Interworking of GMPLS Control and Centralized Controller System

TEAS WG, IETF103, Bangkok, Thailand

draft-zheng-teas-gmpls-controller-inter-work-01

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Motivation of this work

DP = Data Plane;
CP = Control Plane (with GMPLS)

GMPLS Control Plane
- RSVP-TE
- OSPF-TE
- LMP

Centralized Controllers
- ACTN Controllers
- Netconf/RESTconf+YANG
- PCE Protocol

Inter-work?
Major Changes since IETF 102

• Replacement of draft-zheng-ccamp-gmpls-controller-inter-work;
• Removal of Signaling Options (CR-LDP);
• References updated;
### Topology Discovery Scenario

**Interface Type**

- **Neighbor Level**: Local Resource Discovery (e.g. LMP)
- **NE Level**: Topology Discovery with Flooding of Information among NEs (e.g., OSPF-TE)
- **From PCE/Controller to NE**: Interaction between PCE/Controllers to NE

**Topology Discovery Scenario**

<table>
<thead>
<tr>
<th>IF Type:</th>
<th>Topology Initiation</th>
<th>Topology Update (e.g. add one node)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LMP</td>
<td>Number of LMP message: increase accordingly</td>
</tr>
<tr>
<td>2</td>
<td>OSPF (ISIS)</td>
<td>Message: each message will flood additional info</td>
</tr>
<tr>
<td>3</td>
<td>PCEP/Netconf</td>
<td>New PCEP session from new node to PCE; / Need new message to configure the new node; Database will be updated</td>
</tr>
</tbody>
</table>

**Diagram**

- **Controller**
- **PCE**
- **Transport Network**
  - 1. LMP initiation
  - 2. OSPF (ISIS) message
  - 3. PCEP/Netconf interaction
## Service Provisioning Scenario

### Service Provisioning Decomposition:

1. **Step:** Path Computation -> Path Establishment -> Database (NE/CTRL) update
2. **Mode:** Computation & signaling can be either centralized or distributed

<table>
<thead>
<tr>
<th></th>
<th>Distributed Control Plane</th>
<th>Centralized Path Compute + Distributed Signaling</th>
<th>Centralized Path Compute + Centralized Signaling</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Path Compute</strong></td>
<td>OSPF</td>
<td>PCEP/Netconf(Restconf)</td>
<td>PCEP/Netconf(Restconf)</td>
</tr>
<tr>
<td><strong>Path Setup</strong></td>
<td>RSVP</td>
<td>RSVP(inter-NE, IF#2)</td>
<td>PCEP/Netconf(Restconf)</td>
</tr>
<tr>
<td><strong>Resource Update</strong></td>
<td>OSPF</td>
<td>OSPF(inter-NE, IF #2) PCEP-LS/Netconf (IF#3)</td>
<td>OSPF(inter-NE, IF #2) PCEP-LS/Netconf (IF#3)</td>
</tr>
</tbody>
</table>

**References:**
- RFC3473
- RFC4203
- RFC4872/3/4
- RFC4203
- RFC8281
- RFC6241, RFC8040
- RFC 4203
- RFC8283
- RFC6241, RFC8040
Summary & Next Step

• Have received good support at IETF 102
  – Consensus on co-existence and interworking between distributed and centralized control
  – Open to suggestions regarding more detailed descriptions of scenarios and protocols involved

• Ask for WG Adoption