Service Function Chaining (SFC) Control Plane Components & Requirements

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Change Log

- Dallas meeting with different groups interested in the control plane effort
  - Agreement on the scope
  - AP: to consolidate an updated version to reflect the conclusions of the meeting
- -05: Complete rewrite of the I-D to follow the conclusions of the Dallas meeting
- -06: Integrate the comments received in the list

What is In?

- This document ***identifies a set of control interfaces*** to interact with SFC-aware elements to establish, maintain or recover service function chains.
- This document ***describes requirements*** for conveying information between SFC control elements and SFC functional elements
- Both ***distributed and centralized*** control plane schemes to install SFC-related state and influence forwarding policies as discussed
- Only ***the control of SFC-aware*** elements is discussed

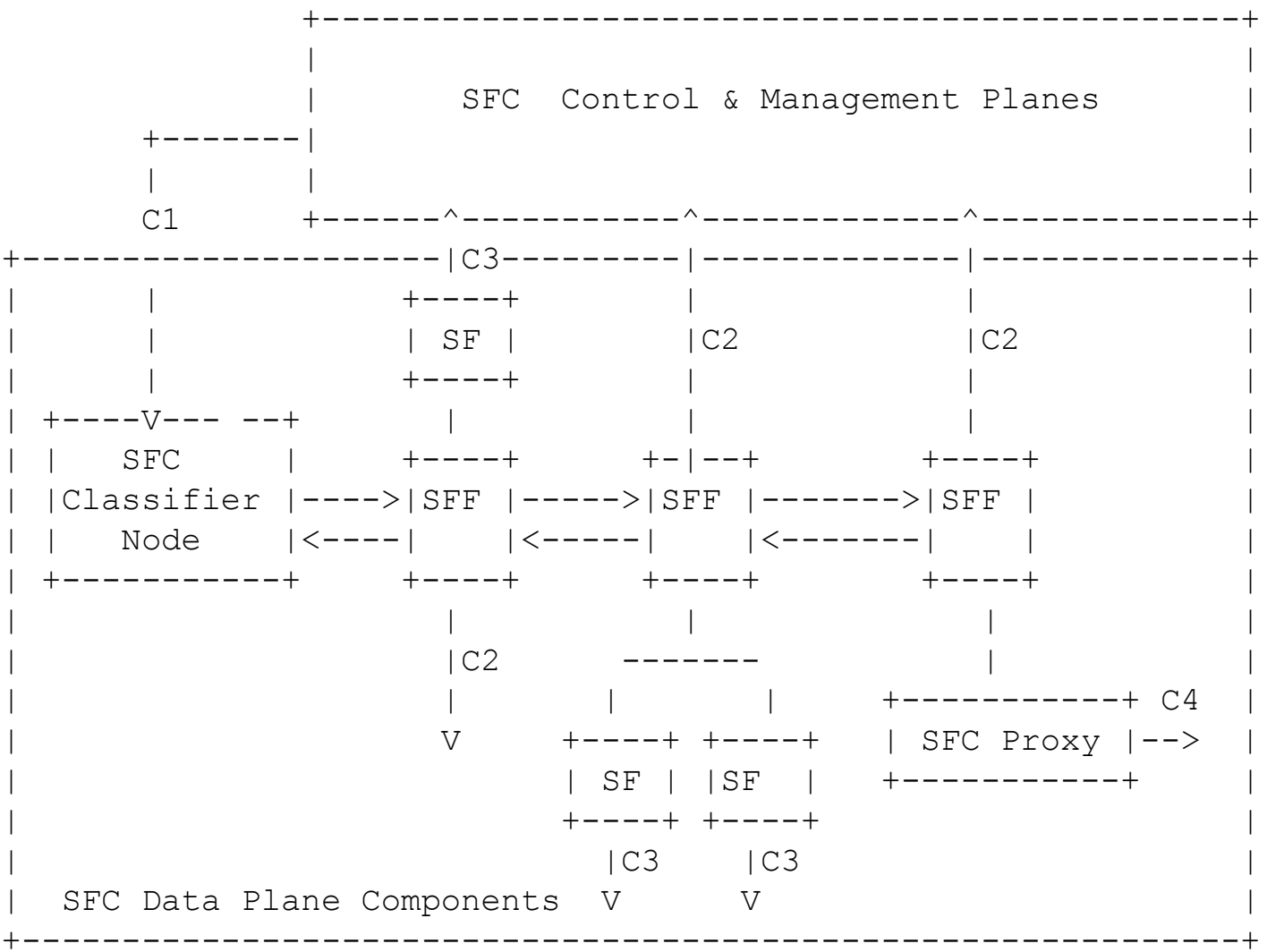
What is Out?

- Chaining of Service Functions located in domains operated by ***multiple administrative entities***
- ***SF-specific control*** and policy enforcement schemes; only SFC considerations are elaborated.
- ***No assumption is made about which control protocol*** to use, whether one or multiple control protocols are required, or whether the same or distinct control protocols will be used to exchange information through each of the identified control interfaces
- ***Specification of a profile*** for a protocol, to define protocol extensions, or select an existing protocol
- ***State synchronization*** between Control Elements
- The interface that is used to ***feed the SFC control plane*** with service objectives and guidelines

SFC Control Plane Tasks

- Build and monitor the service-aware topology
- Maintain a repository of service function chains, SFC matching criteria to bind flows to a given service function chain, and mapping between service function chains and SFPs
- Guarantee the coherency of the configuration and the operation of an SFC-enabled domain
  - Including to ensure state synchronization between Control Elements and SFC data plane elements
- Dynamically compute a service-aware forwarding path
- Determine a forwarding path
- Update service function chains or adjust SFPs (e.g., for restoration purposes)
- Populate SFC forwarding policy tables of involved SFC data plane elements and provide Classifiers with traffic classification rules

Reference Architecture



Additional Considerations

- Discovery of the SFC Control Element
- SF symmetry
- Pre-deploying SFCs
- Withdraw a Service Function (SF)
- SFC/SFP Operations
- Unsolicited (notification) messages
- SF liveliness detection
- …

(Some) Security Considerations

- The SFC Control Elements and the participating SFC data plane elements must mutually authenticate
- The communication between a Control Element and SFC data plane elements must provide integrity and replay protection
- The authentication mechanism should be immune to pervasive monitoring
- The SFC control plane must be able to instruct SFC data plane elements about the information to be leaked outside an SFC-enabled domain
- SFC data plane elements should rate limit the messages received from an SFC Control Element (to prevent DoS)
- …

Some Remaining Issues

- The question of whether the data plane operates just in terms of SFP IDs/RSP IDs or needs SFC IDs, as described in this version of the draft, is still under discussion
- OAM section is expected to be removed once the working group adopts a document on OAM

What's Next?

- The document is stable enough
- Request WG adoption
- Comments and contributions are welcome