Interworking of GMPLS Control and Centralized Controller System

CCAMP WG, IETF102, Montreal, Canada

draft-zheng-ccamp-gmpls-controller-inter-work-02

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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

Controller Hierarchies

Controller

Inter-work?

CP = Control Plane; DP = Data Plane;
Major Changes since -01

• Two new co-authors added
• Abstract polished to better summarize the content
• More detailed description provided regarding the usage of Netconf/RESTconf in conjunction with IETF YANG models in mixed multi-domain scenarios
• Path computation session updated with the focus on optimal path computation in multi-domain in order to overcome the limitations of abstraction
• Paragraphs on existing GMPLS protocols improved
• References updated
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

- **IF Type:** Topology Initiation

<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>

Transport Network

Controller

PCE
### 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>
<tr>
<td>IETF Ref</td>
<td>RFC3473, RFC4872/3/4</td>
<td>RFC8281, RFC6241, RFC8040</td>
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IETF Ref: RFC3473, RFC4872/3/4, RFC8281, RFC6241, RFC8040
Summary & Next Step

• Have received good support at IETF 101
  – 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