Housekeeping

- We value your feedback- don't forget to complete your online session evaluations after each session & the Overall Conference Evaluation which will be available online from Thursday
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- Please switch off your mobile phones
- After the event don’t forget to visit Cisco Live Virtual: www.ciscolivevirtual.com
- Follow us on Twitter for real time updates of the event: @ciscoliveeurope, #CLEUR
Agenda

- Mobility and Virtualization in the Data Center
- Introduction to LISP
- LISP Data Center Use Cases
- LAN Extensions: OTV
- LISP + OTV Deployment Considerations
- Summary and Conclusion

Slides Identified with the Book Icon Are Provided for Your Reference and Will Not Be Part of the Live Presentation
Distributed Data Centers
Building the Data Center Cloud

Distributed Data Center Goals
- Seamless workload mobility
- Distributed applications
- Pool and maximize global resources
- Business Continuity

Interconnect Challenges
- Complex operations
- Transport dependence
- IP subnets and mobility
- Failure containment

Geographically Disperse Data Centers
Connecting Virtualized Data Centers

Multi-tenancy/segmentation:
Segment-IDs in LISP, FabricPath and OTV

L2 Domain Elasticity:
vPC, FabricPath/TRILL
OTV LAN extensions

Device Virtualization:
VDCs,
VRF enhancements
MPLS VPN

IP Mobility:
LISP

Workload Mobility

LAN Extension – OTV, VPLS
SAN Extension

Location of compute resources is transparent to the user

VM-awareness:
VN-link
Port Profiles
Agenda

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Location Identity Separation Protocol
What Do We Mean by “Location” and “Identity”?

Today’s IP Behavior
Loc/ID “Overloaded” Semantic

When the Device Moves, It Gets a New IPv4 or IPv6 Address for Its New Identity and Location

LISP Behavior
Loc/ID “Split”

When the Device Moves, Keeps Its IPv4 or IPv6 Address. It Has the Same Identity

Device IPv4 or IPv6 Address Represents Identity and Location

Device IPv4 or IPv6 Address Represents Identity Only.

Only the Location Changes

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A LISP Packet Walk
How Does LISP Operate?

1. DNS Entry: D.abc.com A 10.2.0.1

2. 10.1.0.1 -> 10.2.0.1

3. EID-prefix: 10.2.0.0/24
   Locator-set:
   - 2.1.1.1, priority: 1, weight: 50 (D1)
   - 2.1.2.1, priority: 1, weight: 50 (D2)

4. 1.1.1.1 -> 2.1.1.1
   10.1.0.1 -> 10.2.0.1

5. 10.1.0.1 -> 10.2.0.1

This Policy Controlled by Destination Site
A LISP Packet Walk

How About Non-LISP Sites?

1. DNS Entry: D.abc.com A 10.2.0.1

2. 192.3.0.1 -> 10.2.0.1

3. Mapping Entry
   - EID-Prefix: 10.2.0.0/24
   - Locator-Set:
     - 2.1.1.1, priority: 1, weight: 50 (D1)
     - 2.1.2.1, priority: 1, weight: 50 (D2)

4. 4.4.4.4 -> 2.1.2.1
   - 192.3.0.1 -> 10.2.0.1

5. 192.3.0.1 -> 10.2.0.1

Non-LISP Site

Non-LISP Site

EID-to-RLOC mapping

10.2.0.0/24

10.3.0.0/24

West

East-DC
LISP Roles and Address Spaces
What Are the Different Components Involved?

LISP Roles
- **Tunnel Routers - xTRs**
  - Edge devices in charge of encap/decap
  - Ingress/Egress Tunnel Routers (ITR/ETR)
- **EID to RLOC Mapping DB**
  - Contains RLOC to EID mappings
  - Distributed across multiple Map Servers (MS)
  - MS may connect over an ALT network
- **Proxy Tunnel Routers - PxTR**
  - Coexistence between LISP and non-LISP sites
  - Ingress/Egress: PITR, PETR

Address Spaces
- **EID = End-point Identifier**
  - Host IP or prefix
- **RLOC = Routing Locator**
  - IP address of routers in the backbone
LISP Mapping Database
The Basics – Registration and Resolution

Mapping Cache Entry (on ITR):
10.2.0.0/16 -> (2.1.1.1, 2.1.2.1)

Map-Request
10.2.0.1

Map-Reply
10.2.0.0/16 -> (2.1.1.1, 2.1.2.1)

Map Server / Resolver: 5.1.1.1

Database Mapping Entry (on ETR):
10.2.0.0/16 -> (2.1.1.1, 2.1.2.1)

Database Mapping Entry (on ETR):
10.3.0.0/16 -> (3.1.1.1, 3.1.2.1)

West-DC
10.2.0.0 /16

10.2.0.2

Y

X

ETR

ETR

ETR

ETR

East-DC
10.3.0.0/16

Y

Z
Basic LISP Configuration

**Border Routers Between Backbones**
- `ip lisp proxy-itr`
- `ip lisp ITR map-resolver 5.3.3.3`

**Branch Routers**
- `ip lisp itr-etr`
- `ip lisp ITR map-resolver 5.3.3.3`

**DC Aggregation Routers**
- `ip lisp itr-etr`
- `ip lisp database-mapping 10.2.0.0/24 2.1.1.1 p1 w50`
- `ip lisp database-mapping 10.2.0.0/24 2.1.2.1 p1 w50`
- `ip lisp ETR map-server 5.1.1.1 key s3cr3t`
- `ip lisp ETR map-server 5.2.2.2 key s3cr3t`

**Servers**
- `ip lisp map-resolver`
- `ip lisp map-server`
- `lisp site west-DC`
- `authentication-key 0 s3cr3t`
- `eid-prefix 10.2.0.0/24`

**Non-LISP Sites**
- `10.2.0.0/24`
- `5.3.3.3`

**IP Network**
- `10.2.0.0/24`
- `5.1.1.1`
- `5.2.2.2`

**LISP Site**
- `1.1.1.1`
- `5.3.3.3`

**Mapping DB**
- `2.1.1.1`
- `2.1.2.1`

**West-DC**
- `10.2.0.0/24`

**East-DC**

**Usually Devices Will Be Configured as ITRs and ETRs to Handle Traffic in Both Directions; We Illustrate Only One Direction for Simplicity**
Location ID/ Separation Protocol (LISP)
Next Generation Networking Architecture

Single Network Architecture Delivers:
- **VM Mobility** (topology independent addressing)
- **Security**: VPNs/Multi-tenancy
- Route **Scalability** (on demand routing)
- IPv6 enablement,
- Routing Policy simplification

**Benefits**
- Services integrated in a single architecture
- Services can be offered across organizational boundaries (multiple providers)
- Very large scale
- Open model to integrate with cloud orchestrators

**Use-Cases**
- DCI route optimization/mobility
- Workload Portability to Cloud
- Secure Multi-tenancy across organizations
- Rapid IPv6 Deployment
- Route scaling

Making the Network Cloud-Ready
**LISP Use Cases**

**Consolidated Architecture with Multiple Applications**

**Efficient Multi-Homing**
- IP Portability
- Ingress Traffic Engineering without BGP

**IPv6 Transition Support**
- v6-over-v4, v6-over-v6
- v4-over-v6, v4-over-v4

**Multi-Tenancy and VPNs**
- Reduced CapEx/OpEx
- Large scale Segmentation

**Host-Mobility**
- Cloud / Layer 3 VM moves
- Segmentation
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  - Host-Mobility
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LISP Host-Mobility

**Needs:**
- Global IP-Mobility across subnets
- Optimized routing across extended subnet sites

**LISP Solution:**
- Automated move detection on xTRs
- Dynamically update EID-to-RLOC mappings
- Traffic Redirection on ITRs or PITRs

**Benefits:**
- Direct Path (no triangulation)
- Connections maintained across move
- No routing re-convergence
- No DNS updates required
- Transparent to the hosts
- Global Scalability (cloud bursting)
- IPv4/IPv6 Support
Host-Mobility Scenarios

Moves Without LAN Extension

- IP Mobility Across Subnets
  - Disaster Recovery
  - Cloud Bursting
  - Application Members in One Location

Moves With LAN Extension

- Routing for Extended Subnets
  - Active-Active Data Centers
  - Distributed Clusters
  - Application Members Distributed (Broadcasts across sites)
LISP Host-Mobility - Move Detection

Monitor the Source of Received Traffic

- The new xTR checks the source of received traffic
- Configured dynamic-EIDs define which prefixes may roam

```
lisp dynamic-eid roamer
database-mapping 10.2.0.0/24 <RLOC-C> p1 w50
database-mapping 10.2.0.0/24 <RLOC-D> p1 w50
map-server 5.1.1.1 key abcd
interface vlan 100
lisp mobility roamer
```

Received a Packet …

... It’s from a “New” Host
... It’s in the **Dynamic-EID** Allowed Range

...It’s a Move!
Register the /32 with LISP
LISP Host-Mobility - Traffic Redirection
Update Location Mappings for the Host System Wide

- When a host move is detected, updates are triggered:
  - The host-to-location mapping in the Database is updated to reflect the new location
  - The old ETR is notified of the move
  - ITRs are notified to update their Map-caches

- Ingress routers (ITRs or PITRs) now send traffic to the new location

- Transparent to the underlying routing and to the host
Host Mobility Across Subnets
LISP Host-Mobility - First Hop Routing Across Different Subnets

- SVI (Interface VLAN x) and HSRP configured as usual
  Consistent GWY-MAC configured across all dynamic subnets

- The lisp mobility <dyn-eid-map> command enables proxy-arp functionality on the SVI
  The LISP-VM router services first hop routing requests for both local and roaming subnets

- Hosts can move anywhere and always talk to a local gateway with the same MAC

- Totally transparent to the moving hosts
Host-Mobility and Multi-homing ETR updates – across LISP sites

Null0 host routes indicate the host is “away”
Refreshing the map caches

1. ITRs and PITRs with cached mappings continue to send traffic to the old locators
   - The old xTR knows the host has moved (Null0 route).

2. Old xTR sends Solicit Map Request (SMR) messages to any encapsulators sending traffic to the moved host

3. The ITR then initiates a new map request process

4. An updated map-reply is issued from the new location

5. The ITR Map Cache is updated
   - Traffic is now re-directed
   - SMRs are an important integrity measure to avoid unsolicited map responses and spoofing
LISP Host-Mobility Configuration
Across Subnets (No LAN Extensions)

```
ip lisp ITR-ETR
ip lisp database-mapping 10.2.0.0/16 <RLOC-A>
ip lisp database-mapping 10.2.0.0/16 <RLOC-B>

lisp dynamic-eid roamer
database-mapping 10.2.0.0/24 <RLOC-A>
database-mapping 10.2.0.0/24 <RLOC-B>
map-server 1.1.1.1 key abcd
map-notify-group 239.1.1.1
interface vlan 100
  ip address 10.2.0.10 /16
  lisp mobility roamer
  ip proxy-arp
  hsrp 101
  mac-address 0000.0e1d.010c
  ip 10.2.0.1

ip lisp ITR-ETR
ip lisp database-mapping 10.3.0.0/16 <RLOC-C>
ip lisp database-mapping 10.3.0.0/16 <RLOC-D>

lisp dynamic-eid roamer
database-mapping 10.2.0.0/24 <RLOC-C>
database-mapping 10.2.0.0/24 <RLOC-D>
map-server 1.1.1.1 key abcd
map-notify-group 239.2.2.2
interface vlan 100
  ip address 10.3.0.11 /16
  lisp mobility roamer
  ip proxy-arp
  hsrp 201
  mac-address 0000.0e1d.010c
  ip 10.3.0.1
```
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Why do we really need LAN Extensions?

- Not necessarily for moving workloads:
  Can be solved with IP mobility solutions: LISP Host Mobility

- Application High Availability → Distributed Clusters
  e.g. Node Discovery & Heartbeats in clustered Applications
LAN Extensions Evolution
From Circuits to Packets

Circuits + Data Plane Flooding

- Full mesh of circuits (pseudo-wires)
- MAC learning based on flooding
  ➔ Failure propagation
  ➔ Limited information
- Operationally Challenging
  Loop prevention and multi-homing must be provided separately

Packet Switching + Control Protocol

- Packet switched connectivity
- MAC learning by control protocol
  ➔ Failure containment
  ➔ Rich information
- Operational simplification
  Automatic loop prevention & multi-homing

Traditional L2 VPNs

MAC Routing
**OTV Data Plane**

**Inter-Site Packet Flow**

1. Layer 2 lookup on the destination MAC. MAC 3 is reachable through IP B
2. The Edge Device encapsulates the frame
3. The transport delivers the packet to the Edge Device on site East
4. The Edge Device on site East receives and decapsulates the packet
5. Layer 2 lookup on the original frame. MAC 3 is a local MAC
6. The frame is delivered to the destination
Building the MAC Tables
The OTV Control Plane

- OTV **proactively advertises** MAC reachability (control-plane learning)
- MAC addresses advertised in the background once OTV has been configured
- IS-IS is the OTV Control Protocol running between the Edge Devices
- **No specific configuration is required**
Overlay Transport Virtualization (OTV)

Simplifying LAN Extensions

- **Ethernet LAN Extension over any Network**
  - Works over dark fiber, MPLS, or IP
  - Multi-data center scalability

- **Simplified Configuration & Operation**
  - Seamless overlay - No network re-design
  - Single touch site configuration

- **High Resiliency**
  - Failure domain isolation
  - Seamless Multi-homing

- **Maximizes available bandwidth**
  - Automated multi-pathing
  - Optimal multicast replication

Many Physical Sites – One Logical Data Center

Any Workload, Anytime, Anywhere
Unleashing the Full Potential of Compute Virtualization
Ingress Routing Challenge in DCI
Extending Subnets Creates a Routing Challenge

- A subnet usually implies location
- Yet we use LAN extensions to stretch subnets across locations
  Location semantics of subnets are lost
- Traditional routing relies on the location semantics of the subnet
  Can’t tell if a server is at the East or West location of the subnet
- More granular (host level) information is required
  LISP provides host level location semantics
Host Mobility in Extended Subnets
Host-Mobility and Multi-homing ETR updates – Extended Subnets

Null0 host routes indicate the host is “away”

Routing Table:
10.2.0.0/16 – Local
10.2.0.0/24 – Null0
10.2.0.2/32 – Null0

Routing Table:
10.2.0.0/16 – Local
10.2.0.0/24 – Null0
10.2.0.2/32 – Local

Routing Table:
10.2.0.0/16 – Local
10.2.0.0/24 – Null0
10.2.0.2/32 – Null0

10.2.0.0 /24 is the dyn-EID

Map-Register
10.2.0.2/32 <C,D>

Map-Notify
10.2.0.2/32 <C,D>

10.2.0.2/32 <C,D>
Refreshing the map caches

1. ITRs and PITRs with cached mappings continue to send traffic to the old locators
   1. The old xTR knows the host has moved (Null0 route).
2. Old xTR sends Solicit Map Request (SMR) messages to any encapsulators sending traffic to the moved host.
3. The ITR then initiates a new map request process.
4. An updated map-reply is issued from the new location.
5. The ITR Map Cache is updated
   - Traffic is now re-directed
   - SMRs are an important integrity measure to avoid unsolicited map responses and spoofing.
LISP Host-Mobility - First Hop Routing
With Extended Subnets

- Consistent GWY-IP and GWY-MAC configured across all sites
  Consistent HSRP group number across sites ➞ consistent GWY-MAC

- Servers can move anywhere and always talk to a local gateway with the same IP/MAC

```
interface vlan 100
  ip address 10.2.0.5/24
  lisp mobility roamer
  lisp extended-subnet-mode
  hsrp 101
  ip 10.2.0.1

interface vlan 100
  ip address 10.2.0.7/24
  lisp mobility roamer
  lisp extended-subnet-mode
  hsrp 101
  ip 10.2.0.1

interface vlan 200
  ip address 10.2.0.8/24
  lisp mobility roamer
  lisp extended-subnet-mode
  hsrp 101
  ip 10.2.0.1

interface vlan 100
  ip address 10.2.0.1
```

HSRP Active

West-DC
10.2.0.0 /24

HSRP ARP
GWY-MAC

HSRP Active

East-DC
10.2.0.0 /24

HSRP ARP
GWY-MAC

LISP-VM (xTR)

ARP"
LISP VM-Mobility Configuration
With Extended Subnets → Use “Extended-Subnet-Mode”

```
ip lisp ITR-ETR
ip lisp database-mapping 10.2.0.0/16 <RLOC-A>
ip lisp database-mapping 10.2.0.0/16 <RLOC-B>
ip lisp database-mapping 10.2.0.0/16 <RLOC-C>
ip lisp database-mapping 10.2.0.0/16 <RLOC-D>

lisp dynamic-eid roamer
   database-mapping 10.2.0.0/24 <RLOC-A> ...
database-mapping 10.2.0.0/24 <RLOC-B>
map-server 1.1.1.1 key abcd
map-notify-group 239.10.10.10
interface vlan 100
   ip address 10.2.0.10 /16
   lisp mobility roamer
   lisp extended-subnet-mode
   hsrp 101
      ip 10.2.0.1
```

```
ip lisp ITR-ETR
ip lisp database-mapping 10.2.0.0/16 <RLOC-A>
ip lisp database-mapping 10.2.0.0/16 <RLOC-B>
ip lisp database-mapping 10.2.0.0/16 <RLOC-C>
ip lisp database-mapping 10.2.0.0/16 <RLOC-D>

lisp dynamic-eid roamer
   database-mapping 10.2.0.0/24 <RLOC-C> ...
database-mapping 10.2.0.0/24 <RLOC-D>
map-server 1.1.1.1 key abcd
map-notify-group 239.10.10.10
interface vlan 100
   ip address 10.2.0.11 /16
   lisp mobility roamer
   lisp extended-subnet-mode
   hsrp 101
      ip 10.2.0.1
```
Off-Subnet Client-Server Traffic
All Off-Subnet/Off-Site Traffic Is LISP Encapsulated

- Clients (192.168.0.1 & 192.168.2.1) communicate with Server 10.2.0.2
- Client-server traffic is LISP encapsulated at the ITRs or PITRs
  - Client-to-server: to ETRs C or D
  - Server-to-client: to ETR (F) for LISP sites
    - to PETR (G) for non-LISP sites
- Server-Server off-subnet traffic across sites is also LISP encapsulated
On-Subnet Server-Server Traffic
On Subnet Traffic Across L3 boundaries

With LAN Extension
- Live moves and cluster member dispersion
- Traffic between X & Y uses the LAN Extension
- Link-local-multicast handled by the LAN Extension

Without LAN Extensions
- Cold moves, no application dispersion
- X-Y traffic is sent to the LISP-VM router & LISP encapsulated
- Need LAN extensions for link-local multicast traffic
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LISP Multi-Tenancy

High Level View

**Needs:**
- Integrated Segmentation
- Ease of operations
- Global Scale and interoperability

**LISP Solution:**
- Traffic (control & data) is “colored” (tagged) with an instance-ID
- Mappings are also “colored” in DB and caches
- On xTRs use VRFs as map cache contexts

**Benefits:**
- Very high scale tenant segmentation
- VRFs are highly distributed
- VRFs populated on demand
- No adjacencies to maintain
- Global mobility + high scale segmentation integrated in a single IP solution
- IP based solution, transport independent
- No Inter-AS complexity
- Overlay solution is transparent to the core
Network Virtualization in LISP

LISP Multi-tenancy

Virtualized Map Cache (xTRs):
- Mappings cached in different VRFs per instance-id
- Interoperable with other VRF features/solutions

Virtualized Mapping Service:
- EID entries with instance-id semantics
- Control packets also contain instance-id semantics

“Colored” Traffic:
- Instance-ID tag in LISP data header
- Instance-ID encoded in LISP control packets
- Coloring is transparent to the core

<table>
<thead>
<tr>
<th>Instance</th>
<th>EID IP</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>A</td>
<td>East</td>
</tr>
<tr>
<td>Blue</td>
<td>A</td>
<td>West</td>
</tr>
<tr>
<td>Yellow</td>
<td>C</td>
<td>East → West</td>
</tr>
</tbody>
</table>

“Colored” Map Requests/Replies:

To MPLS VPNs, VRF-lite or separate networks

Single RLOC space shared by multiple instances

To LISP
Segmentation end-to-end

LISP-VRF integration

Legend:
- EIDs -> Green
- Locators -> Red
- LISP encap/decap

Single RLOC space shared by multiple instances
VRFs and LISP Multi-Tenancy

Routes and Mappings in VRFs

- On a PITR, routes can be advertised on different VRFs

- Leverage VRF enabled functionality:
  - PBR VRF-select
  - DHCP relay
  - ExTRanet
  - Imports/Exports
  - IGP/BGP routing protocols

- Interoperate with existing VPN networks
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Where to Deploy LISP and OTV
Roles and Places in the Network

xTR: Branch Routers @ LISP Sites
• Customer-managed/owned
• SP-Managed CE service

PxTR: Border Routers @ Transit Points
• Customer backbone routers
• Customer router @ co-location
• SP provided router/service

LISP-VM xTR: Aggregation Routers @ Data Center
• Customer-managed/owned

Mapping Servers/Routers: Distributed Across Data Centers
• Customer-managed/owned
• SP provided service

OTV: Aggregation Routers @ Data Center
• Customer-managed/owned

LISP Encap/Decap
RLOC
EID
PxTR
xTR
Mapping DB
LISP Site
Internet / WAN Backbone
Data Center IP Backbone
DC-Aggregation
DC-Access
West-DC
East-DC
Mapping DB
LISP-VM (xTR)
LISP-Host-Mobility Router Placement

- @ Main Data Centers
- @ Disaster Recover facilities
- Ideally: First hop routers for the subnets in which the mobile hosts reside:
  - Detect host moves
  - Provide a consistent first hop presence
  - Could also be the second hop
- Usually the Aggregation Switches in the Data Center
- Customer Managed
OTV Router Placement

- @ Main Data Centers only
- Typically not required @ Disaster Recover facilities
- First hop routers for the subnets in which the mobile hosts reside:
  - Connect to the VLANs to be extended
  - Connect to the IP core
- Usually the Aggregation Switches in the Data Center
- Customer Managed

LAN Extension to DR or Cloud Facilities Is Usually Not Required
PxTR Placement
Advertise DC Routes to Non-LISP Sites

- PxTR Ideally placed on path between non-LISP and LISP sites
- Aggregation points are optimal:
  - Border routers between DC core and WAN
  - Internet Routers
  - Customer Routers at Co-location
  - Provider routers (PxTR service)
- PITRs must be configured to inject routes into the non-LISP network
  - Attract traffic from Non-LISP sites
  - Encap and send to the Data Center
Map Server Placement
A Daemon on a Router

- The Map Server functionality can be enabled on any router
  - BGP route-reflectors are a good analogy
  - Off path is good, but not mandatory

- Distribute Map Servers across different locations
  - Private Data Centers (Self managed)
  - SP Data Centers/Cloud (SP Service)

- Map Server resiliency options:
  - Clustered and distributed
  - Distributed Database (ALT or IMDB)
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Cold Moves / Disaster Recovery
Localized FW & SLB Clusters

- Independent FW & SLB cluster in each location
  LAN extensions not required
- New state created after moves
  No state synchronization
- LISP steers traffic to different locations
- Disaster recovery
- Cold workload relocation
Live Moves
Extended Firewall Clusters – All Active

- FW cluster extended across locations
  - LAN extensions for heartbeats & state sync
- FW state is synchronized across all cluster members
- All members active: Any member can support any flow
- LISP steers traffic to different locations
Service State Mobility Virtual Services Gateway (VSG)

- VSG uses the vPath model
- FW policies are maintained centrally
- FW state/enforcement is distributed to the hypervisor switch
- FW state moves granularly with each VM

LAN Extensions
- ACE Cluster Extension
- Cross Site Load Balancing
- Moves Trigger ACE VIP Update, Detected by ETR
- Firewall Policies Enforced per VM by VSG
- FW Policies Move with the VMs
ACE Virtual-IP (VIP) Failover

- VIP is active at one location at a time
- VIP location is advertised in LISP
- VIP may failover on failure or change active device on machine moves
  - VIP becomes active at a new site
- VIP activity is detected by the VM-mobility logic
- VIP location is updated in LISP on failover
Summary and Conclusions
Summary and Conclusions

- A combination of LISP and LAN Extension technologies is required by most data center deployments
- OTV provides a secure and optimized option for LAN extensions
- LISP consolidates many network services in one architecture:
  - Mobility, network segmentation, traffic engineering
  - Enhanced scalability
- LISP and OTV are available today across a wide range of products
Recommended Reading

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We value your feedback

- Don't forget to complete your online session evaluations after each session. Complete 4 session evaluations & the Overall Conference Evaluation (available from Thursday) to receive your Cisco Live T-shirt

- Surveys can be found on the Attendee Website at www.ciscolivelondon.com/onsite which can also be accessed through the screens at the Communication Stations

- Or use the Cisco Live Mobile App to complete the surveys from your phone, download the app at www.ciscolivelondon.com/connect/mobile/app.html

1. Scan the QR code (Go to http://tinyurl.com/qrmelists for QR code reader software, alternatively type in the access URL above)
2. Download the app or access the mobile site
3. Log in to complete and submit the evaluations
Thank you.