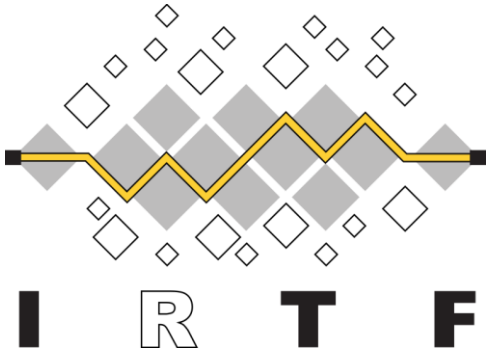

Cooperating Layered Architecture for SDN (CLAS)

<draft-irtf-sdnrg-layered-sdn-00>

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Buenos Aires, SDNRG WG, April 2015

History

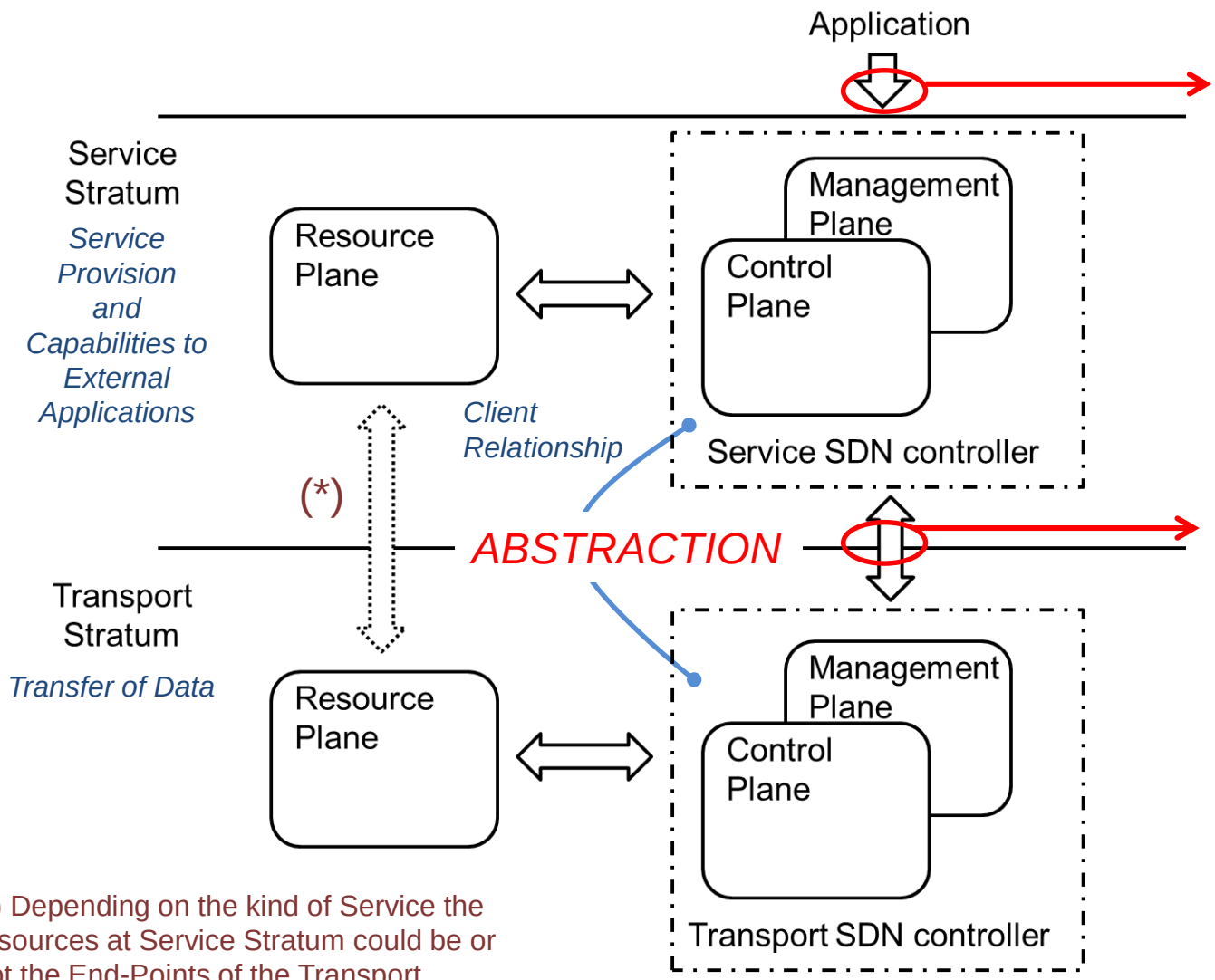
- History (draft-contreras-sdnrg-layered-sdn)
  - -00 presented in Toronto (90th IETF)
  - -02 presented in Dallas (92nd IETF)
  - -04 presented in Yokohama (94th IETF)
- Multiple feedback and support collected at the mailing list
- Adopted as RG document after Yokohama

  https://datatracker.ietf.org/doc/draft-irtf-sdnrg-layered-sdn/

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

Next steps / Comments received (I)

- Gabriel López
  - Editorial comments and some clarifications requested: addressed in -01
- Gert Grammel
  - Consider also related work done in draft-ietf-ccamp-interconnected-te-info-exchange: to be addressed in -01

Next steps / Comments received (II)

- Gino Carrozzo
  - Address specific challenges for implementing different control actions/scope between Transport & Service layer: to be addressed in -01
  - Address relationships with other WG/RG, in particular ACTN for Transport stratum: to be addressed in -01
  - Explore options for using the same architecture pattern recursively across the various layers: to be addressed in -01

Next steps / Comments received (III)

- Ramon Casellas
  - Develop the multi-domain aspects, with multiple 1:1, 1:N, N:1 and N:M relationships between service stratum and transport stratum: to be addressed in -01
  - Align with similar initiatives (ONF arch, ACTN within TEAS, etc.): it will be improved in -01

Next steps / Comments received (IV)

- Christian Esteve Rothenberg
  - Section 3.1.3 (on Recursiveness) should point (relate/compare) to related work at NFVRG (draft-unify-nfvrg-recursive-programming-02): to be addressed in -01
  - Use Case section should be completed in the next revision: it will be improved in -01
- Ali Haider
  - Improve motivation for the layer separation: to be addressed in -01

Next steps / Comments received (V)

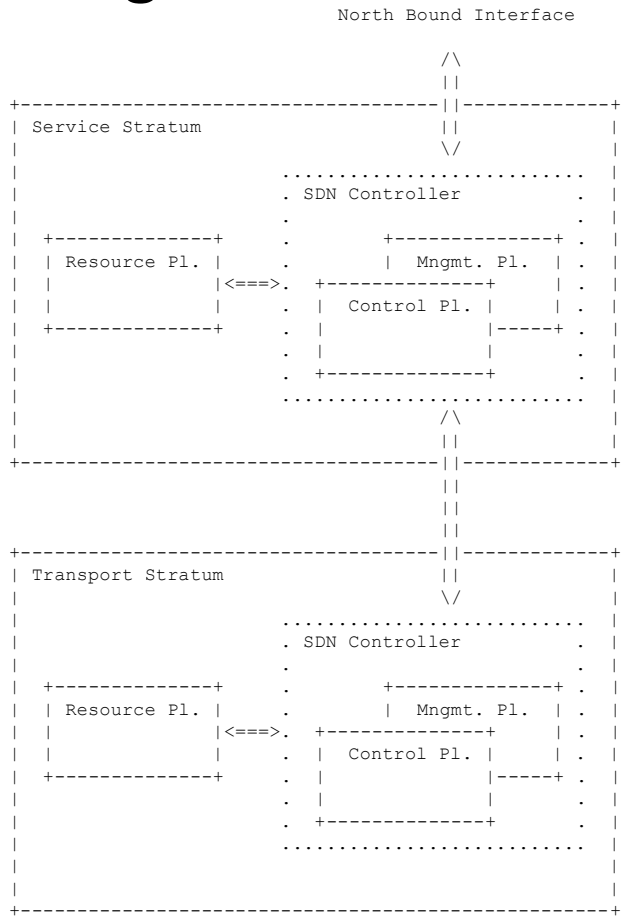
- Bartosz Belter
  - Improve motivation: to be addressed in -01
  - Complete use cases section: to be improved in -01
  - Include strong links towards other WG/RGs: to be improved in -01
- Maria Rita PALATTELLA
  - Provide a motivation, and some potential use cases which show the need of a modular architecture: to be improved/addressed in -01

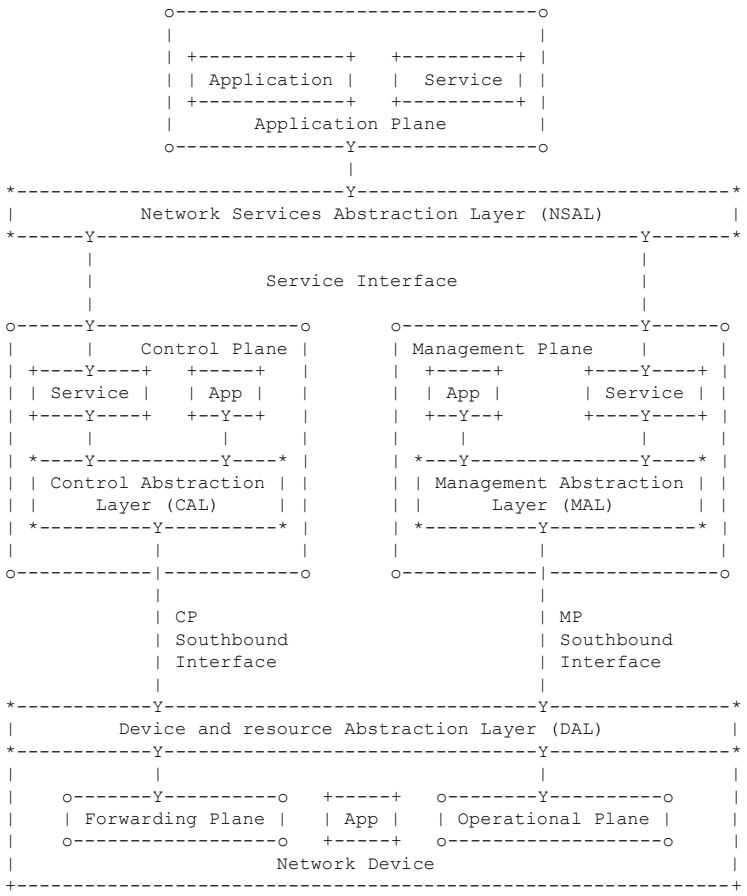
Next steps / Comments received (VI)

- Zheng Haomian
  - Improve sections 6 and 7 (deployment and use cases): to be improved in -01
- Jacek Wytrębowicz
  - Proposes splitting the architecture into three stratums: Service, Transport and Resource
    - Resource Stratum should contain Control and Management Planes as well: comments?
  - Better motivation and convincing use cases (with some working code as a proof of concept): to be improved in -01

Next steps / Comments received (VII)

- Evangelos Haleplidis
  - Consider juxtaposing Fig.1 from the draft with Fig.1 from RFC7426: comments?



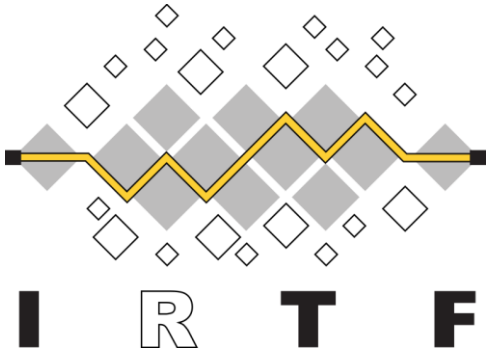


Next steps / Comments received (VIII)

- Evangelos Haleplidis (cont'd)
  - Showcase in Fig.1 that the communication is happening between respective planes in the strata while describing it in text: to be addressed in -01
  - Explicitly discuss the difference from the draft to ITU Y.2011: to be addressed in -01

Next steps / Requests to the WG

- Provide comments on the use cases
  - E.g., proposal for specific use cases to be considered
- Do you think we should split the architecture into three stratums: Service, Transport and Resource?
- Propose links towards other WG/RGs/SDOs not already included, that you think should be mentioned
- Additional reviews are always welcome!



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BACKUP SLIDES

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

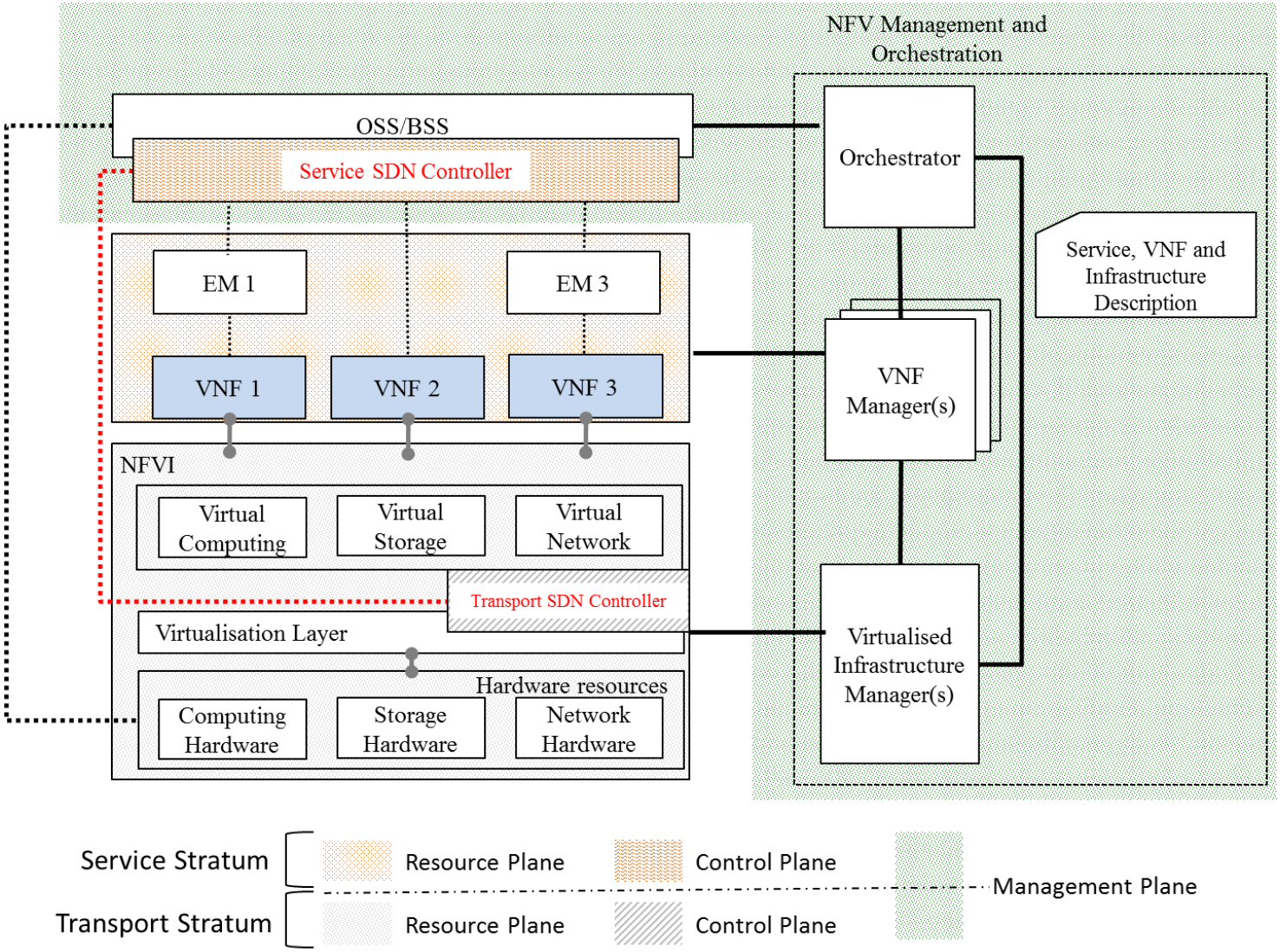
Additional topics in-scope

- 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