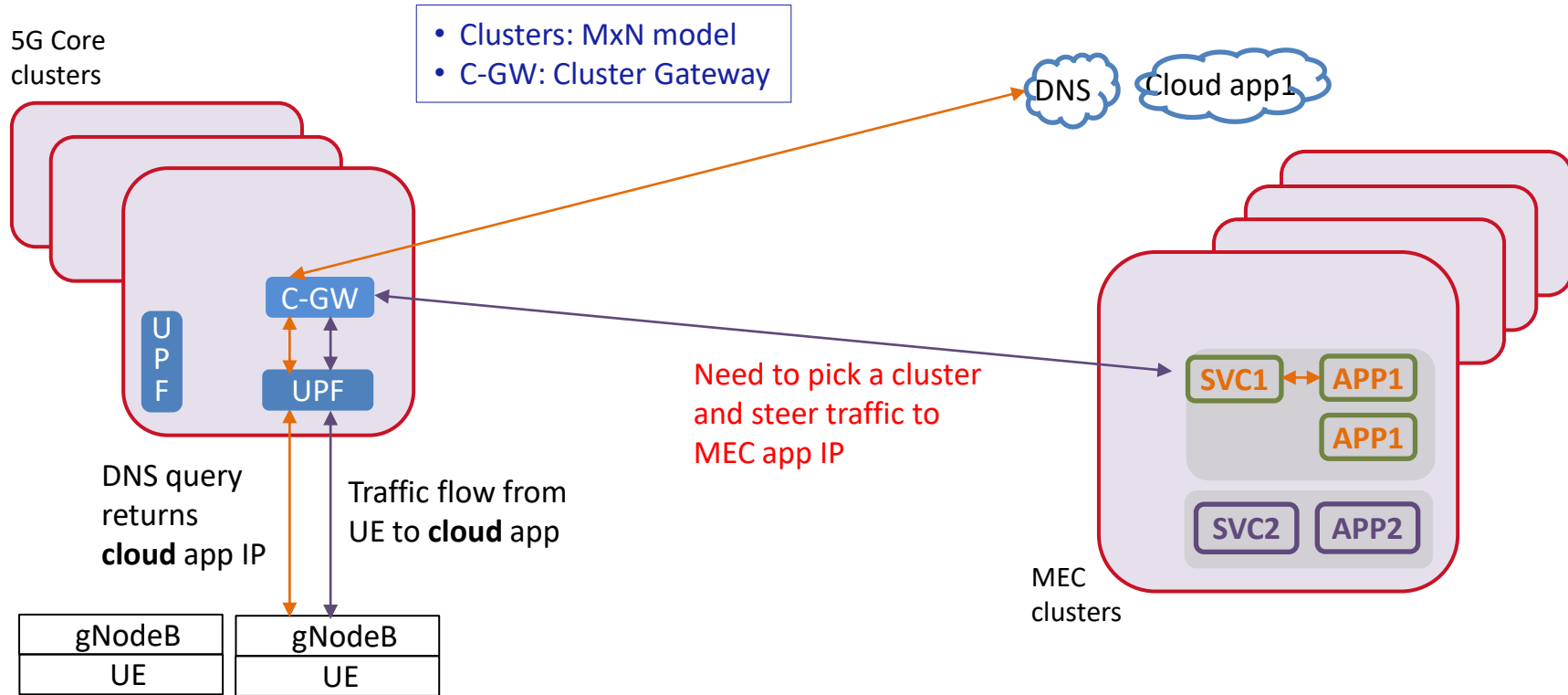
Phase	Type of MEC App	MEC App reachability	Service Mesh (ISTIO) in MEC clusters
Phase 1 App in the same cluster as UPF App in different cluster near UPF (1:1) between UPF cluster and MEC cluster	Copy of Cloud App Original	Direct	No Yes
Phase 2 : App in multiple MEC clusters (including local)	Copy of Cloud App Original	Direct Indirect via one IP across multiple clusters	No Yes
Phase 3 :App in multiple MEC clusters (including local) with security applied	Copy of Cloud App Original	Direct Indirect via one IP across multiple clusters Indirect via one IP for multiple Applications across multiple clusters	No Yes

EMCO Traffic Routing Automation Plan

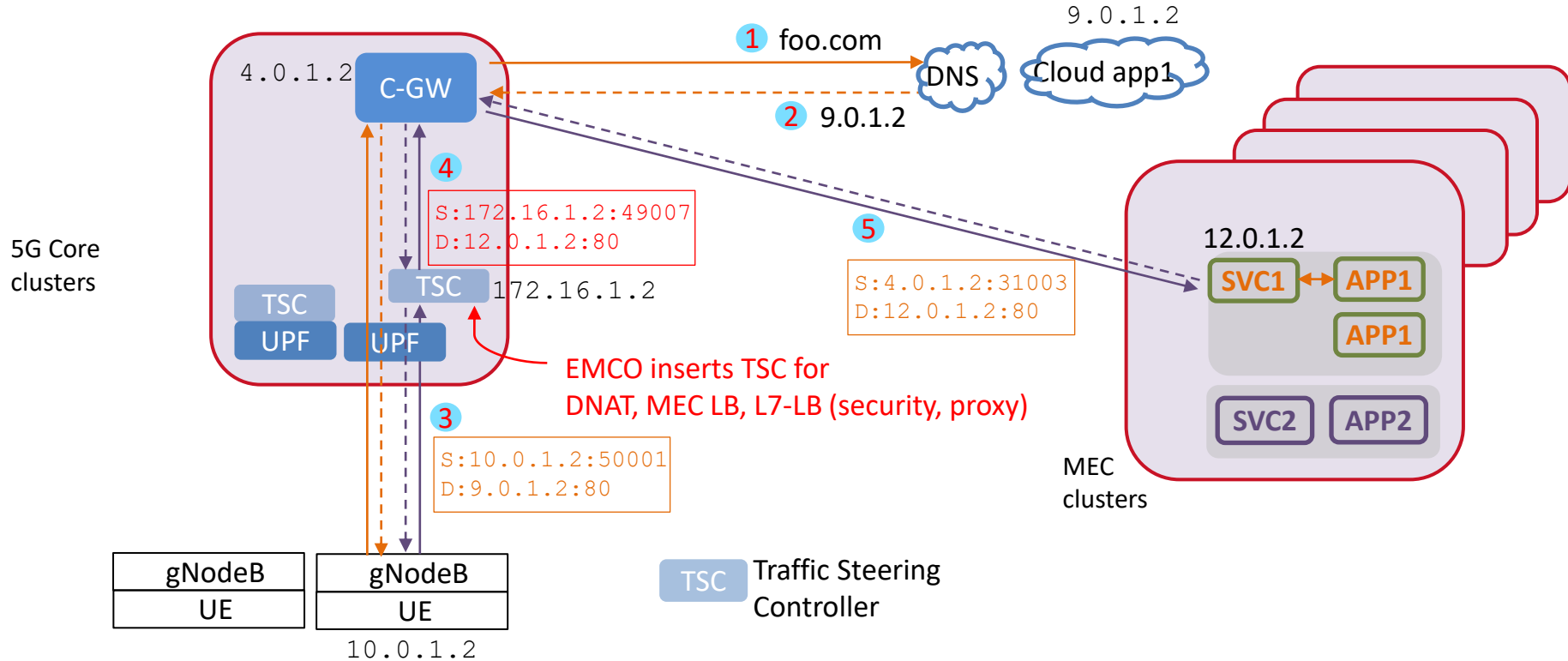
Phase	Type of MEC App	MEC App reachability	Service Mesh (ISTIO) in MEC clusters
Phase 4 : App in multiple MEC clusters (including local) with security + with selection of MEC cluster based on 5GFF based service.	Copy of Cloud App Original	Direct Indirect via one IP across multiple clusters Indirect via one IP for multiple Applications across multiple clusters	No Yes

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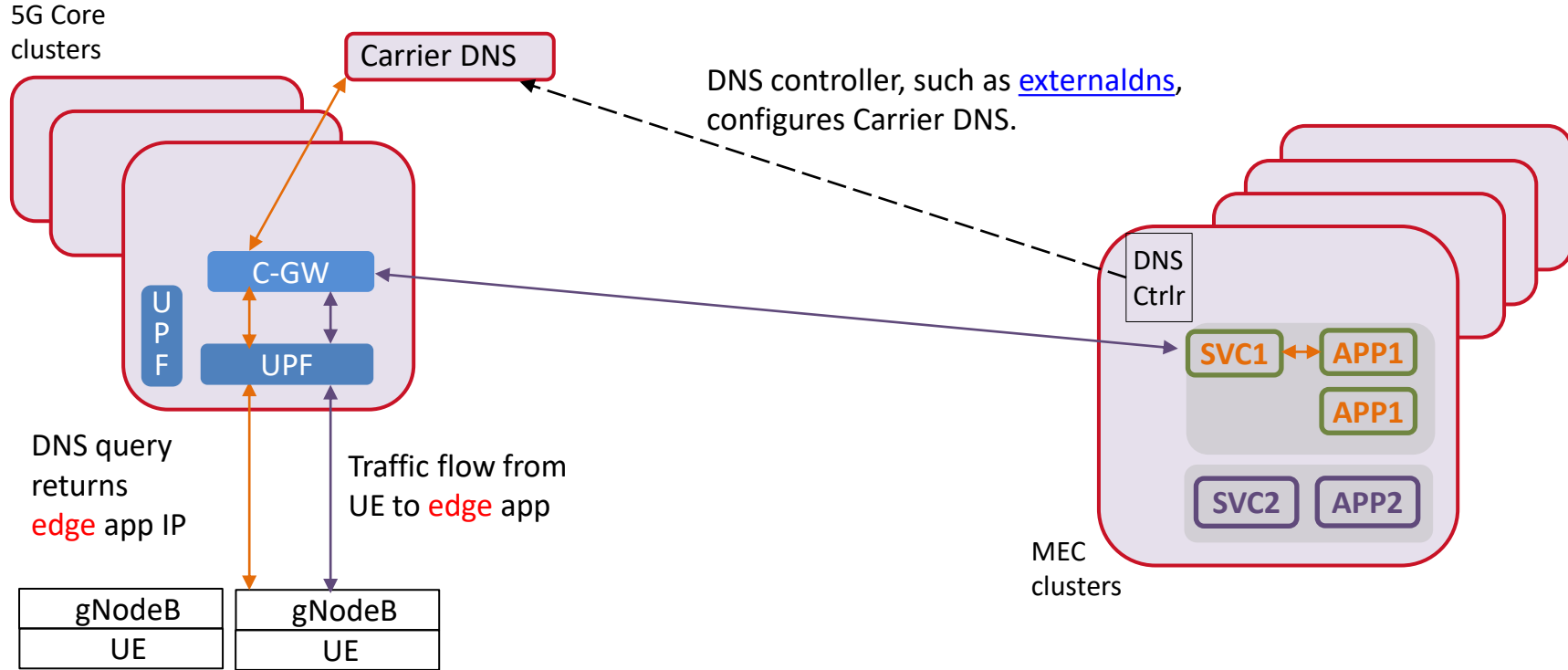
Scenario 1: Cloud App With Edge Instances



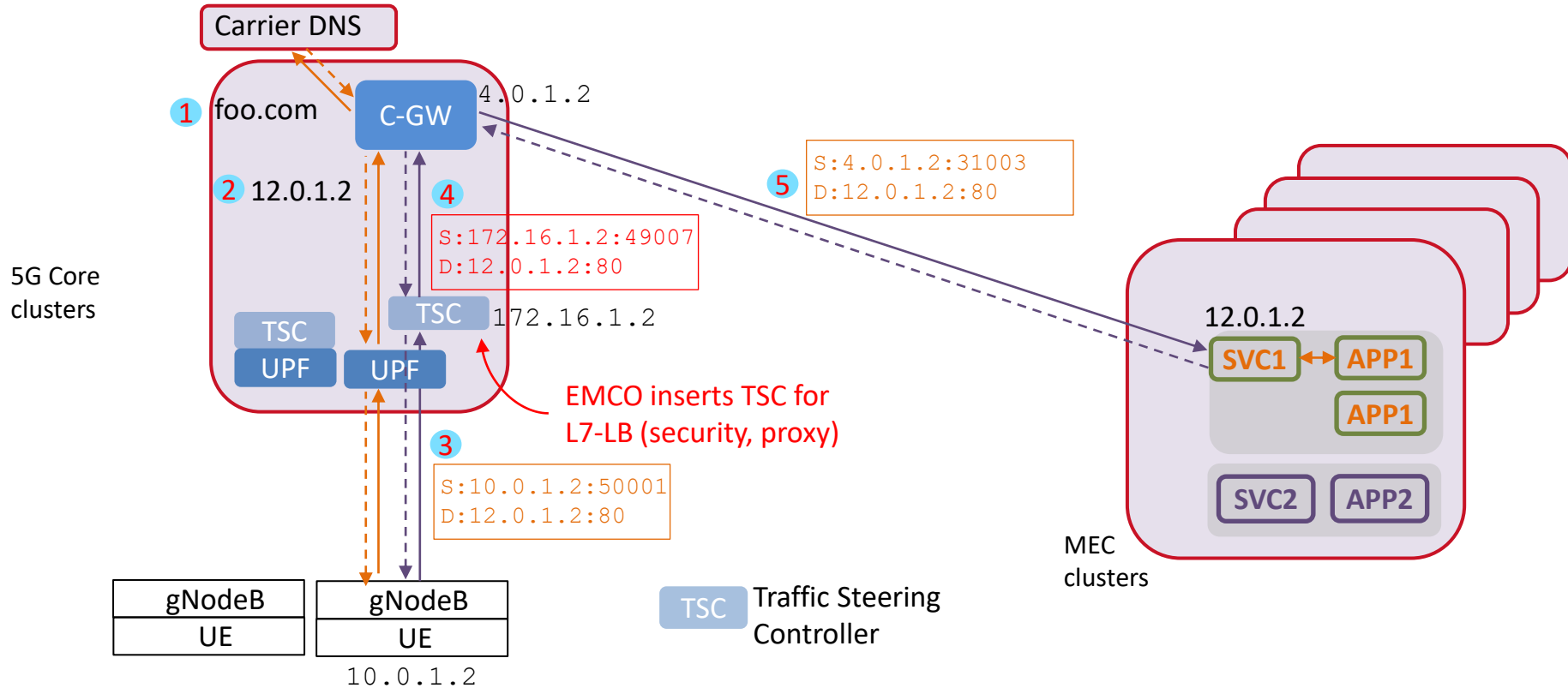
Scenario 1 Solution In Detail



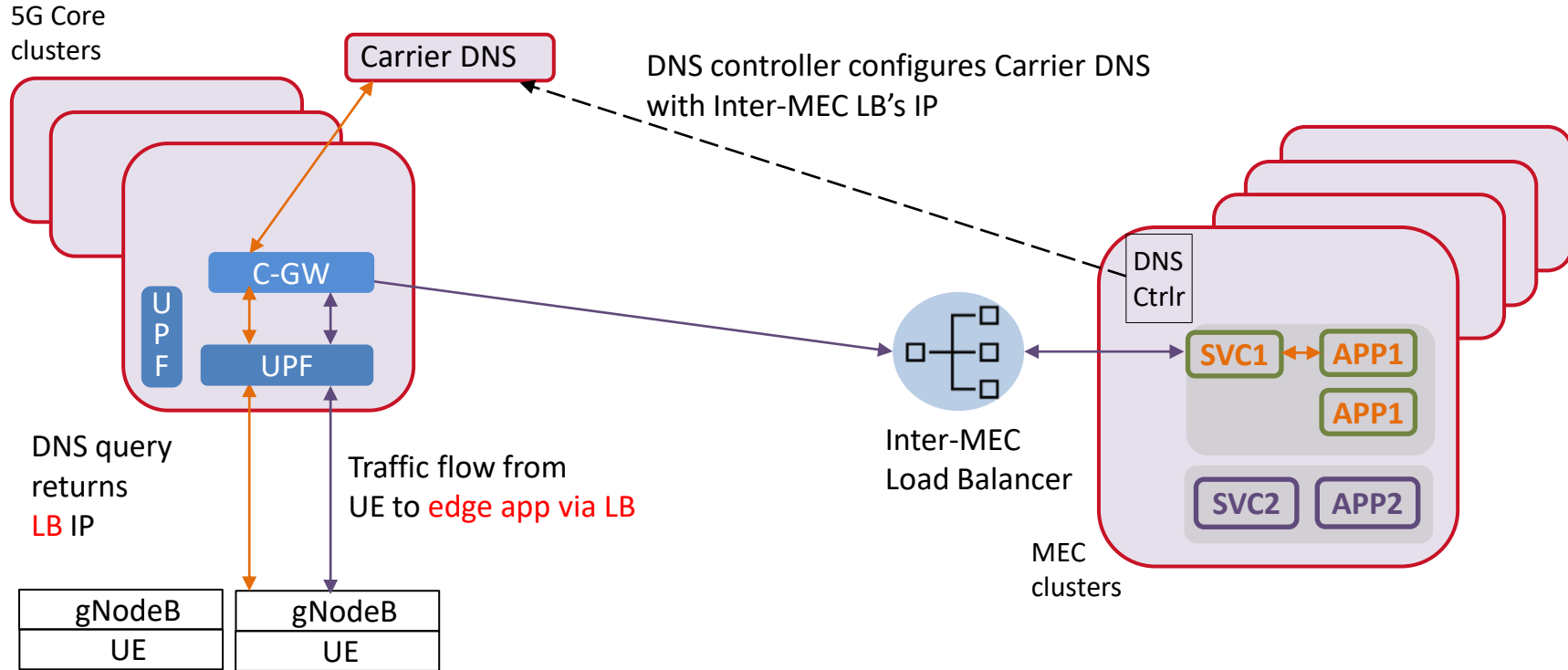
Scenario 2: Edge Apps Only



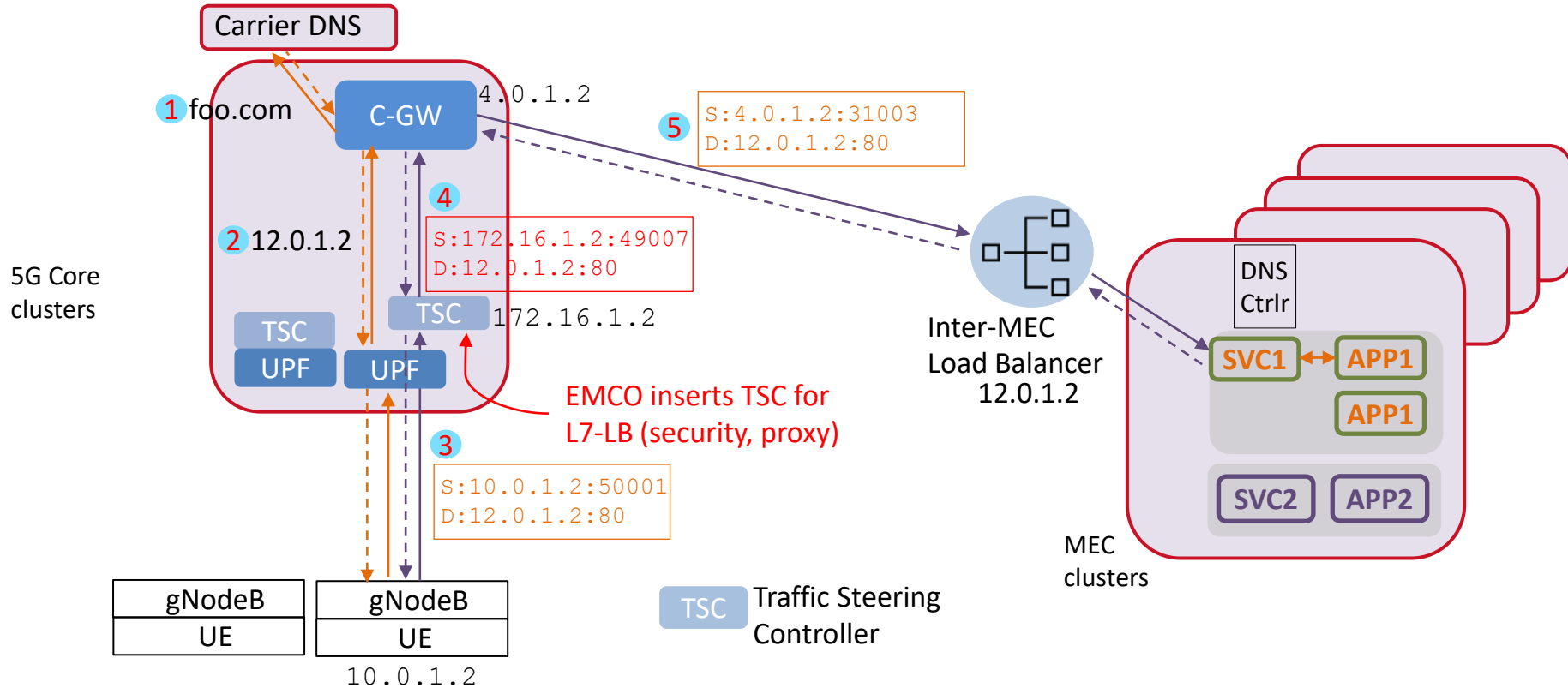
Scenario 2 Solution In Detail



Scenario 3: Edge Apps Only + Inter-MEC LB

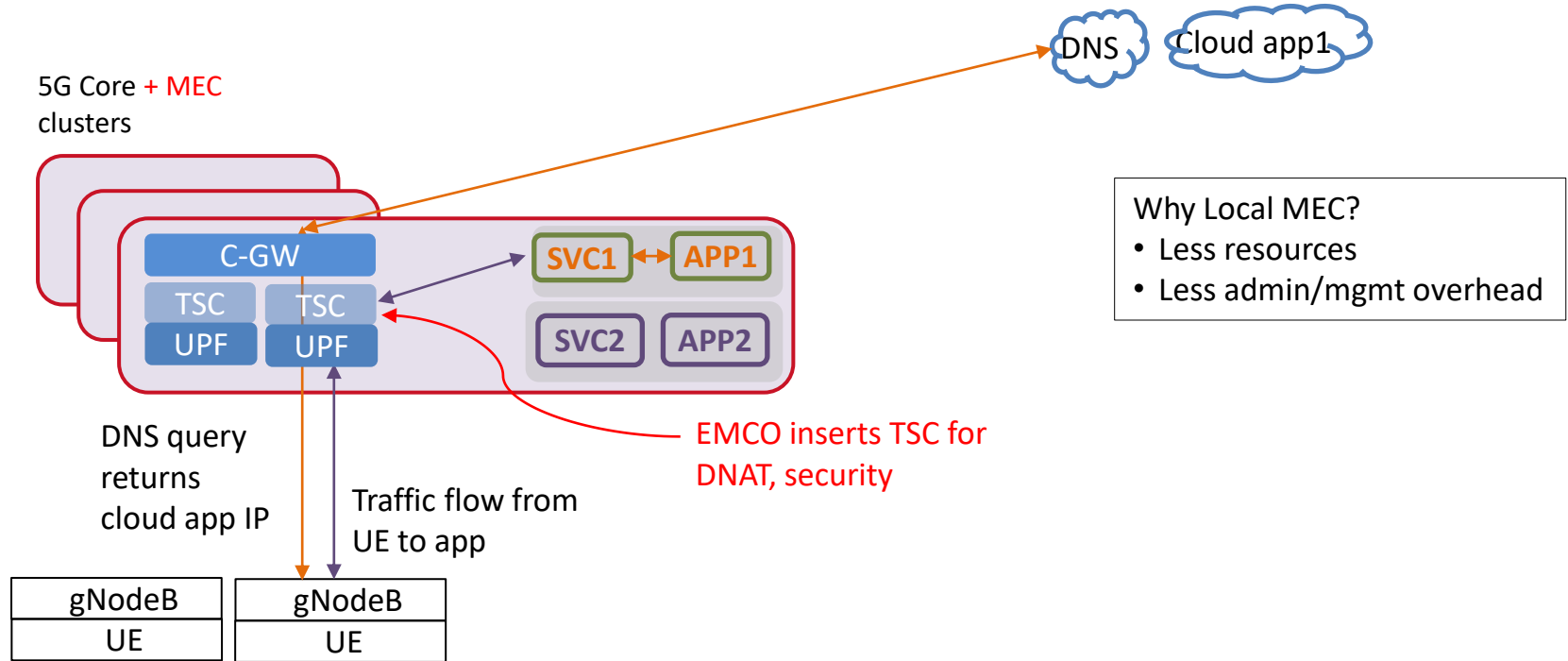


Scenario 3 Solution In Detail

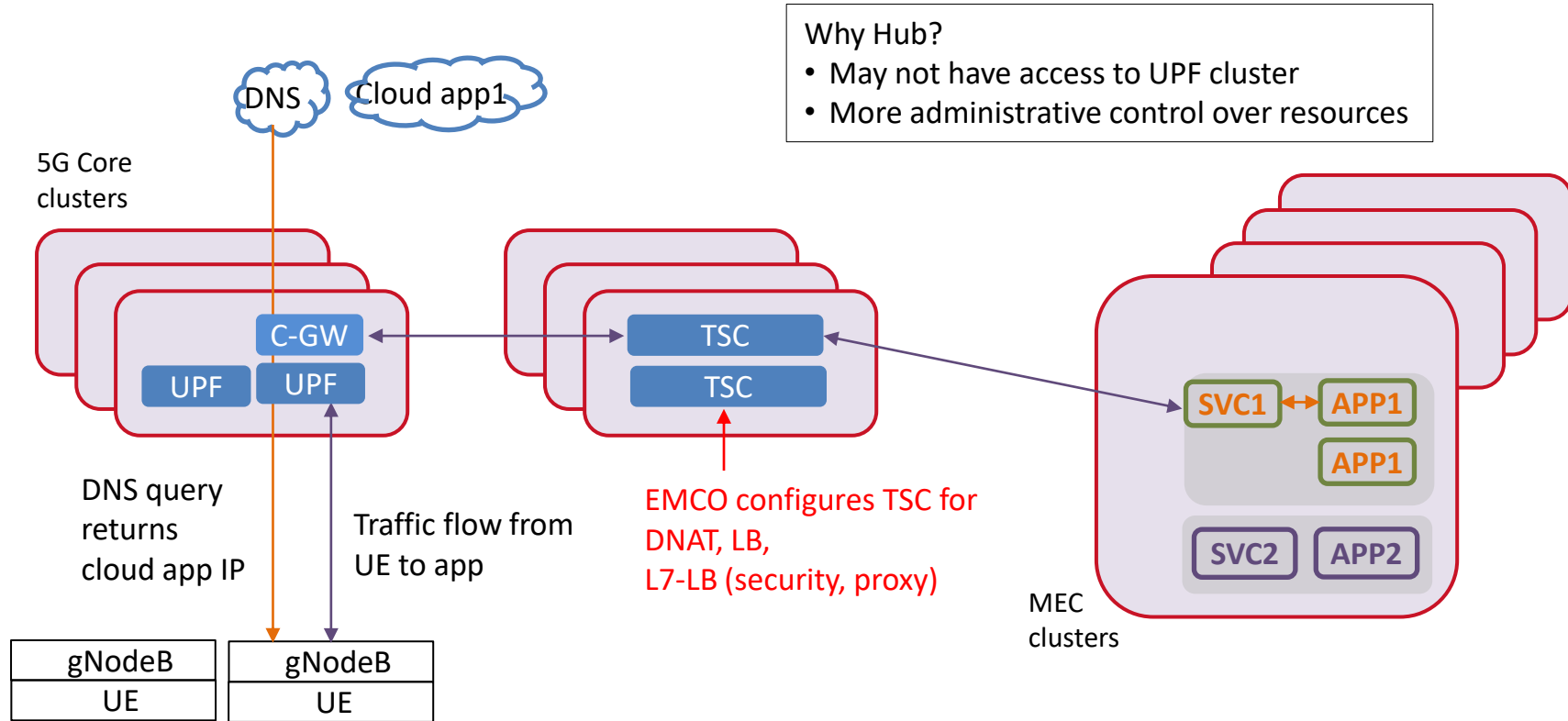


VARIATIONS

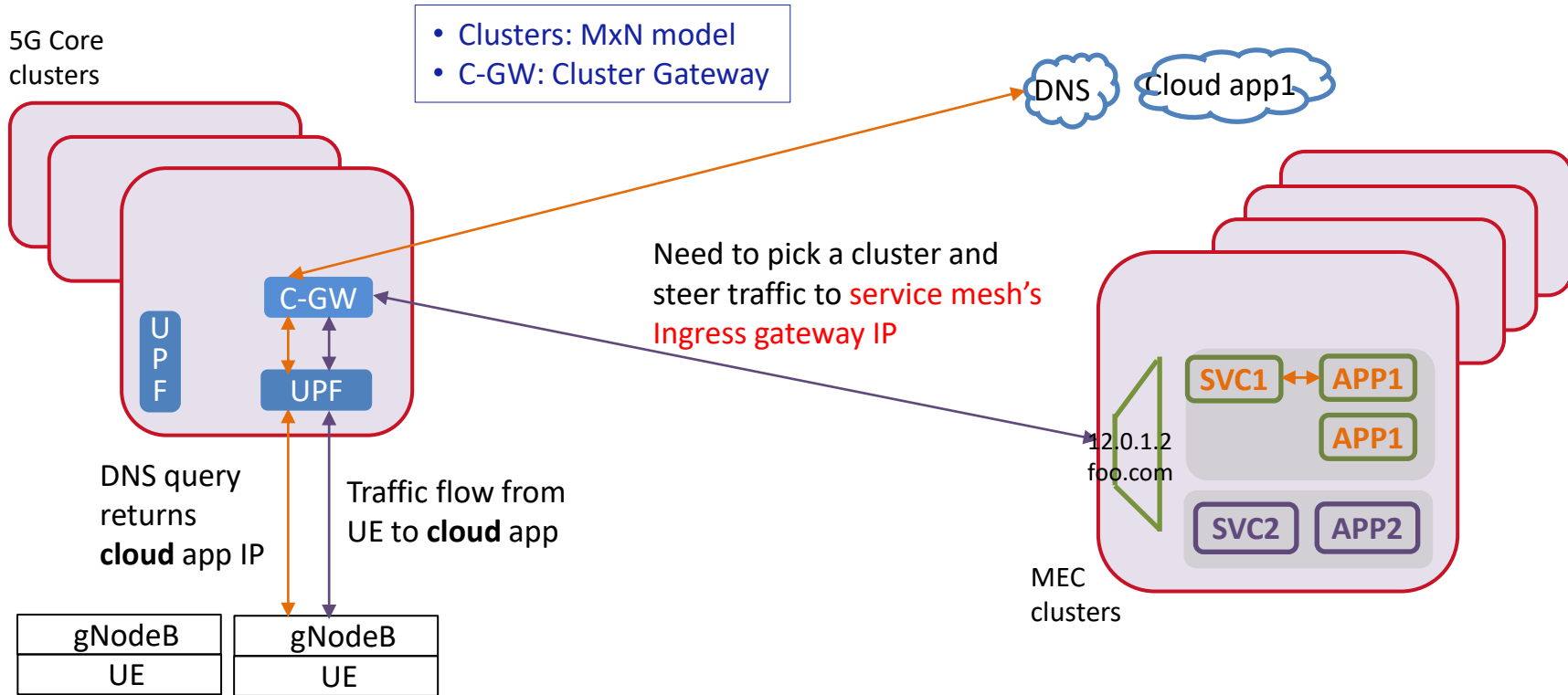
Variation 1 of Scenario 1: Local MEC



Variation 2 of Scenario 1: Hub


















Variation 3 of Scenario 1: Service Mesh



Matrix of Deployment Variations

Service mesh on/off in each phase; 5GFF API for MEC cluster selection in P4.

UPF cluster access for EMCO	Scenario	No L7-LB					L7-LB with Security		
		Local 1:1	Remote 1:1	Local M:N	Remote M:N	Hub M:N	Local M:N	Remote M:N	Hub M:N
Yes	Cloud app with edge apps	P1	P1	P2	P2	P2	P3	P3	P3
	Edge Apps Only	P1	P1	P2	P2	P2	P3	P3	P3
	Edge Apps Only + Inter-MEC LB		P2: L4 LB		P2: L4 LB	P2: L4 LB		P3	P3
No	Cloud app with edge apps		P4			P4			P4
	Edge Apps in Separate MEC clusters		P4			P4			P4
	Edge Apps with Inter-MEC LB		P4			P4			P4

Call To Action

- Questions?
- You are welcome to join us!

<https://lists.project-emco.io/g/emco-dev/topics>

The background is a solid blue color with several semi-transparent geometric shapes. In the top-left corner, there is a large square within a square. In the bottom-left, there is a cluster of overlapping squares of various shades of blue. In the bottom-right, there is a small cluster of squares, including one that is a lighter shade of blue.

Thank You