Multilevel configuration

draft-bogdanovic-multilevel-configuration-00

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Motivation

• Network device configurations grow along the time for several reasons
  • Addition / removal of services and customers, sometimes without proper clean up of previous configs
  • Debugging sessions for fixing operational problems
  • Dynamic evolution of traffic flows, protocols, peers, etc.

• All the config information on the device is multiplexed into a single file, hard to manage

• Central databases, with all the network configuration files, have not remedied the problem
Where multi-level configuration could help? - some use cases

• Service assurance

• Network slicing
  • Mean of instantiation, operation and decommissioning of IETF Network Slices

• Network migrations and merging
  • Split of the migration/merging problem in smaller pieces, dealing with the issue per configuration/service level instead of considering the whole configuration
  • Allowing incremental execution of the process by acting on particular levels each time

• Zero touch provisioning
  • Incremental deployment of configuration levels following a similar auto-installing approach
Service Assurance

• draft-claise-opsawg-service-assurance-architecture
  • Closed control loop system that modifies the running configuration according to the intent and the network operational state
  • Requires lot of dynamic configuration changes
• Help on identifying by design the correlation among services and atomic functions in the network
IETF Network Slicing Configuration

• Slicing can be hierarchical
  • Resources allocated for a slice can be at different layers
  • A slice can be over other slices
• Slicing configuration can be hierarchical and recursive
  • Slicing architecture covers multiple layers
  • Slicing architecture covers multiple domains
• Multilevel configuration
  • Each layer is configured independently
  • Each domain is configured independently
  • Each layer and each domain can be considered as a subservice
  • Configurations of layers and domains are coordinated
Multilevel Configuration for Slicing

Customer Slice Blue

Customer Slice Red

Provider Network
Higher Layer

Provider Network
Lower Layer

Virtual Link for Network Slice Blue

Virtual Link for Network Slice Red
Proposal

- Incremental configurations can be viewed as multiple panes of glass in a systematic manner.
- Each level can be handled in an independent manner, minimizing the impacts in other levels.
- Each level is autonomous and cooperative.

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Next steps

• Presenting at RTGWG and NMRG

• Complete the description of the proposal and identify viable solutions/approaches

• Collect feedback/comments from the WG

• Prepare a new version for IETF#110