Problem Statement, Use Cases, and Requirements of Hierarchical SFC with Segment Routing

https://datatracker.ietf.org/doc/draft-nh-sr-hsfc-usecases-requirements/

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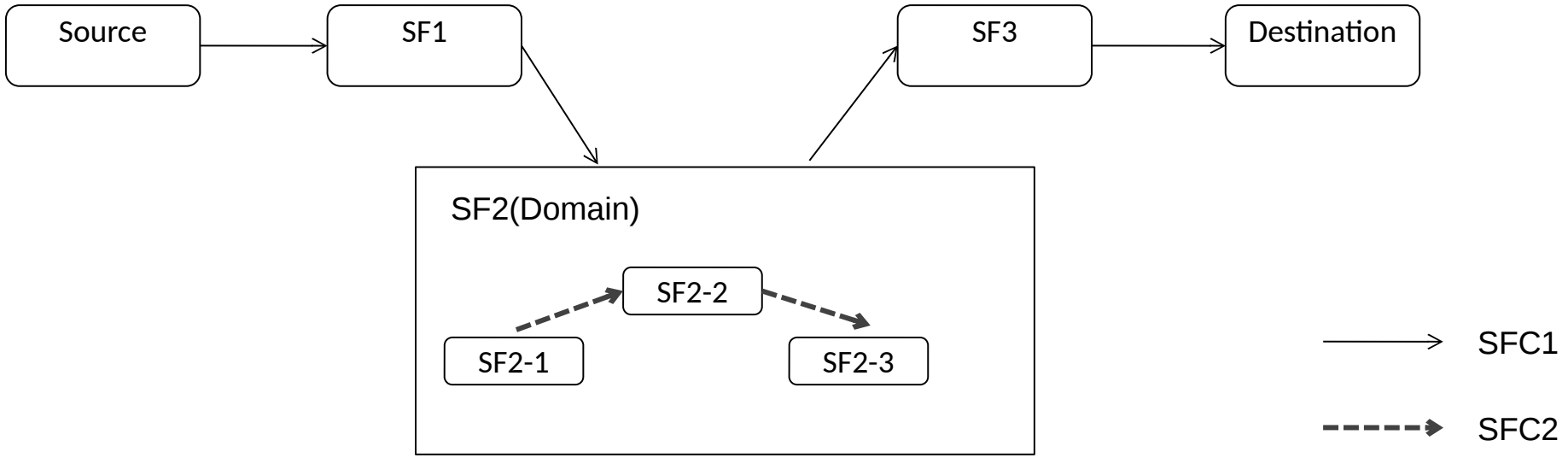
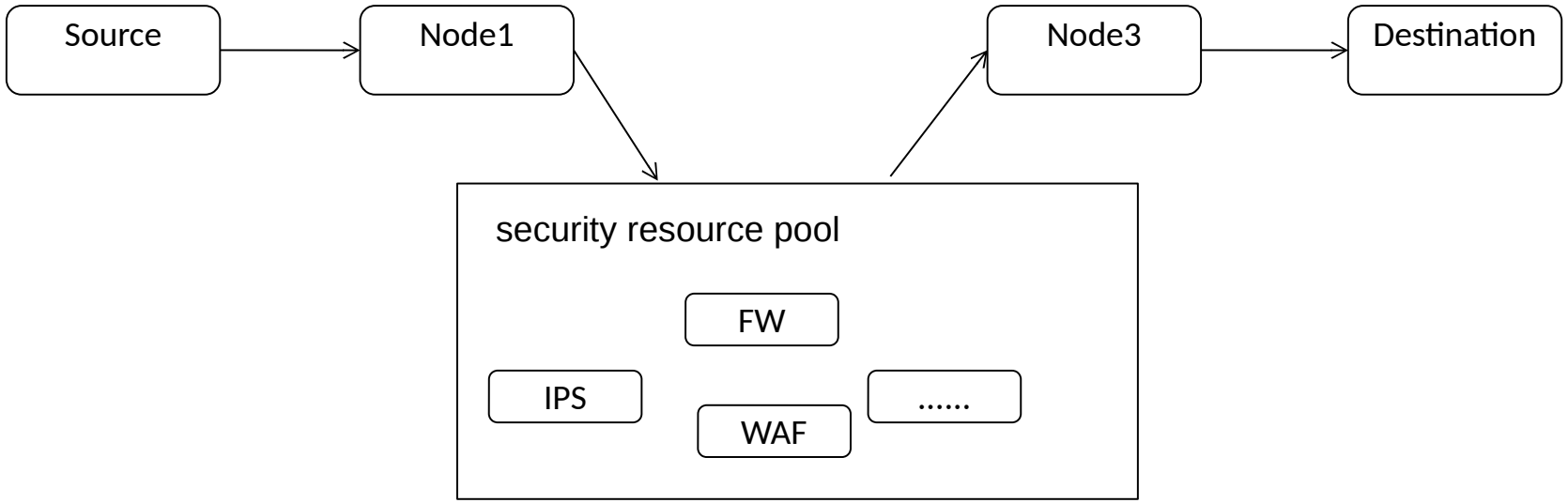
Hierarchical SFC



Network scale is large,decompose large-scale networks into multiple domains.

- SF is a single domain，or may support different manner of service function chaining from other SF.
- Providing better network design, simplified control.
- Providing multiple service function chainings.
- enhancing overall efficiency and management.

Use case of Hierarchical SFC with Segment Routing



- The security resource pool has deployed various security network devices such as FW, IPS, WAF, etc., to provide value-added services to tenants.
- The security resource pool services as an intermediate node, requires directing user traffic into the pool, which constitutes the first-level service chain.
- Different tenants have varying security services, and within the resource pool, service chains need to be constructed according to each tenant's specific needs, which constitutes the second-level service chain.
- In cases where SR (Segment Routing) networks are deployed, the NSH solution may not be the preferred choice. SR-based service chaining is recommended.

Problem statements for the use case

- Dispersion Of Service Resources

  The security resource pool is physically deployed in a distributed manner.

- Multi-tenant

  The security resource pool provides services for multiple tenants,It needs to provide tenant-level customized security protection capabilities.

- Multi-vendor

  The security network devices are usually provided by different vendors, they need to be orchestrated by unified external network communication.

- Dynamic Orchestration

  In a security resource pool, SF changes dynamically . The main issue with NSH is that network devices need to maintain state (SPI, SI index table), and when there are changes in business deployments, all network devices require state updates. SR is more user-friendly.

Requirements for the use case

- **REQ 1**: Tenant-level Service Orchestration.

  Different tenants have diferent needs.It’s necessary to support tenant-level service chain.

- **REQ 2**: Tenant Information Carriage.

  As it needs tenant-level service orchestration,It’s essential for the packets to carrying tenant information.

- **REQ 3**: Dynamic Allocation Of Service Resources (Scalability)

  When the SF in the resource pool updates,it’s essential to support orchestrating the new SF into the service chain.

- **REQ 4**: Independent Resource Pool Orchestration.

  Different security resource pools support various service chain methods,It‘s necessary for security resource pools to support independent orchestration.

- **REQ 5**: Reliablity Of Service Function.

  When an SF fails, the service chain should be able to bypass that SF.

Next step

- Refine the draft upon comments and suggestions
- Seeking solutions

Thank You!