Service Chaining Problem Statement
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Author List in draft-quinn-sfc-problem-statement
Acknowledgements

• All the authors and contributors on the SFC/NFC list
• Details see the problem stmt
• Authors and Contributors
  – Checkout the Problem stmt draft
BASIC ISSUES
Topology and Config Complexity

• Topology Dependency
  • Sub optimal forwarding
  • Services have to be deployed inline
  • Services cannot be applied ‘intra’ BD traffic

• Configuration Complexity
  • Vlan Stitching
    • Vlan number space
    • Resource reuse
  • VRF Stitching
    • Prefix Replication
    • Protocol exports
  • Service appliances run switching/routing instead of focusing on ‘their core functions’
  • Hop by Hop, Policy Based Routing
    • Operations nightmare
  • Expand the Network
    • Forces provider to buy more service appliances, whether they need more service or NOT!!
Network Topology changes inter-twined with Service HA

- Network and Services are tightly coupled
  - Constrained HA. Example
    - Failure of Link to Agg switch means sub optimal forwarding or Loss of service

Traffic forced thru the link
Rigid Service Ordering

• Goal
  • Application A → B order service order is
    • Green, followed by Orange
  • Application A → C service order is
    • Orange

• Approach
  • Vlan stitching
    • All traffic from A forced thru Service Green
    • Waste processing capacity for Green
  • PBR
    • Fragile/Operationally complex
    • Pkt fragments??
    • Multicast??
    • Assumes all “Cs” can be summarized with prefixes
Multi Vendor interoperability/Context Sharing
Elastic Service Deployment
Service Graphs
Simplicity of Operations and Provisioning
Directionality of services
E2E visibility

NEXT TIER OF ISSUES
Try rendering a business policy like...

- All traffic btw Internet and Web Front end servers, apply
  - De/Encryption with highest throughput/low latency and least $ cost
  - Copy all ‘Mobile’ only transactions to a Big Data Analytics system
  - Perform copy at most optimal pt ($ cost and least latency impact)
  - Send all traffic thru a SLB+WAF and an IDS

- Additionally deploy this policy with other caveats like
  - Compute elasticity
  - Compute mobility
  - Service elasticity
  - Service functions are both virtual and physical
  - Vendor neutral

- Practically Impossible TODAY!
Some of the Issues holding us back...

- Service and Network Topology Intertwined
- Configuration Complexity
- Rigid Service Ordering (e.g., chains but no graphs)
- Dynamic workload provisioning
  - Network topology
  - Service
- Interoperability of Vendors
  - No standards for service Meta Data format
  - Meta data is encoded and exported in Transport layer
  - Can’t break service functions based on optimal $ cost
  - No service + network Multi vendor standards
- Elasticity
  - Service Elasticity
- Operational Complexity
  - No end to end trouble shooting
Multi Vendor interoperability/Context Sharing
Elastic Service Deployment

ANOTHER SCENARIO CASE
Say there is a business policy like...

- All traffic btw Internet and Web Front end servers, apply Reputation Security and SLB, followed by IDS functions
  - LB load balances to Pool
  - Security appliance looks for anomalies and reputation based on some ‘global’ telemetry data

- Further the policy is
  - If the Web FE pool is overloaded, de-prioritize transactions from sources with ‘Bad’ reputation

- Impossible across multiple vendors and independent of transport
  - No meta data standard
  - No transport independent std

- Impossible TODAY!