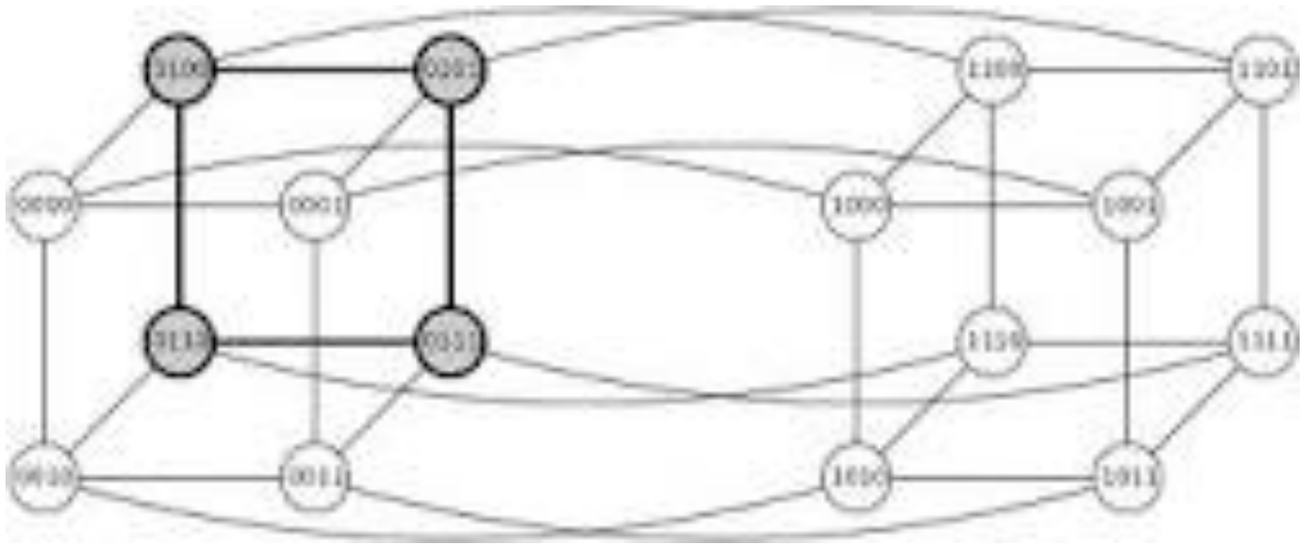


LISP Based FlowMapping for Scaling Virtualized Network Functions

rfc-draft-overview

Sharon Barkai, Dino Farinacci, David Meyer, Fabio Maino, Vina Ermagan

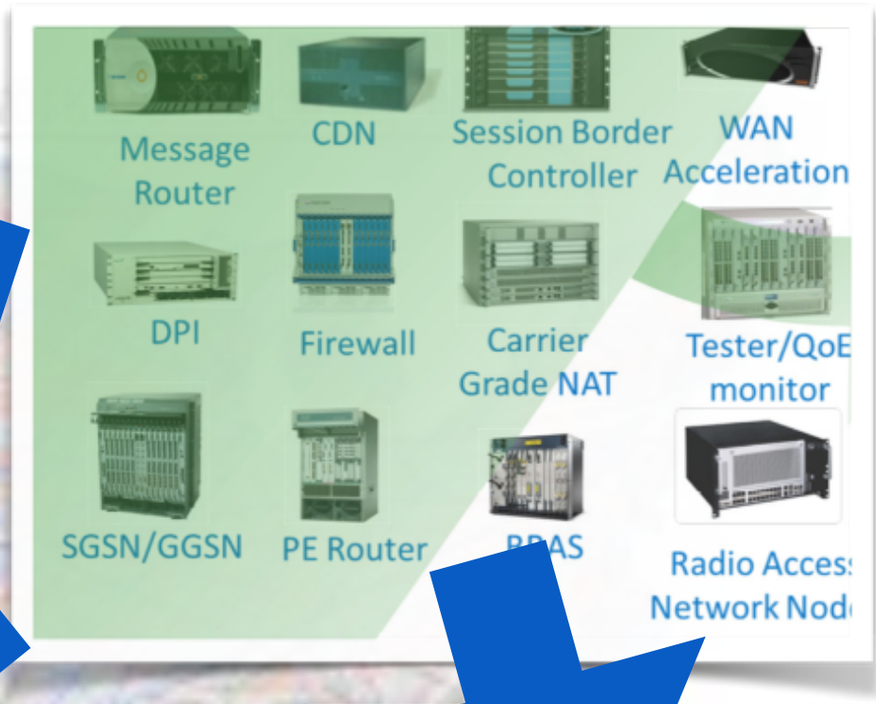
Network Function Virtualization

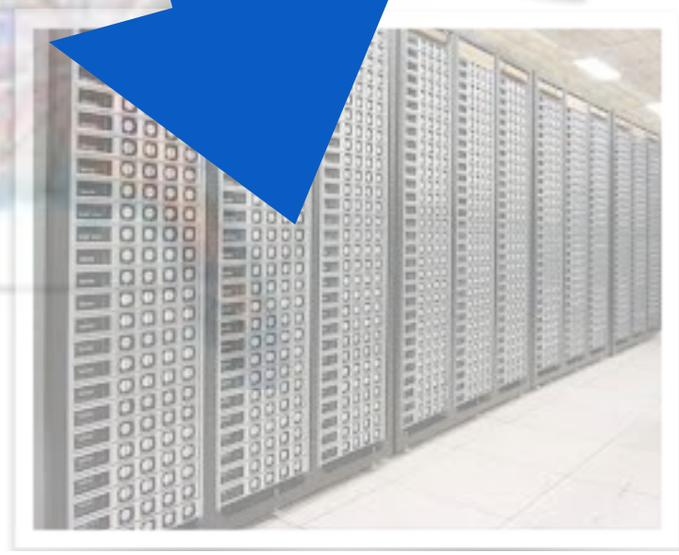
- Key goal - turn carrier points of presence into (mostly) data-centers of network functions

- Subscriber Management, IP Multimedia, Content Distribution .. as software on servers

- Dynamic elastic resource allocation,cuts costs, increases utilization, promotes innovation

Network Functions



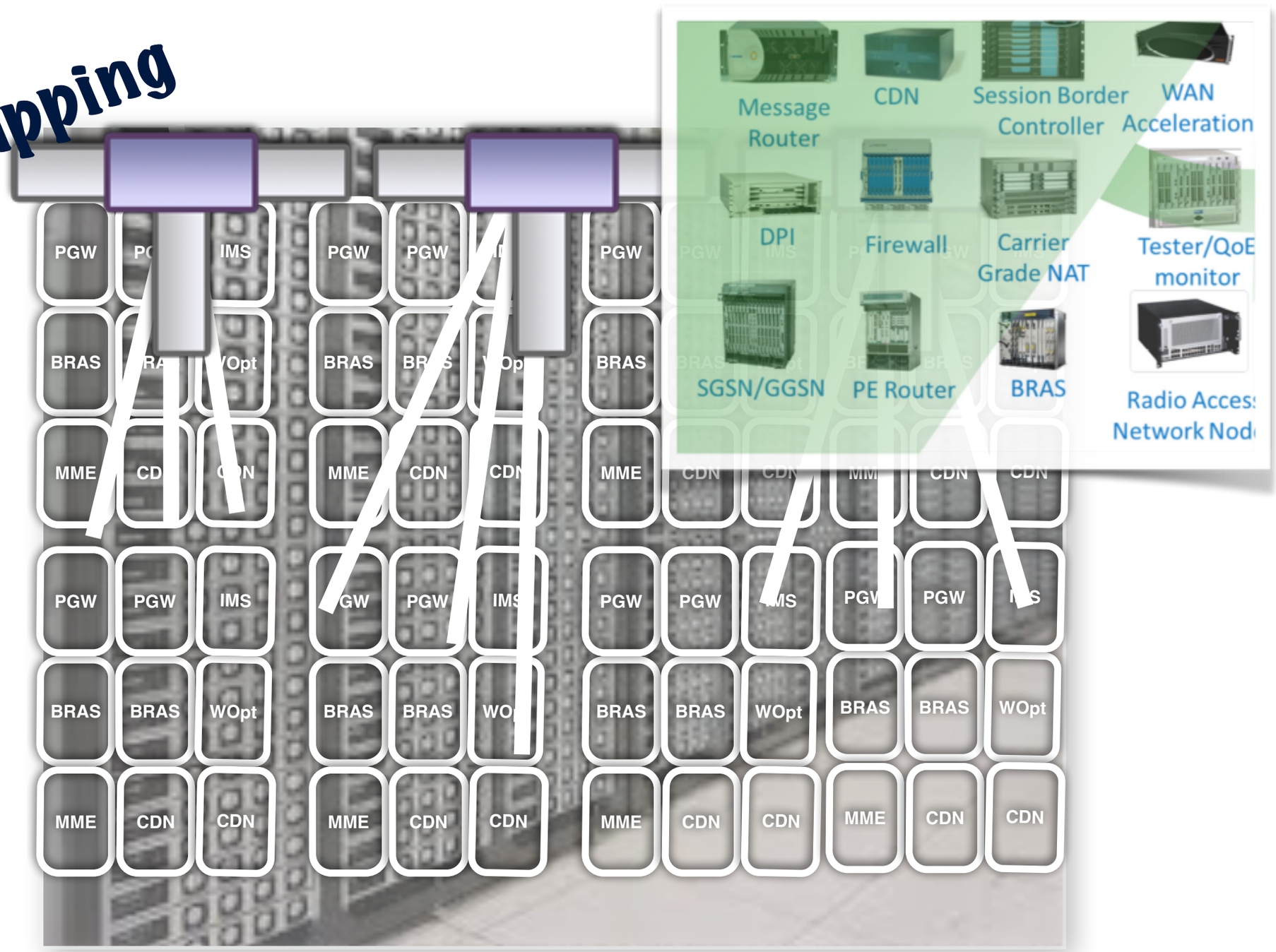


Standards Based Software on Standard Hardware

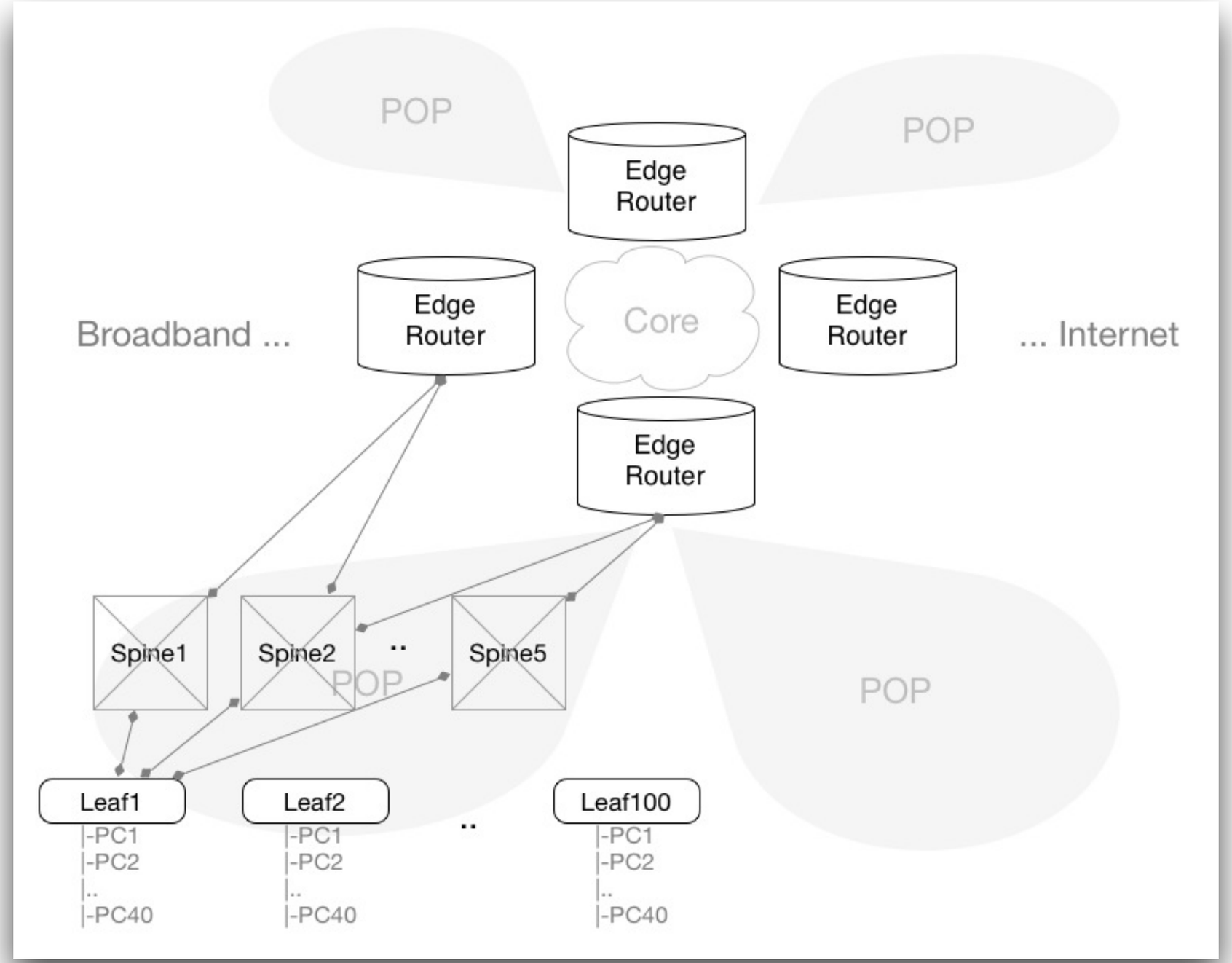
Subscriber-managment-mobility-quality Application-content-signaling-cores

Calling the Functions

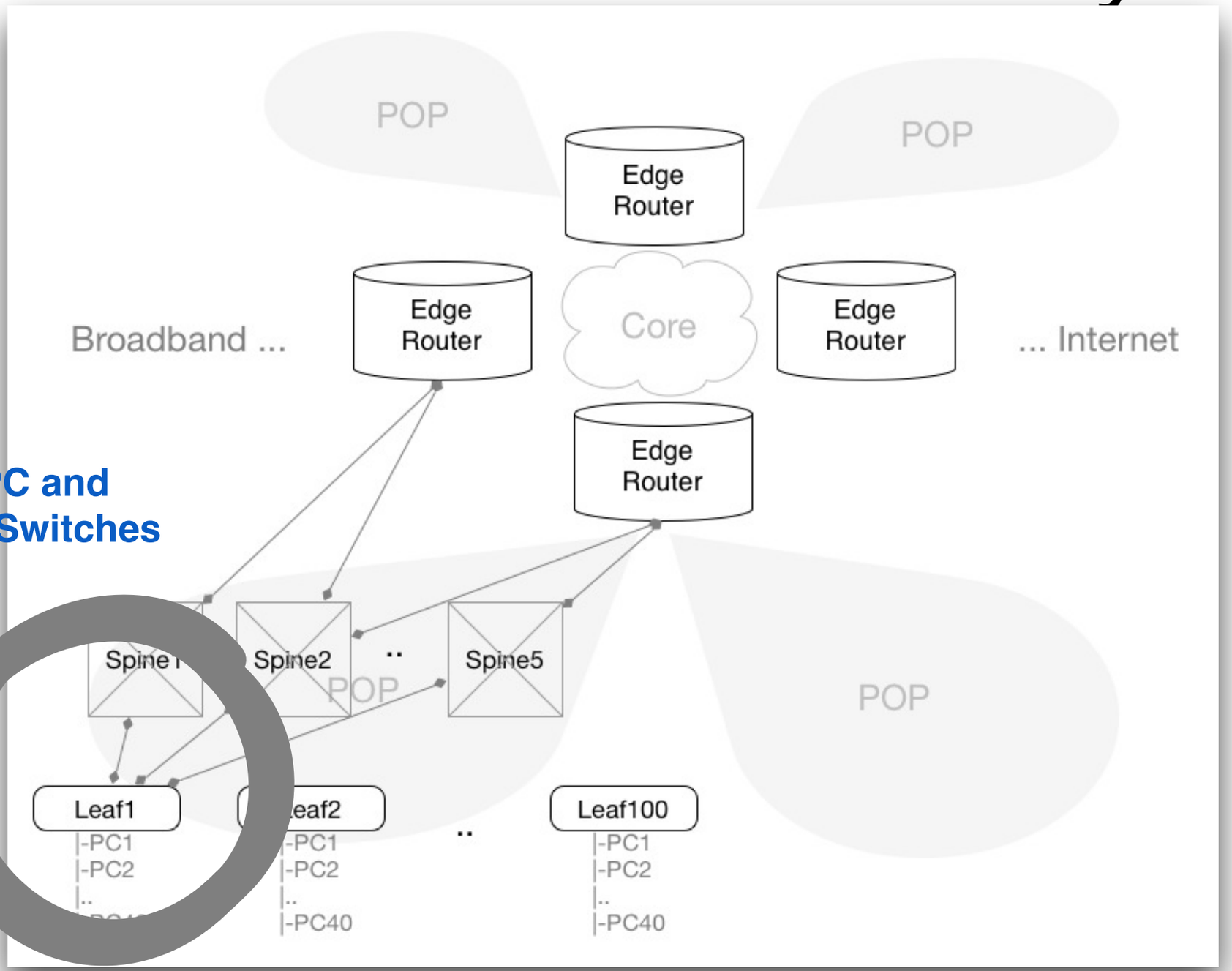
Flow Mapping



Topological Network Basis



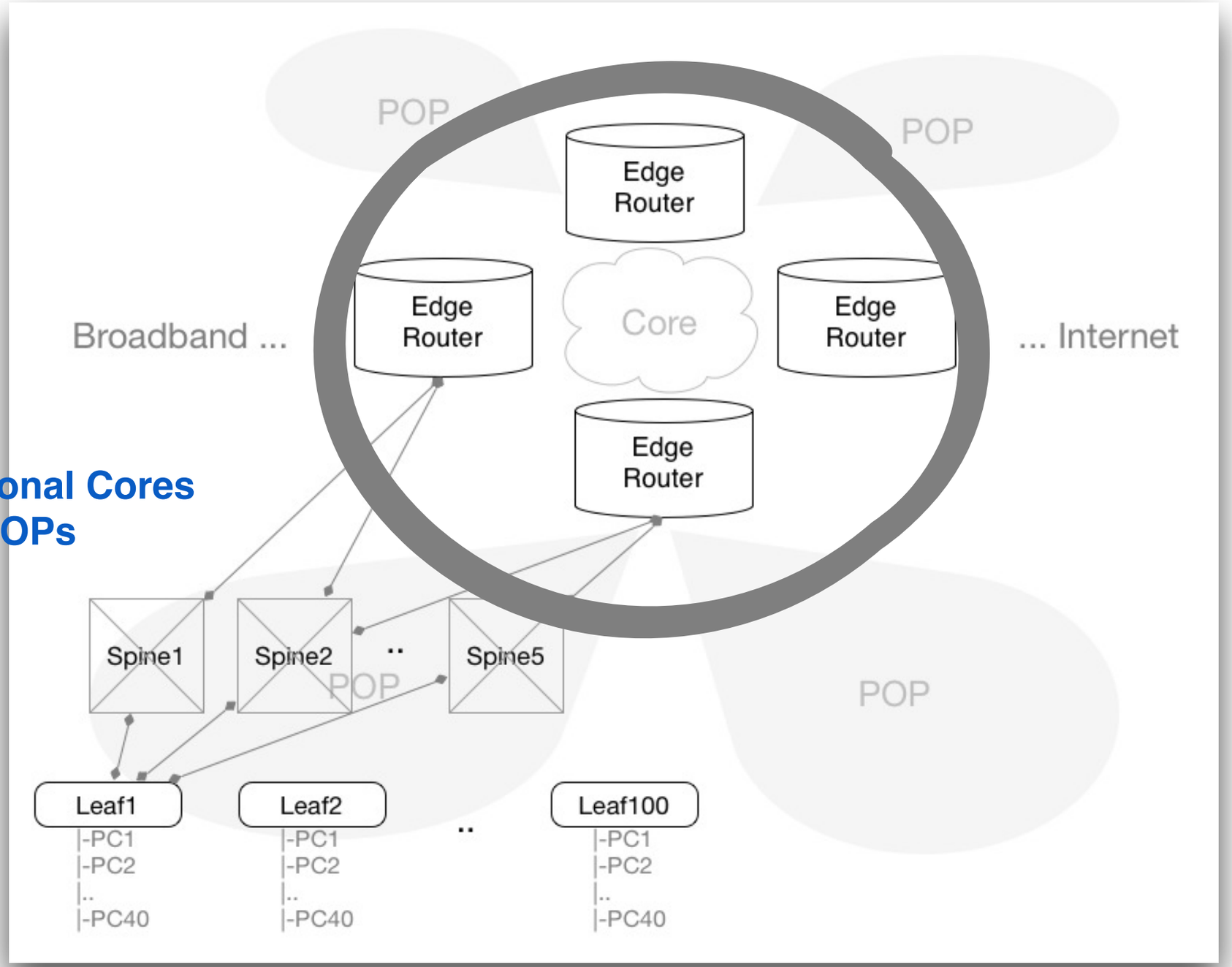
LISP-NFV: Mobile Optimizations & Analytics



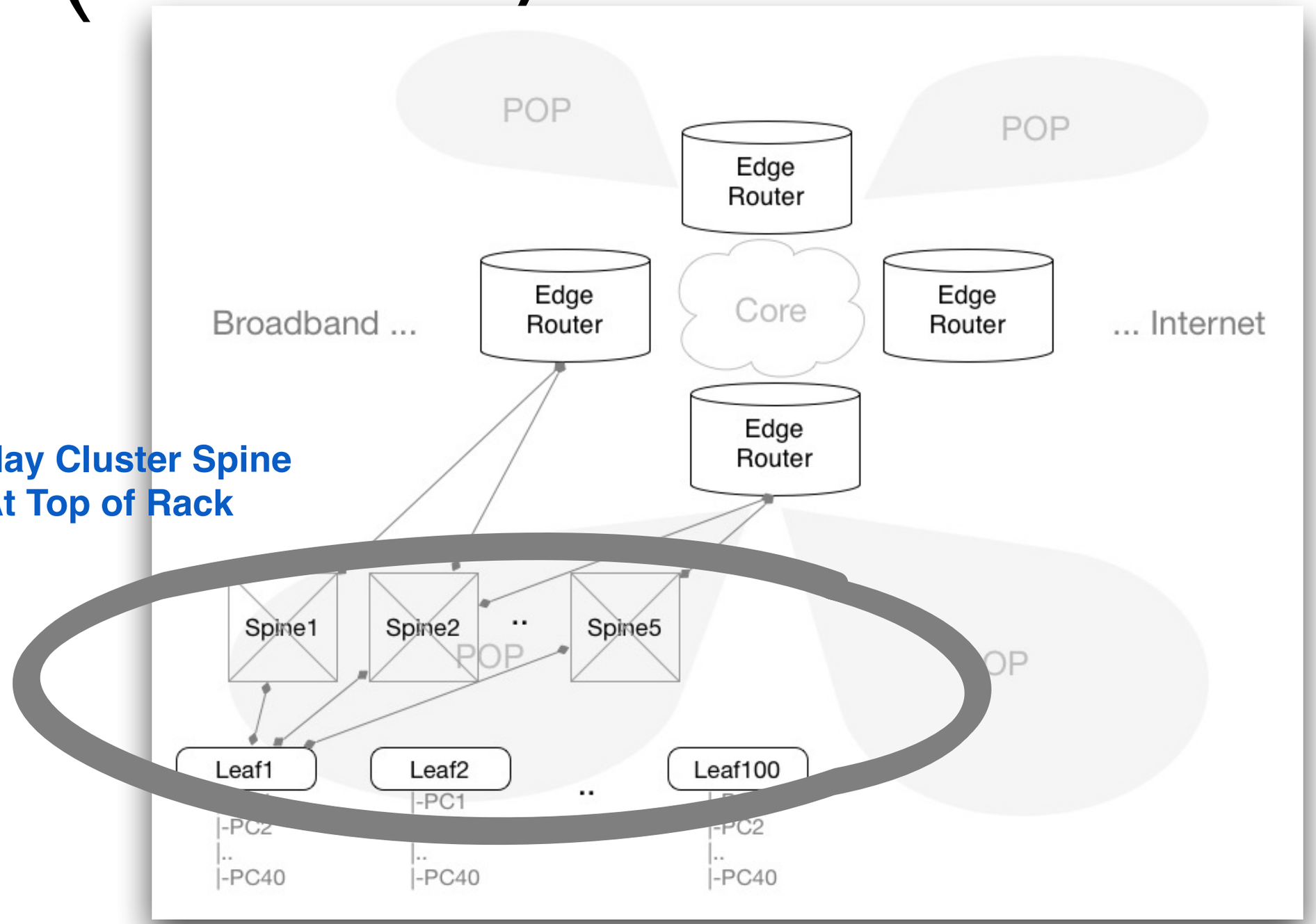
Overlay EPC and BladeServer Switches

LISP-NFV: IP Media & Content Distribution

Overlay National Cores In A-POPs



LISP-NFV: Elastic (mobile) Core Network



Overlay Cluster Spine At Top of Rack

Functional Matrix

Recursive

vFunctionA Instance1..i

vFunctionB ... Instance1..j

vFunctionN Instance1..k

SubsFlow1

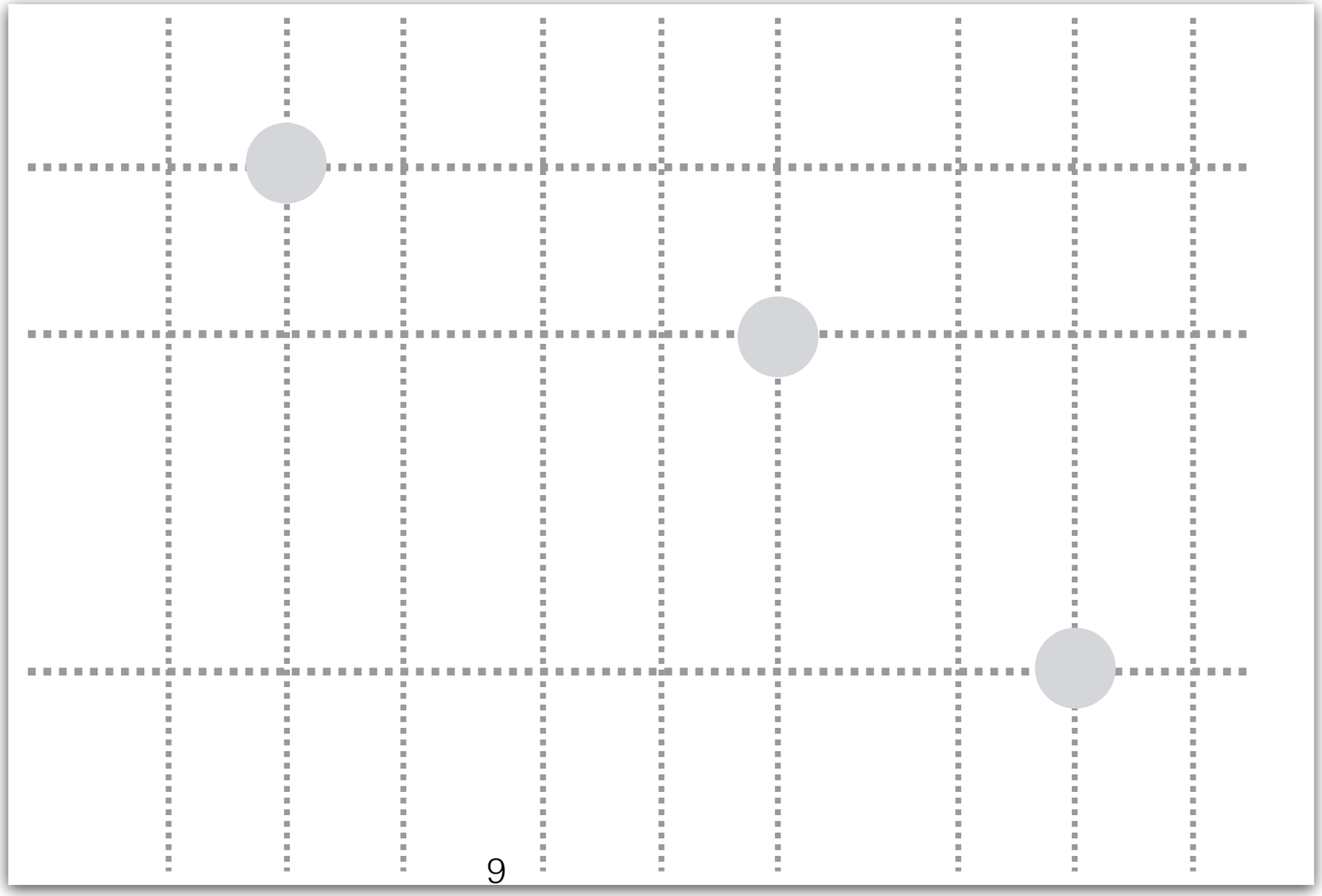
SubsFlow2

...

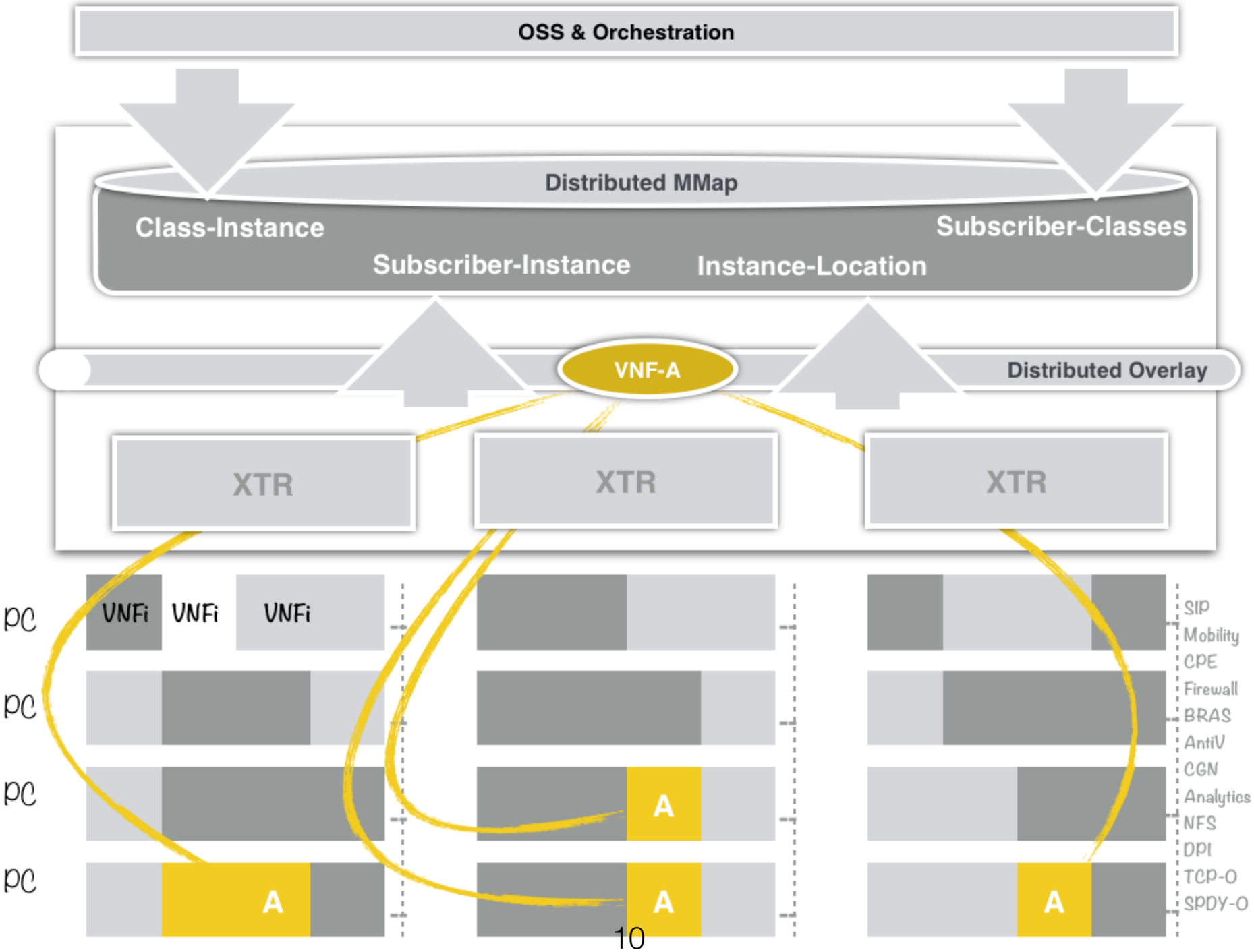
...

...

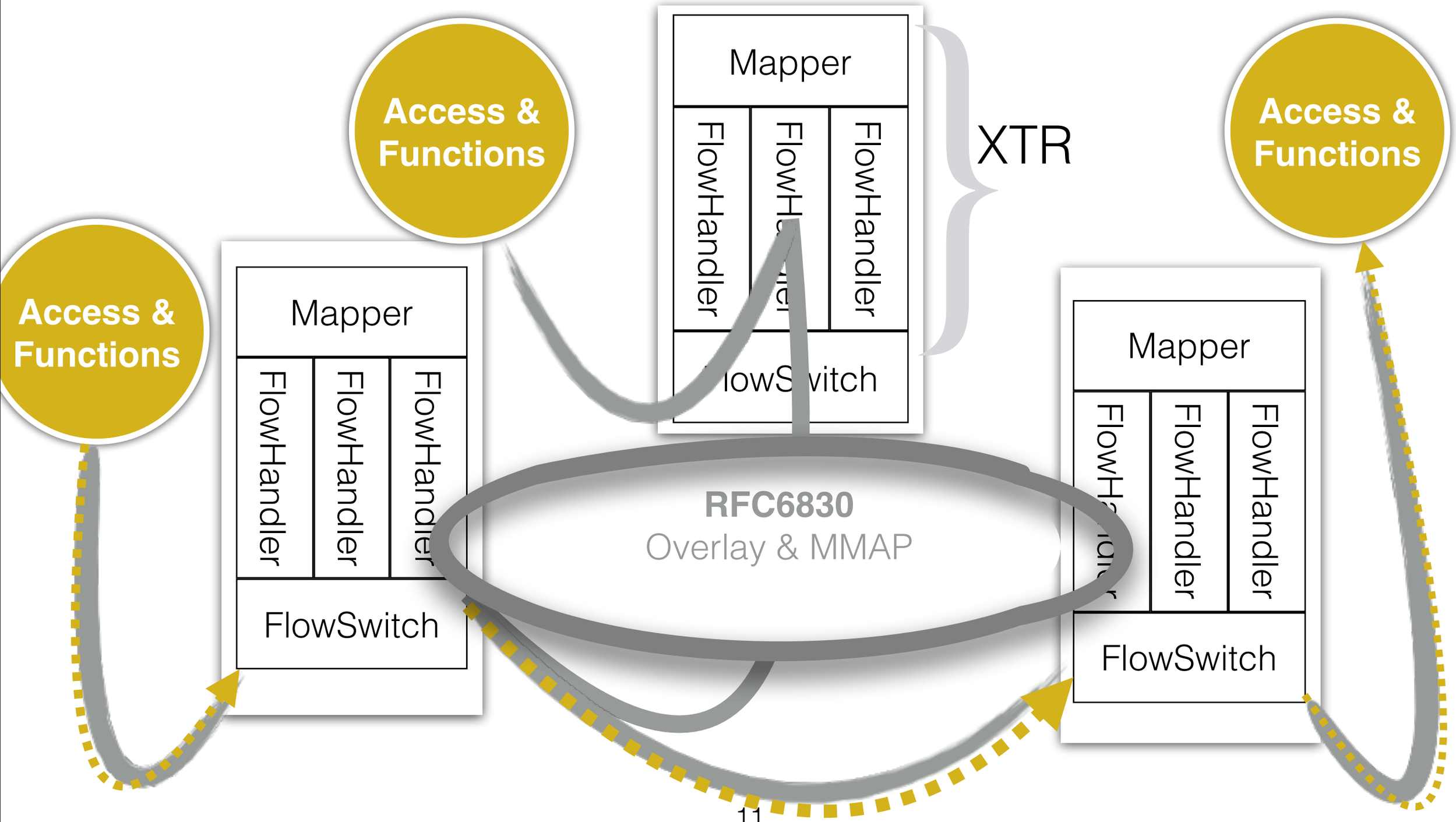
SubsFlowM



LISP Mapping



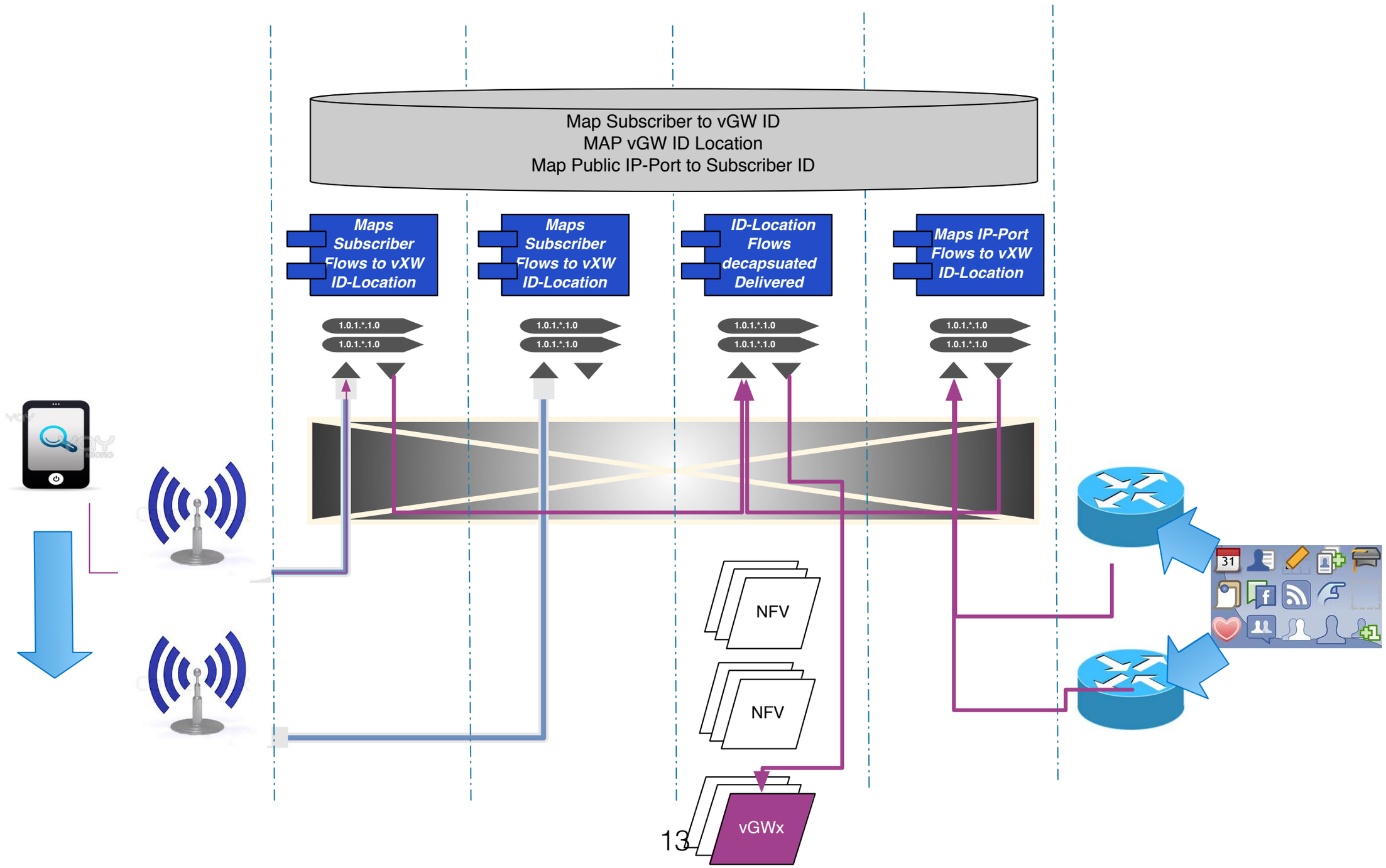
LISP Mapping



Flows-Handlers-Mappers

- Flows: n-tuple mask set, locally defined and best matched against each packet to separate traffic to sequences of application threads
- Flows: Encapsulated into overlay, Decapsulated out of overlay, or, Sent into the XTR registered handlers .. according to * match
- RFC 6830 is the default catch-all IP handler maps EID to Location, caches the mapping by local provision of transient ingress flows
- Function-class specific handlers, eg. GTP, S1X, SIP etc. receive unidentified flows, perform Mappings and provision instance flows
- RFC 6830 based ITR mapping of EID to Location, VIP to EIDs, SubscriberID to EID, IP-Port to SubscriberID, EIDs to Loads..

Day in a Life of a Mapped Flow



Things To Get Right in the lisp-nfv draft

- Exact use of LISP Canonical Address Format (LCAF) for mapping indirection function-instance-location, as well as instance-capacity/load/health in Intra-Provider usage

- Exact use of LISP Send Map Request (SMR) for implementing optional publish-subscribe mechanism of the MMAP service in Intra-Provider use cases

- Exact use of LISP Echo Req/Rep to enable measurement based FlowMapping decisions over Lots of Links and over Multiple data-centers and POPs

Thank You