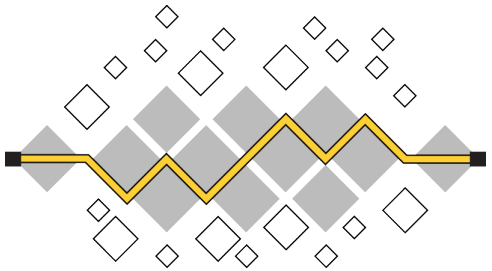


Cooperating Layered Architecture for SDN (CLAS)

<draft-contreras-sdnrg-layered-sdn-04>

Luis M. Contreras
Telefónica

Carlos J. Bernardos
Universidad Carlos III de Madrid (UC3M)

Diego R. López
Telefónica

Mohamed Boucadair
France Télécom/Orange

P. Iovanna
Ericsson

Yokohama, SDNRG WG, November 2015

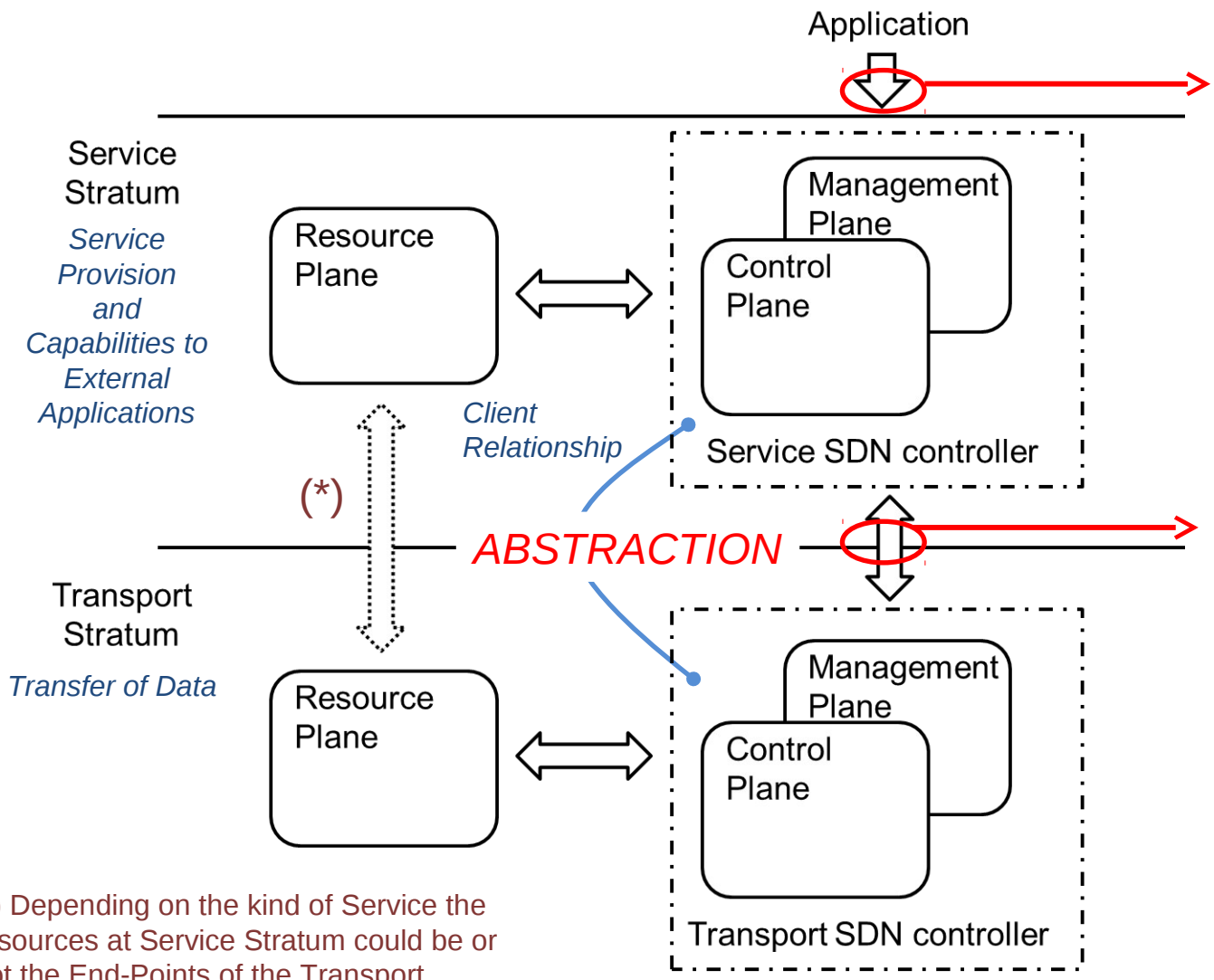
Rationale

- Existing proposals for SDN centralize control capabilities with very different objectives and purposes
- No separation between services and transport control
  - No clear responsibility for service provision and delivery
  - Complicated reutilization of components for delivering different services
  - Monolithic control architectures, driving to lock-in
  - Difficult interoperability, then difficult interchange of some modules by others
  - No clear business boundaries
  - Complex service/network diagnosis and troubleshooting

Cooperating Layered Architecture for SDN

- Key concept: separation of the control functions associated to services from those associated to transport
  - Service control becomes independent from transport control
- Functional Strata
  - Service stratum: functions related to the provision of services (including capabilities exposed to external applications)
  - Transport stratum: functions related to the transfer of data between communication end-points
- Plane separation
  - Control plane: control of resources in each strata
  - Management plane: management of resources and control plane in each strata
  - Resource plane: resources required for a given service (can be or not the termination points of a transport function)
- Despite differentiation, tight cooperation is needed for an efficient service provision

Cooperating Layered Architecture



- Means to capture service requirements of services
- Means to expose transport capabilities to external services
- Means to notify service intelligence with underlying transport events
- Means to instruct the underlying transport capabilities to accommodate new requirements

(*) Depending on the kind of Service the resources at Service Stratum could be or not the End-Points of the Transport Resources

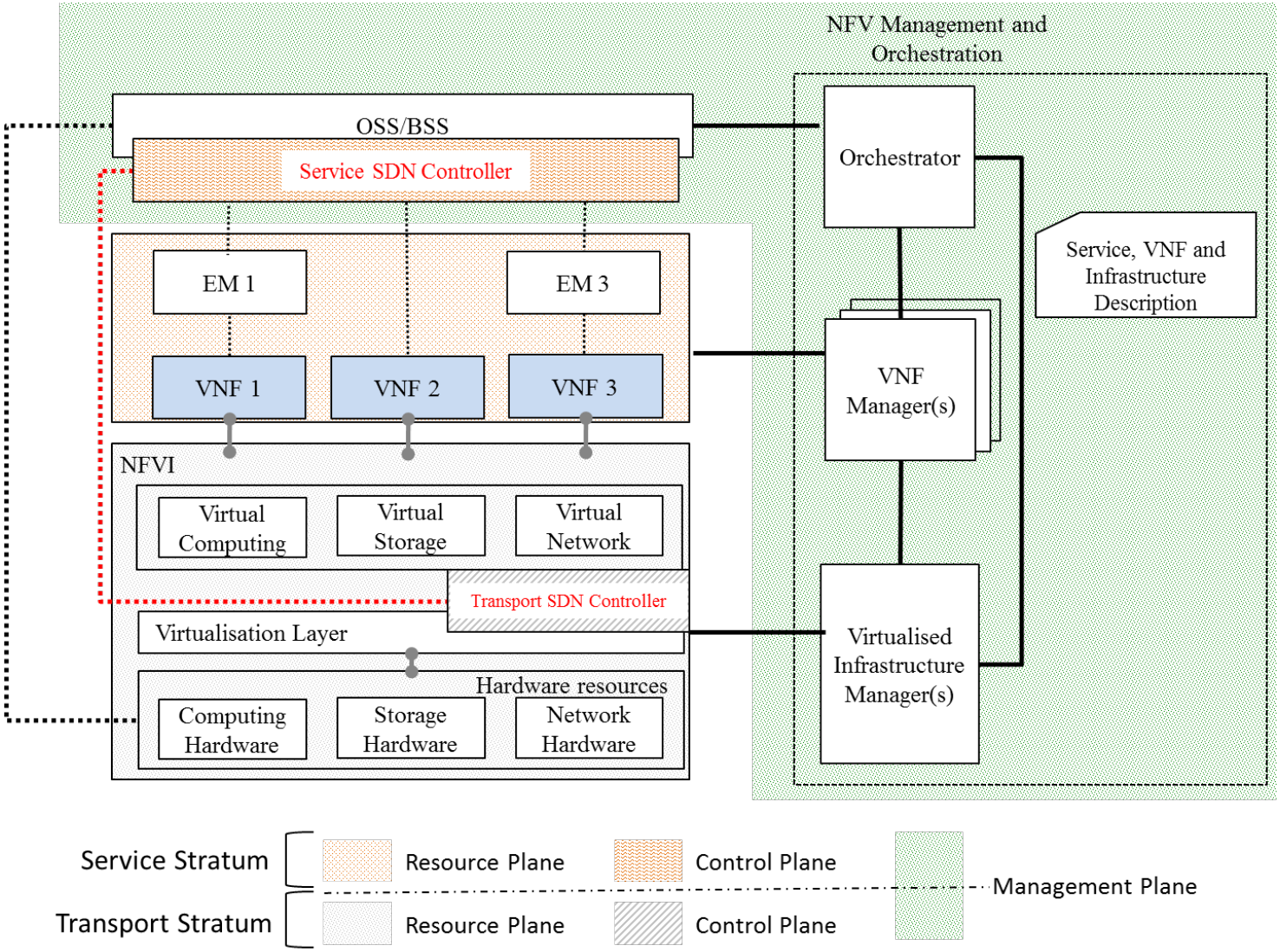
Additional topics in-scope

- Multi-domain scenarios in Transport Stratum
  - Transport resources being part of different administrative, topological or technological domains
- Recursiveness
  - Transport Stratum is itself structured in Service and Transport Stratum
- Security and trust
  - Security in the communication between strata
- Event notification, OAM, diagnosis

Deployment Scenarios

- Full SDN environment
  - Multiple Service Strata associated to a single Transport Stratum
  - Single Service Stratum associated to a multiple Transport Strata
  - (And 1:1 and N:N cases, of course)
- Hybrid environments
  - SDN-based Service Stratum associated to a legacy Transport stratum
  - Legacy Service Stratum associated to a SDN-based Transport stratum

Potential use cases / scenarios – e.g., NFV (*)



(*) Telefónica, *"Operational separation of SDN control for Service-oriented and Connectivity-oriented actions in the framework of NFV"*, NFVEVE(15)000066

History and Next Steps

- History
  - -00 presented in Toronto (90th IETF)
  - -02 presented in Dallas (92nd IETF)
- Changelog
  - Added initial considerations on multi-domain
  - Added section on required features
  - Added section on Communication between SDN Controllers
  - P. Iovanna (Ericsson) joined as a co-author
- Multiple feedback and support collected at the mailing list
- Next steps
  - Ask for adoption as RG document