VM Network Virtualization

Pedro Marques pedro.r.marques@gmail.com

Ping Pan ping@pingpan.org (presenting)

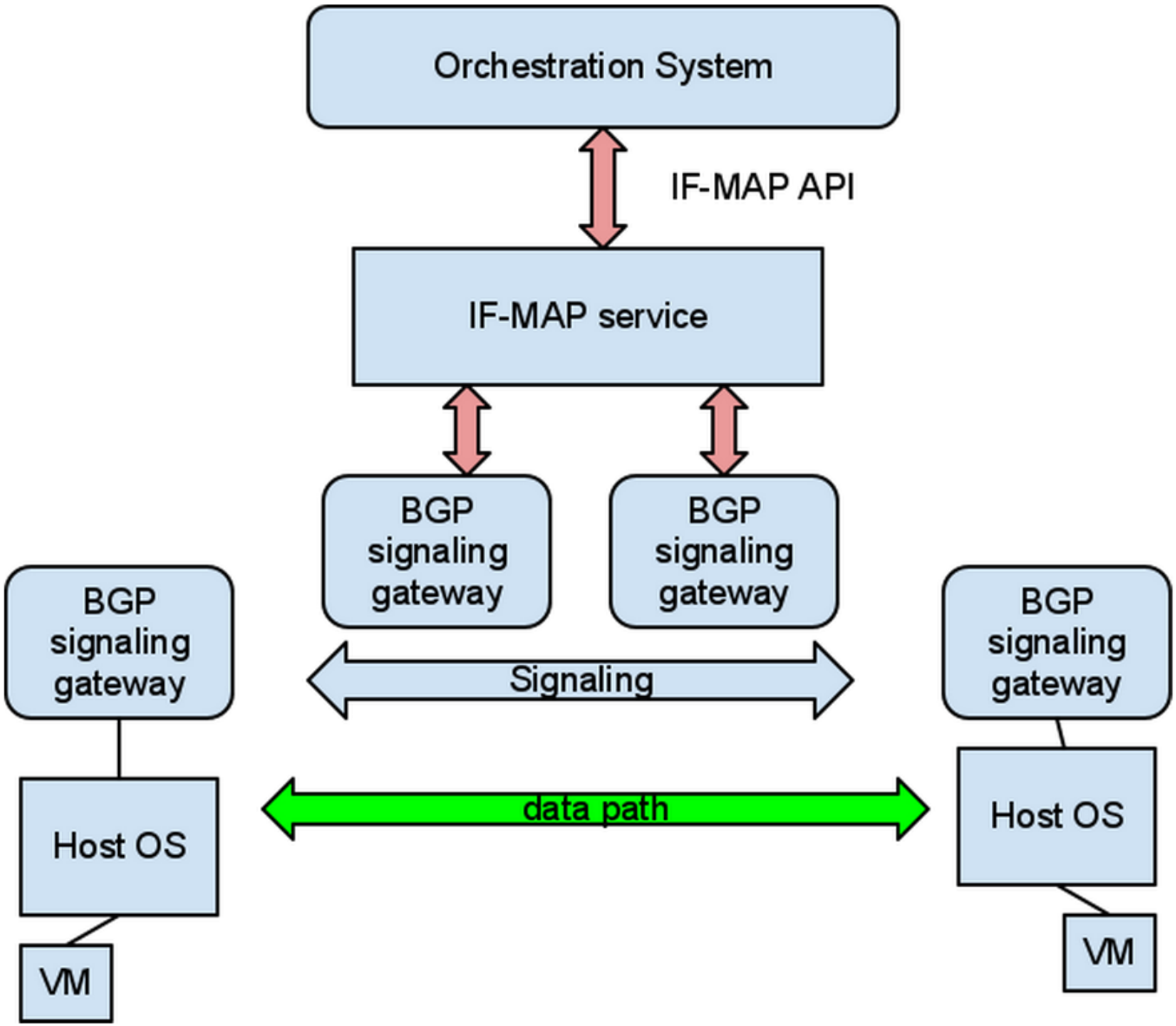
Luyuan Fang lufang@cisco.com

Amit Shukla amit@juniper.net

The Goal

- Network virtualization solution for data-center.
- Enable standards-based programmatic APIs between orchestration systems and the network.
- Reuse existing protocols
  - Proven technology.
  - Time to deployment.

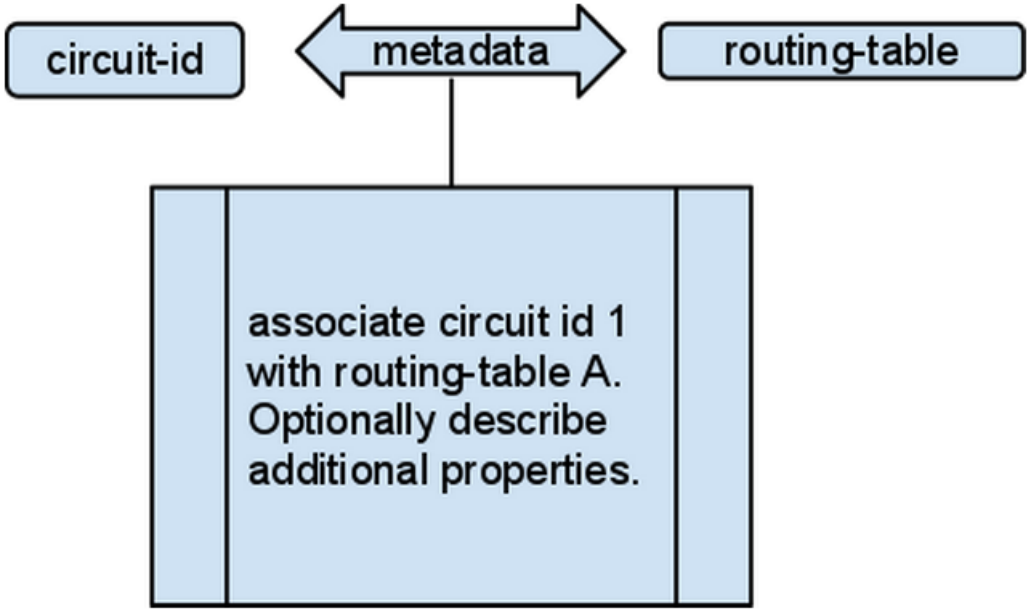
The Architecture



The Components

- End-system: vSwitch or Host OS supporting VMs.
  - Comparison with standard l3vpn: end-system is a remote line-card using a standard interface (simple XML schema).
- BGP signaling gateway
  - XMPP server for N end-systems (e.g. thousands of PE-CE sessions are common in SP space using mobile CPUs).
  - signaling gateways interconnect to each other using BGP l3vpn.
- IF-MAP as a programmatic interface between orchestration and BGP signaling gateways.
  - Supports both provisioning and operational state.

IF-MAP and Illustration



- IF-MAP in Concept:
  - Database that stores relationships between entities (e.g. circuit is associated with routing table).
  - The database can be modified, queried or provide notifications to subscribers interested in part of the state.

IF-MAP Example

```
<?xml version="1.0"?>
<ifmap:publish session-id="1"
   xmlns:ifmap="http://ietf.org/I-D.marques-l3vpn-schema">
  <update>
   <customer-attachement id="vm:00:00:00:01:02:03"/>
   <metadata>
    <binding ifmap-cardinality="singleValue">
      <table-name>SimpleVPN</table-name>
    </binding>
    <attachement-state>
    <provider-edge>192.168.0.1</provider-edge>
    <state>Up</state>
    </attachement-state>
   </metadata>
  </update>
</ifmap:publish>
```