Fabric: A Retrospective on Evolving SDN

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with

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## Ideal Network Design

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
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<tbody>
<tr>
<td>Simple</td>
<td>Flexible</td>
</tr>
<tr>
<td>Vendor-neutral</td>
<td></td>
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<tr>
<td>Future-proof</td>
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Any control information passed between system entities provides hint at an interface:

<table>
<thead>
<tr>
<th>Hosts</th>
<th>express their destination and QoS requirements for the network.</th>
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<tr>
<td>Switches</td>
<td>look into packet headers and forward based on the above requirements.</td>
</tr>
<tr>
<td>Operators</td>
<td>express TE, security, ..., requirements for the network.</td>
</tr>
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Interfaces in IP

- Host-network and packet-switch interfaces are conflated.
- Minimal operator-network interface.
- Routing protocol does it all.

Interface for host

Interface for network (IP router)
Interfaces in MPLS

- MPLS separates the host-network interface from packet-switch interface.
- No general network-operator interface!

Diagram:

- Interface for edge
- Interface for MPLS switch

- L2
- MPLS Labels
- Src IP
- Dst IP
- L4 ...

Diagram shows a flow between these interfaces.
Interfaces in OpenFlow

- SDN provides programmatic network-operator interface.
- Host-network interface are packet-switch again conflated!
Introducing Fabric to SDN

- **Src Host** to **Edge Switch**
- **Fabric (Switches)**
- **C_E**
- **Edge Switch** to **Dst Host**

**Fabric Header**: L2, Src IP, Dst IP, L4 ...

Interface for edge and host

Interface for fabric
<table>
<thead>
<tr>
<th>Questions &amp; Implications</th>
<th></th>
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<tbody>
<tr>
<td>Isn’t this just protocol layering?</td>
<td>Layering provides no decoupling between elements but only between layers.</td>
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<td>What are the implications for OpenFlow?</td>
<td>Edge and fabric versions of OpenFlow?</td>
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<tr>
<td>And more general implications?</td>
<td>Fabrics combined with edge software switching allows for architectural evolution!</td>
</tr>
</tbody>
</table>
Thanks!

Questions?