Autonomic Networking: Generic Discovery and Negotiation Supporting

draft-jiang-config-negotiation-ps
draft-jiang-config-negotiation-protocol

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Introduction

- Autonomic Networking needs simplest and generic supporting for discovery and negotiation

  - Able to manage any type of information

  - Able to discovery counterpart for any objectives

  - Bi-direction negotiation without human intervention

  - Little dependences

- Generic protocol, independent of negotiation contents

Existing protocols

- Routing protocols: basically one-way announcements.

- SNMP (command/response): not recommended for configuration.

- NETCONF (RPC model): heavyweight for single data elements.

- DHCP[v6], ND, PCP, RADIUS, Diameter: elements of negotiation, but limited.

- RSVP or GIST: per-flow, not device-to-device, negotiation. Some flexibility.

- Duplicated Discovery for each protocol specific purpose

- one-way information announcement model or narrow-scope negotiation function

A Configuration Discovery and Negotiation Protocol

- IP Version Independent

- Objective Oriented Discovery Mechanism

  - + Neighbor Diverting Discovery Mechanism

- Certificate-based Security Mechanism

- Negotiation Procedures

- CDNP Messages & General Options

- Objective Options

  - Supporting for negotiation objectives in a high-level format such as YANG or an XML schema may also be developed

Steps of CSG Auto-Conf
Prototype validation with running code

Last Mile   **Access**   **Aggregation & Core**
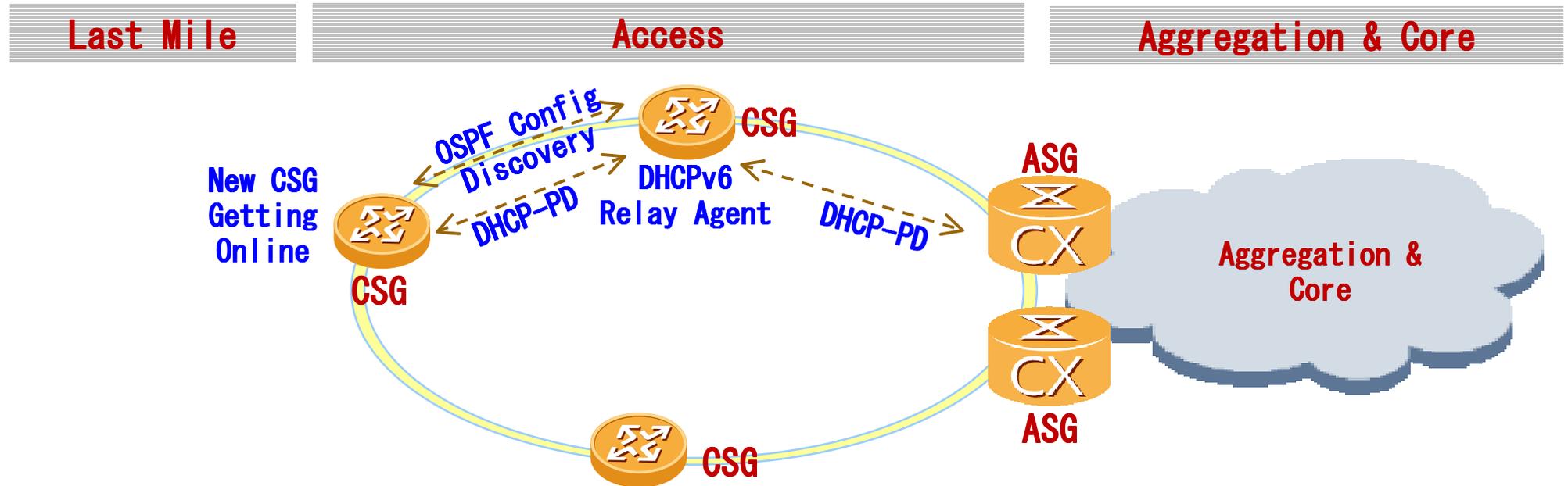
1. A new CSG getting online, autoconf the two ring interfaces with link-local addresses

2. CSG assigned a prefix (/48) from ASG through DHCP-PD, config the addresses

3. OSPF configurations by the Configuration Discovery and Negotiation Protocol

- Every negotiation starts with a **Negotiation-Objective discovery mechanism** which explicitly discovers "who can give me OSPF Configuration"

- The role is identified in the perspective of service, e.g. OSPF configuration、MPLS Tunnel configuration, etc.

Steps of eNodeB Auto-Conf
Prototype validation with running code
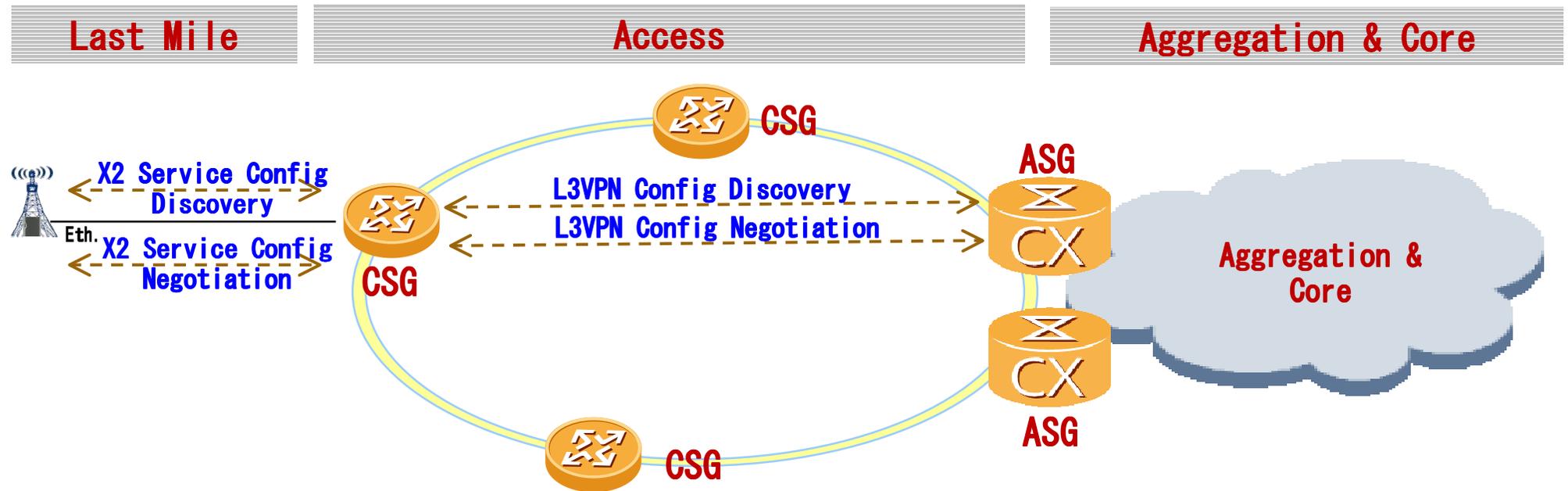
1. The eNodeB gets online, configures address by SLAAC

2. The eNodeB negotiates X2 Service configuration with the CSG through the Configuration Discovery and Negotiation Protocol

   - started with the Negotiation-Objective discovery mechanism, "Who should set up correspondent X2 Service configuration?"

3. The above negotiation request initiates CSG to set up a L3VPN tunnel with ASG. So the CSG initials a L3VPN negotiation with ASG through the Configuration Discovery and Negotiation Protocol

   - started with the Negotiation-Objective discovery mechanism, "Who is L3VPN PW concentrator?"

   - Negotiation contents include MPLS Tunnel Config, inner MPLS-VPN Config etc.

4. The CSG finishes the configuration negotiation for the eNodeB

Questions?
Comments?

Thanks!

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Network Configuration Negotiation Problem Statement and Requirements
draft-jiang-config-negotiation-protocol
Configuration Discovery and Negotiation Protocol for Network Devices