Best of both worlds: Network Virtualization and KVM

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About Midokura…
Midokura is ...

1.5 (years old)
Midokura is …

3 +

(country offices)
Midokura is …

13+ (members)
Midokura is ...

2
(core products)
MidoNet / MidoStack

**MidoNet**
- Network Virtualization platform

**MidoStack**
- Cloud service suite (OpenStack based) including network virtualization (MidoNet), distributed storages, etc.
- We’re using KVM!
Why Network Virtualization?
Why Network Virtualization?

The Bottleneck
Why Network Virtualization?

- Lots of VMs running on shared infrastructure
- Delegate control
- Ephemeral resources
- On Demand
VLAN != Virtual Network

- Complicated to manage
- Single security domain
- Not ephemeral
- Not scalable
- No network services
Our Proposal

Network as a Service

- Network resources on demand
- Agile and flexible
What are the benefits?

- Decoupling from underlying hardware
  - Virtual topologies independent from physical

- Isolation
  - Separate addressing, security, QoS

- Delegated control via API
  - Tenants can manage

- Ephemeral virtual resources
  - Create and destroy at will, like Virtual Machines

- Network Services integrated
  - Routing, Firewall, Load Balancer
Virtual iDC: Overview
Virtual iDC: Physical topology
Principles of Design

- Intelligence at the edge
- Scalable and simple core
  - Fabric made of simpler and cheaper devices
- Software vs hardware
  - More flexibility, extensibility, and scalability
- Scale out rather than up
  - Pay only for what you use
  - Shut off what is not being used
  - Save energy
Virtual Switch + One VM
What happened behind the scene?
What happened behind the scene?

Distributed State

- MidoNet
- REST API

Dashboard
What happened behind the scene?

Distributed State
What happened behind the scene?
What happened behind the scene?

Distributed State

VM

MidoNet

OVS

Linux

HW

VM

MidoNet

OVS

Linux

HW
What happened behind the scene?
What happened behind the scene?

Distributed State

VM -> MidoNet -> OVS -> Linux -> HW

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Distributed State

VM
MidoNet
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Linux
HW

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Distributed State

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OVS

Linux

HW

VM

MidoNet

OVS

Linux

HW
What happened behind the scene?

Distributed State

VM  MidoNet  OVS  Linux  HW

VM  MidoNet  OVS  Linux  HW

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What happened behind the scene?

Distributed State

VM
MidoNet
OVS
Linux
HW

VM
MidoNet
OVS
Linux
HW
Advanced Use Case: KVM Live Migration
Advanced Use Case: KVM Live Migration

- The problem when migrating the network
  - Gratuitous ARP is sent to migrate the network
  - Packets may get lost until the path is ready
Advanced Use Case: KVM Live Migration

- Live Migration w/o dropping packets?
Advanced Use Case: KVM Live Migration

- Live Migration w/o dropping packets?
  - VM and Virtual Network can be orchestrated!
Advanced Use Case: KVM Live Migration

- Start Live Migration
  - Packets delivered only to the src host as usual
Advanced Use Case: KVM Live Migration

- Start **Port Mirroring** before completing the migration
  - Packets delivered to both Src/Dst hosts
Advanced Use Case: KVM Live Migration

- End Port Mirroring and remove the virtual port on the src host
  - Packets delivered only to Dst hosts
Conclusion

- Network Virtualization enables true Cloud computing platform
  - Users can easily get their own network resources on demand, just like VMs

- MidoNet = Network Virtualization platform
  - Provides L2, L3, Firewall and Load Balancer
  - Scalable and Fault Tolerant
Looking for Users and Partners!

- Already started deploying the products to some partners’ and customers’ environments

- Please sign up for our beta!
  - [http://www.midokura.com/beta.html](http://www.midokura.com/beta.html)
Thank You!