Dynamic Path Sélection Based on Application
draft-aumuganainar-rtgwg-dps-00

Arun Arumuganainar
Outline

- Problem statement
- Solution overview
- DPS Architectural framework
- Current implementation
- Future work
Challenges and Solutions on the IP Network

Network availability
Achieved through redundant paths and Routing protocol convergence

Network performance
Achieved through Quality of Service techniques

Score Card
- Availability :- Excellent . 99.999 Availability is reality today
- Application performance is still a challenge
What is the problem with QOS?

It provides symptomatic Treatment. Does not eradicate the root cause (congestion caused by aggressive non-critical applications)
DPS Solution Overview

- Separate traffic as critical and non-critical based on application port numbers.
- Ensure that the separated application flows over different path in the network.
- Ensure that there is no asymmetric routing.
DPS Architectural framework

Non-Resilient DPS Routing domain (Built over secondary circuit)

Fault Recovery (Static Routing)

During Faults in the DPS Routing Domain, Packets are ejected & Routes Normally

Non Critical Traffic to DPS Destination pushed to DPS routing domain

Critical Traffic and All Traffic to Non-DPS Destination pushed to Normal routing domain

Profile based Filter
Applied at Incoming traffic at the LAN handoff point

DPS Signalling (QPPB)
DPS Signalling module dynamically programs Profile based filter

Incoming traffic passed through profile based filter

Normal Routing Domain
Native IP Routed network Built over primary and secondary in active-passive mode using BGP
# Current Implementations

<table>
<thead>
<tr>
<th>DPS Building blocks</th>
<th>Implementation route</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DPS Signalling</strong></td>
<td>BGP Communities and QPPB (QoS Policy Propagation via BGP)</td>
</tr>
<tr>
<td><strong>DPS Routing Domain</strong></td>
<td>VRF Lite, DMPN and OSPF</td>
</tr>
<tr>
<td><strong>DPS Profile based Filters</strong></td>
<td>PBR and IP Precedence based ACLs</td>
</tr>
<tr>
<td><strong>Fault Recovery</strong></td>
<td>OSPF and Default Static routing</td>
</tr>
</tbody>
</table>
Future Work

DPS framework is very flexible. Individual components can be developed independently.

Following areas of enhancements are currently being explored:

Challenge 1:-

- **DPS** Signalling currently implemented at Layer 3.
- With little bit of work Signalling can be implemented at Layer 4.
- Layer 4 implementation will be state full and hence we can achieve advanced traffic management.

Challenge 2:-

- Profile based filtering is done via PBR. Hence this comes with performance limitations.
- A lightweight mechanism needs to be developed to overcome the performance limitation.
Questions???