Interworking of GMPLS Control and Centralized Controller System

TEAS WG, IETF104, Prague, Czech

draft-zheng-teas-gmpls-controller-inter-work-03

Authors:
Haomian Zheng (zhenghaomian@huawei.com)
Xianlong Luo (luoxianlong@huawei.com)
Yunbin Xu (xuyunbin@ritt.cn)
Yang Zhao (zhaoyangyjy@chinamobile.com)
Sergio Belotti (sergio.belotti@nokia.com)
Dieter Beller (Dieter.Beller@nokia.com)
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 103

• From -01 to -03;
  – Solve the comments raised by advisor & chairs;

• In particular:
  – In section 2.3 “ACTN” is presented as an example of implementing centralized control, but not the only one;
  – Correcting descriptions on usage of existing solutions;
  – Adding security/manageability considerations;
  – References updated;
Next Step

- Ask for WG Adoption
  - Have received good support at IETF 102/103;
- To address the comments from Lou to provide detailed description in section 7 about scenarios;
  - Chairs agreed to address after WG adoption;
FOR BACKUP USE
### Interface Type

1. **Neighbor Level**: Local Resource Discovery (e.g. LMP)
2. **NE Level**: Topology Discovery with Flooding of Information among NEs (e.g., OSPF-TE)
3. **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>

![Topology Diagram](diagram.png)
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>Path Compute</td>
<td>OSPF</td>
<td>PCEP/Netconf(Restconf)</td>
<td>PCEP/Netconf(Restconf)</td>
</tr>
<tr>
<td>Path Setup</td>
<td>RSVP</td>
<td>RSVP(inter-NE, IF#2)</td>
<td>PCEP/Netconf(Restconf)</td>
</tr>
<tr>
<td>Resource Update</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>

IETF Ref: RFC3473, RFC4203, RFC4872/3/4

Notes:
- Service Provisioning Scenario
- Distributed Control Plane
- Centralized Path Compute + Distributed Signaling
- Centralized Path Compute + Centralized Signaling
- Path Compute: OSPF, PCEP/Netconf(Restconf)
- Path Setup: RSVP, PCEP/Netconf(Restconf)
- Resource Update: OSPF, PCEP-LS/Netconf (IF#3)
- IETF Ref: RFC3473, RFC4203, RFC4872/3/4