Use Cases-Standalone Service ID in Routing Network

draft-huang-rtgwg-us-standalone-sid-01

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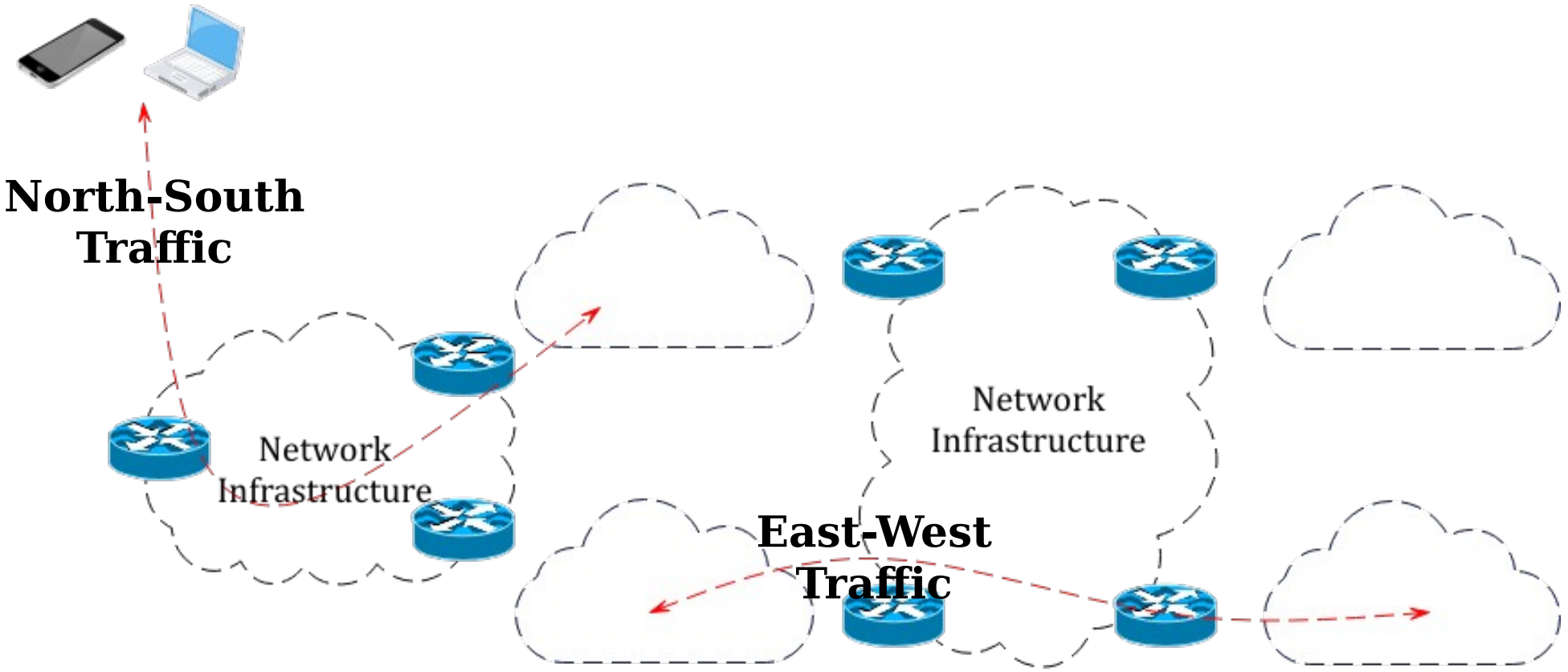
What's updated from IETF 118 & 119

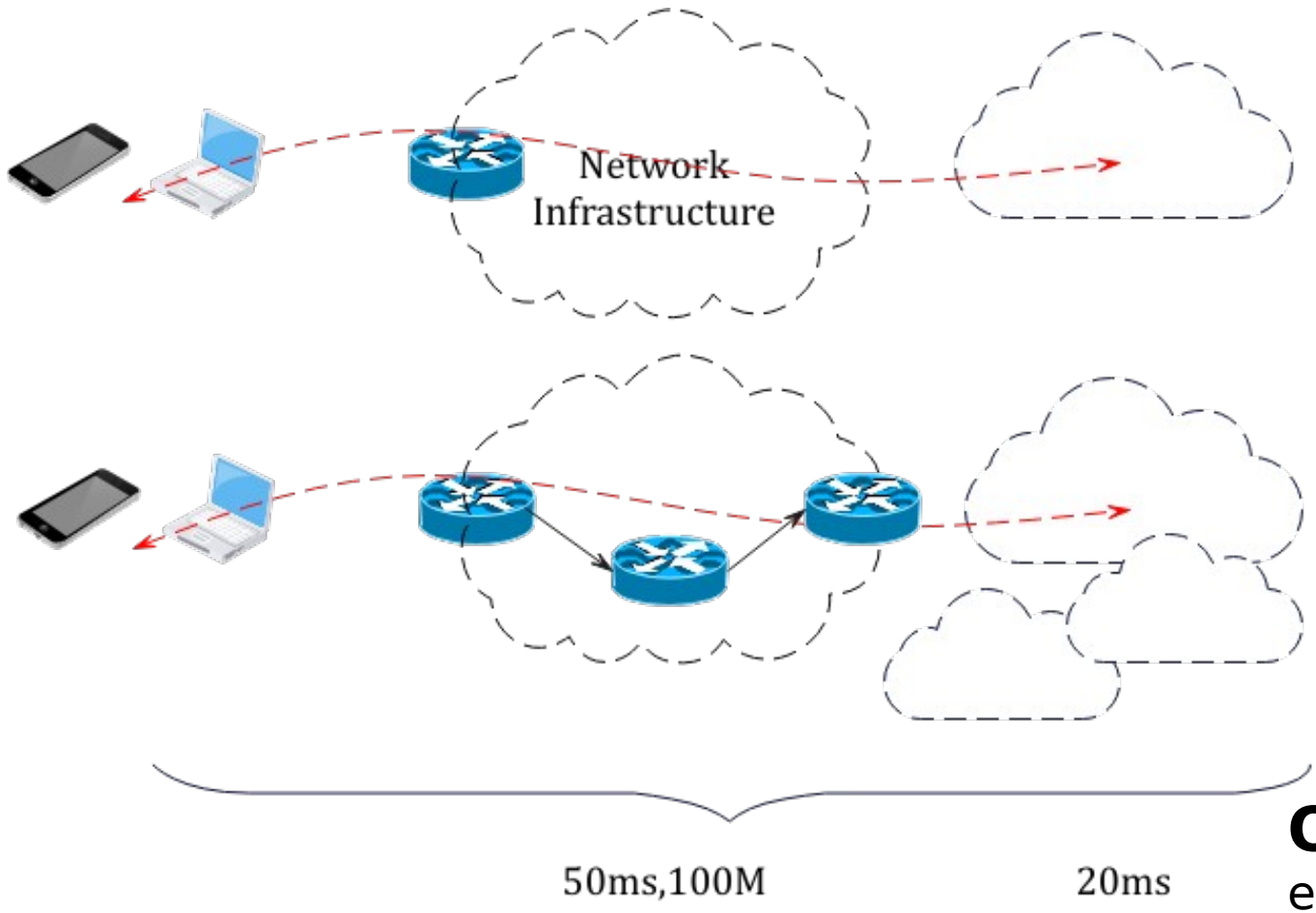
- Rolled back from the solution proposal of service ID for addressing and networking in IETF 118
- Focus upon the key use cases and requirements we've identifed and investigated

pps and service diversity, coordination among micro-service



Connectivity: **fine-grained beyond "Best effort"**
Scheduling: **coordination between networking and computing**
Observability: **service-oriented, whole-stack**

Gaps of south-north traffic scenario



Connectivity: Without explict interface between the service and the differentiated networking capabilities

Scheduling: The network steers traffic without service status, and the service delivers the traffic without network status, while actually both need to align with each other.

Observability : whole-stack and end2end view of the service performance could not be collected under existing mechanisms

Gateways and proxies in the way of east-west traffic

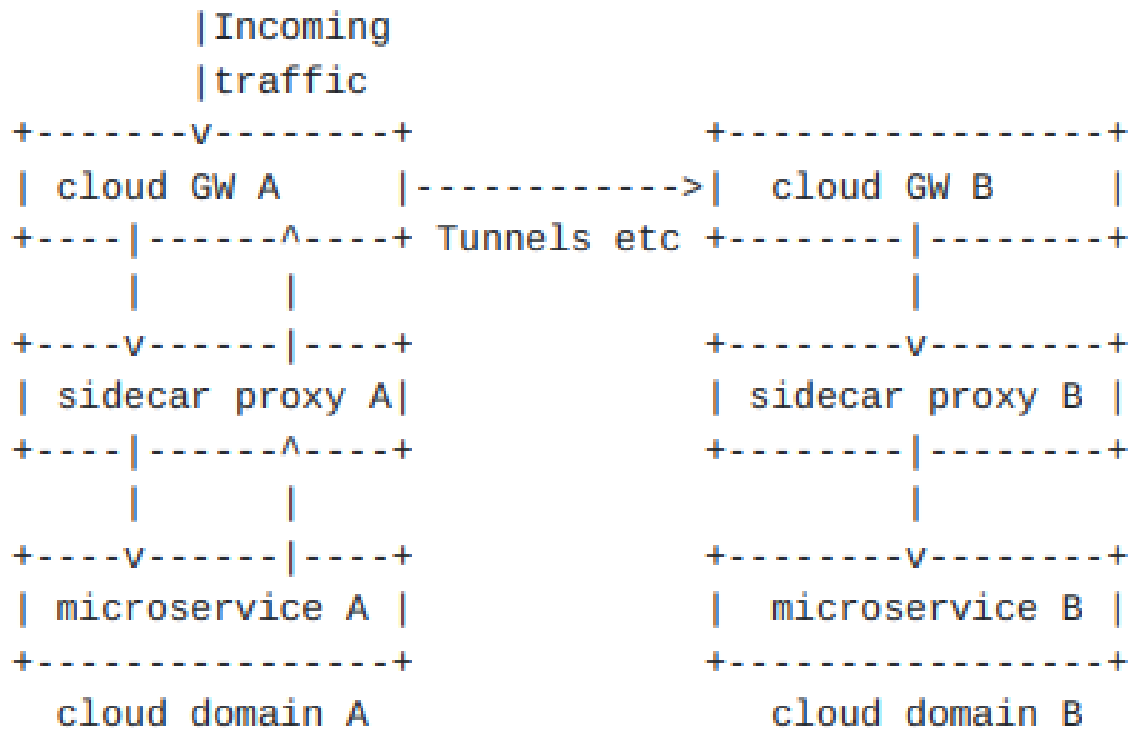


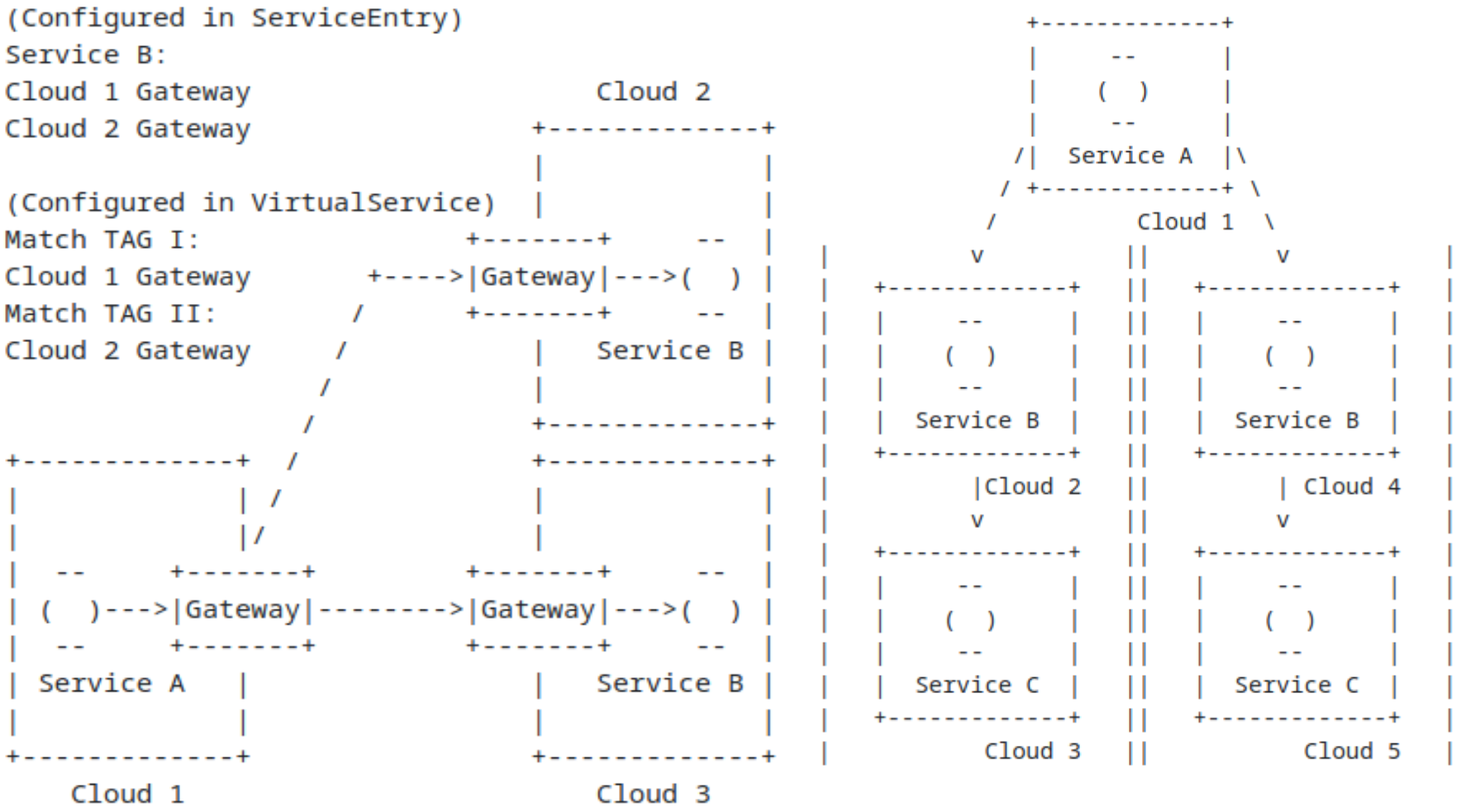
Figure 1: Inter-service communication within multi-domains

- a proxy intercept traffic and conduct processing
- application semantics are considered
- consists of three TCP segments

Additional processing delay at the gateways for each hop service-to-service communication
---> **Large end-to-end delay**

Interfaces are needed to establish appropriate mapping between different technologies in two adjacent domains
---> **High management complexity: a lot of static mapping configurations**

Cross registries and isolations from service interconnection

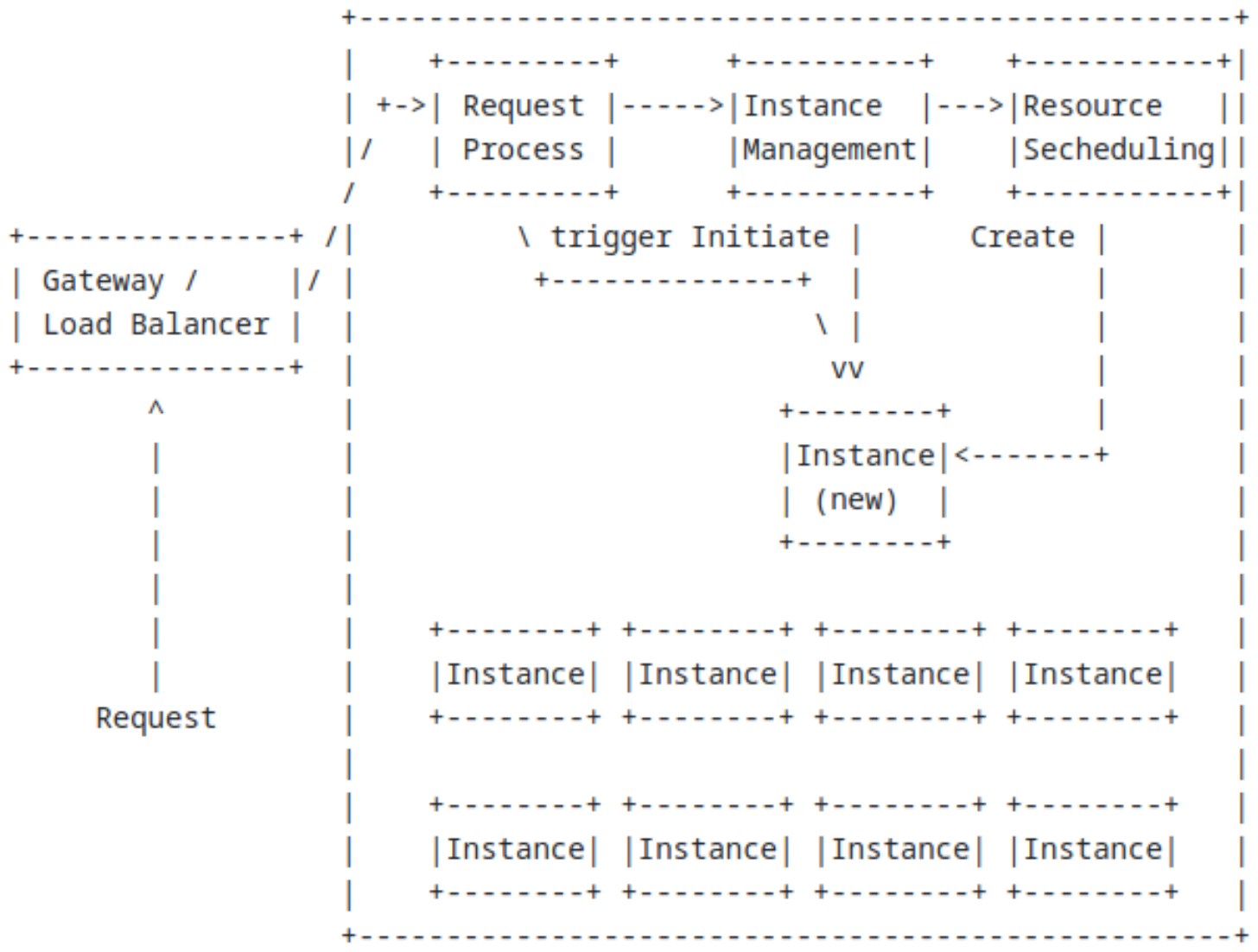


3. Collaborative logic across microservices and endpoints is not perceived and maintained by infrastructure.

1. Static configs for both service discovery and scheduling policies

2. The service endpoints are not aware of the resources and circumstances of network

nited resources and burdening configs in edge site scheduli



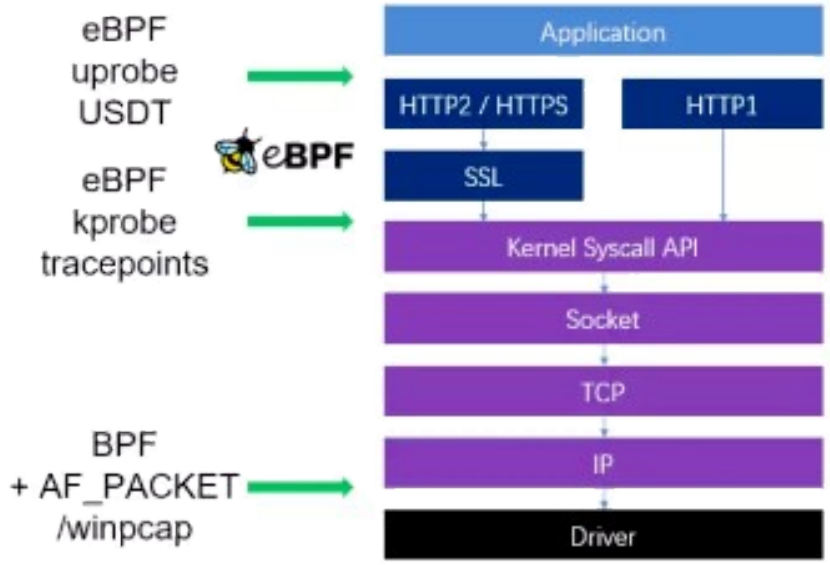
1. End systems and edge sites initiate the service request without whole picture status of the remote sites. The status gap matters significantly in the case of serverless.

2. Difficulties and burdens in managing instances with dynamic scaling conditions in control plane.

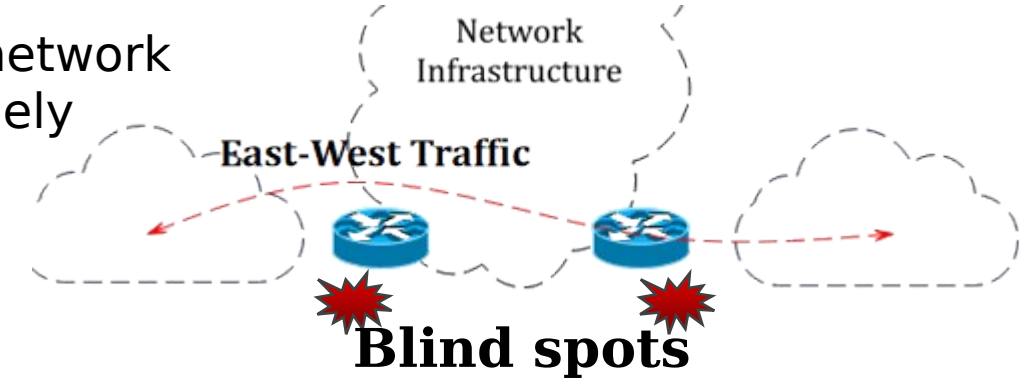
Blind spots in APM and eBPF

Enhanced Berkeley Packet Filter (eBPF) technologies

- the byte streams collected by the eBPF technologies pertains to process and thread, and it is difficult to associate with the services and applications.
- Unable to correlate the failure in the underlay network with the overlay tunnel and take action in a timely manner.



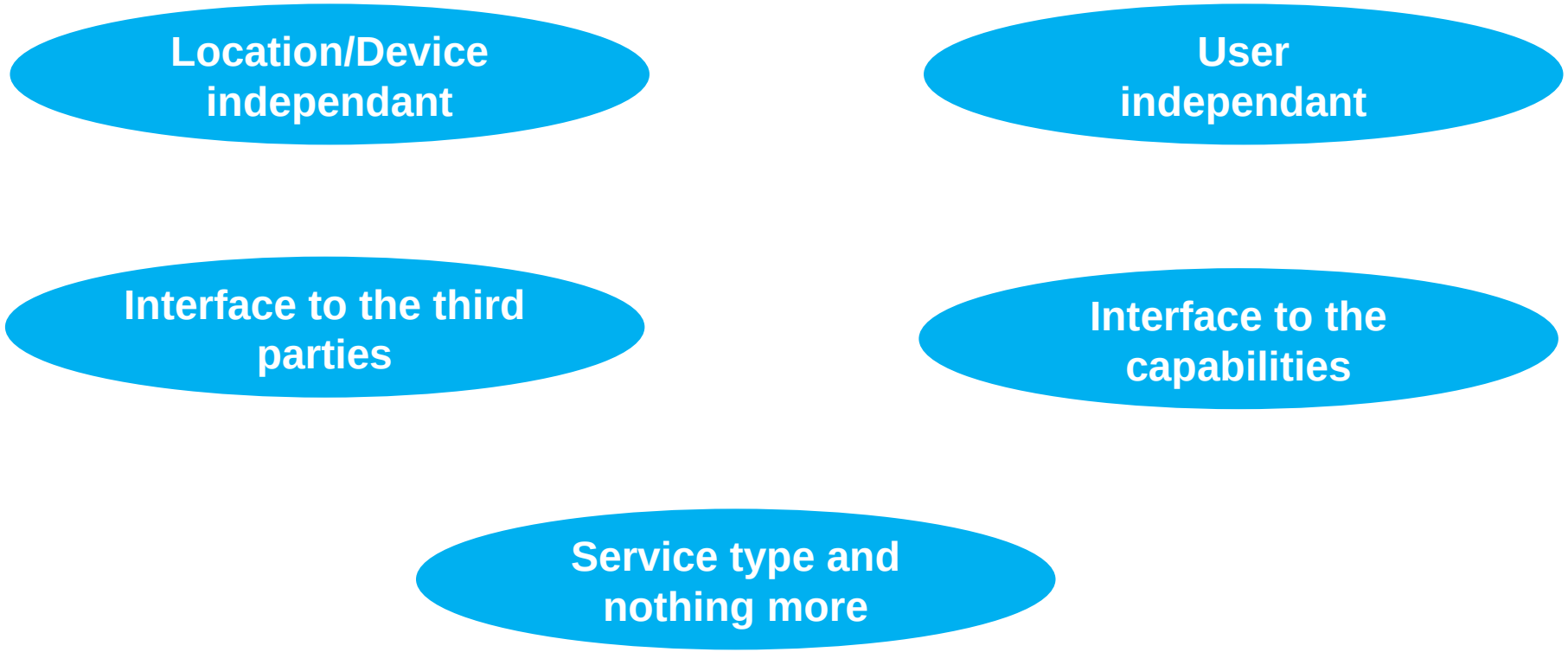
source: https://deepflow.io/blog/039-qcon-2022-in-depth-practice-of-cloud-native-observability-based-on-ebpf/



Application Performance Management (APM)

- When it comes to different scheduling polices with regard to either networking or services , APM is either not allowed or leads to maintenance difficulties such as conflicts of codes
- Unable to obtain measurements regarding the infrastructure such as system calls and network transmissions

Requirements of standalone service ID in routing network



Terminology: we do not believe “service ID” is the best and it remains open for better suggestions.

Next Steps

- Refine the drafts upon comments and suggestions.
- More comments, suggestions and contributions would be welcome.

Side Meeting this evening

17:30-19:00 Tennyson MONDAY 22 July
Standalone Service ID in Routing Network

Standalone Service ID in Routing Network: Usecases, Problems and Requirements and Preliminary Solutions

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