

# Best of both worlds: Network Virtualization and KVM

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# About Midokura...

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# Midokura is ...

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1.5  
(years old)



# Midokura is ...

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3 + (country offices)



# Midokura is ...

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13+  
(members)



# Midokura is ...

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**2** (core products)



# MidoNet / MidoStack

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- MidoNet

- ▶ [Network Virtualization platform](#)

- MidoStack

- ▶ Cloud service suite (OpenStack based) including network virtualization (MidoNet), distributed storages, etc.
- ▶ We're using KVM!



# Why Network Virtualization?

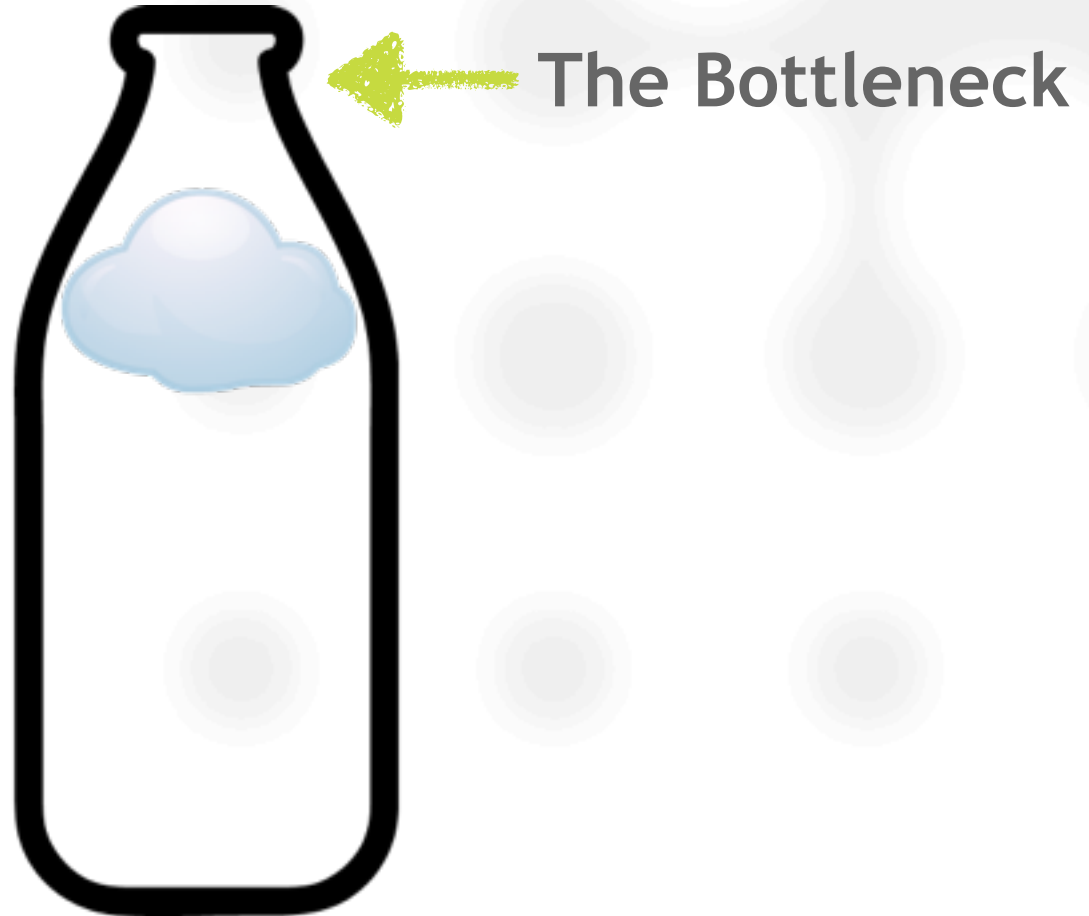
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# Why Network Virtualization?

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# Why Network Virtualization?

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- Lots of VMs running on shared infrastructure
- Delegate control
- Ephemeral resources
- On Demand



# VLAN != Virtual Network

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



# Our Proposal

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- Network as a Service
  - ▶ Network resources on demand
  - ▶ Agile and flexible

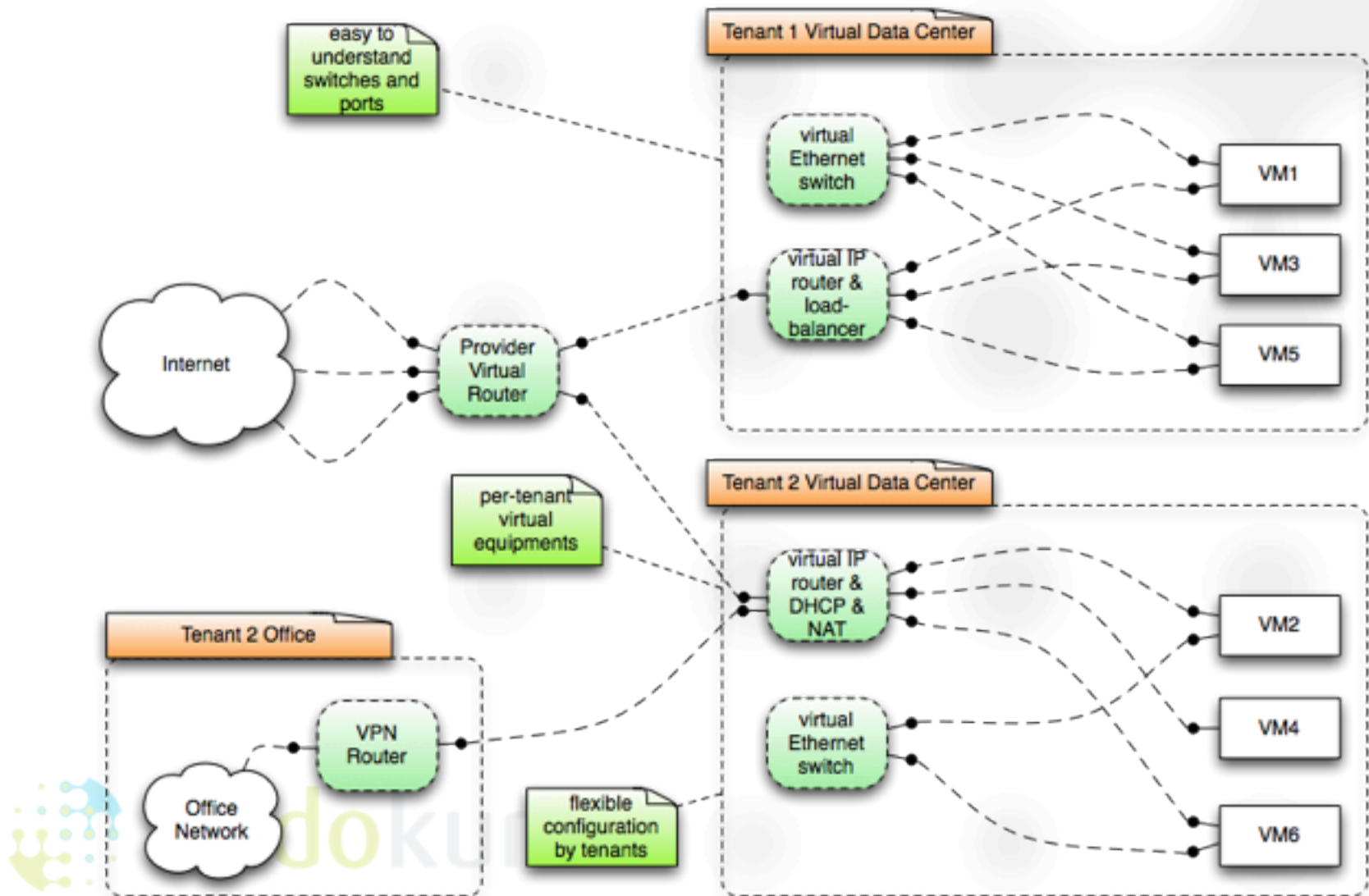


# What are the benefits?

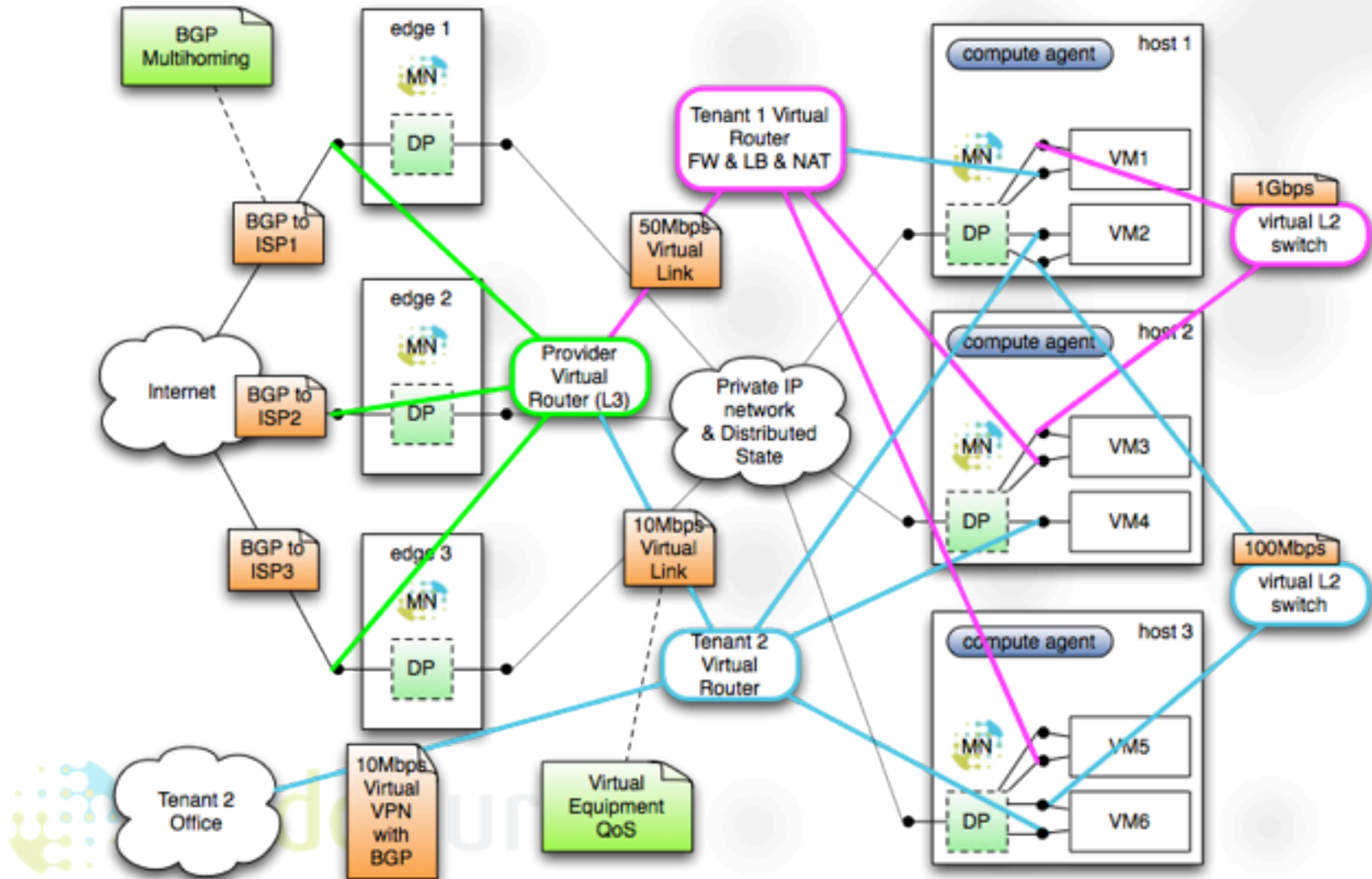
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- Decoupling from underlying hardware
  - ▶ Virtual topologies independent from physical
- Isolation
  - ▶ Separate addressing, security, QoS
- Delegated control via API
  - ▶ Tenants can manage
- Ephemeral virtual resources
  - ▶ Create and destroy at will, like Virtual Machines
- Network Services integrated
  - ▶ Routing, Firewall, Load Balancer

# Virtual iDC: Overview



# Virtual iDC: Physical topology



# Principles of Design

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- 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



# Demo

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# Demo

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Virtual Switch + One VM



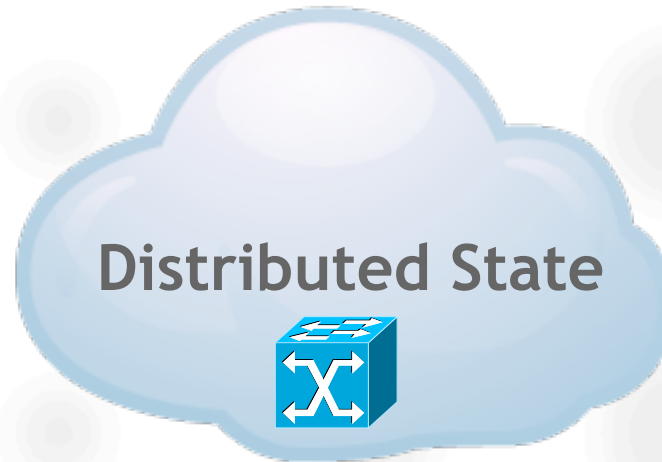
# What happened behind the scene?

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# What happened behind the scene?

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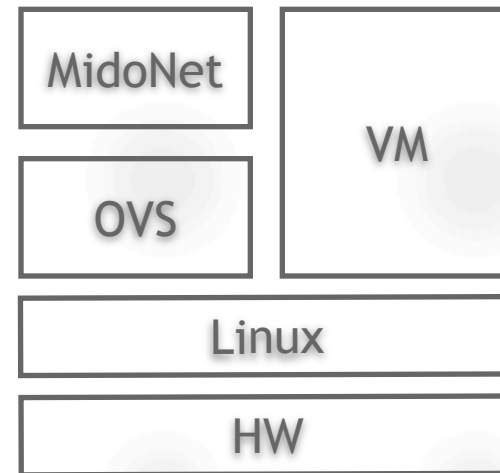
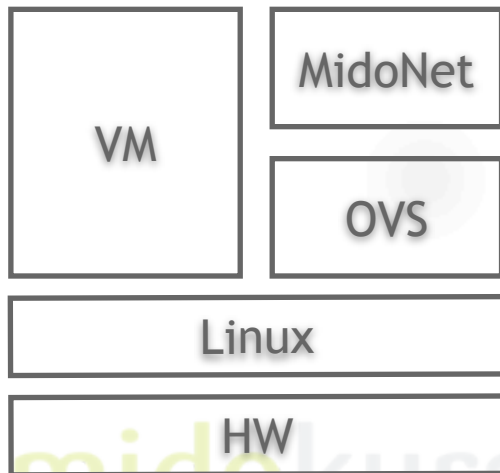
Dashboard



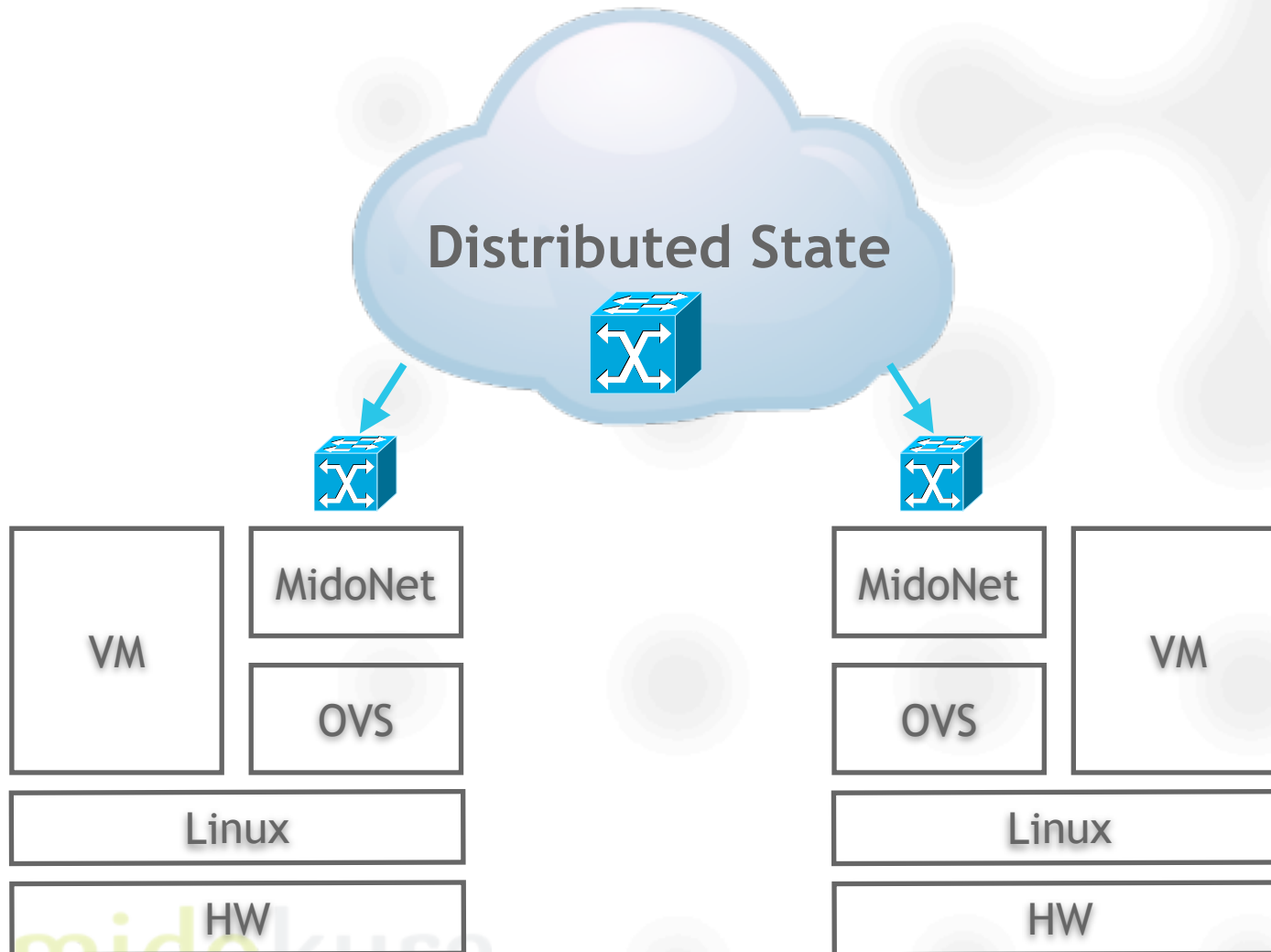
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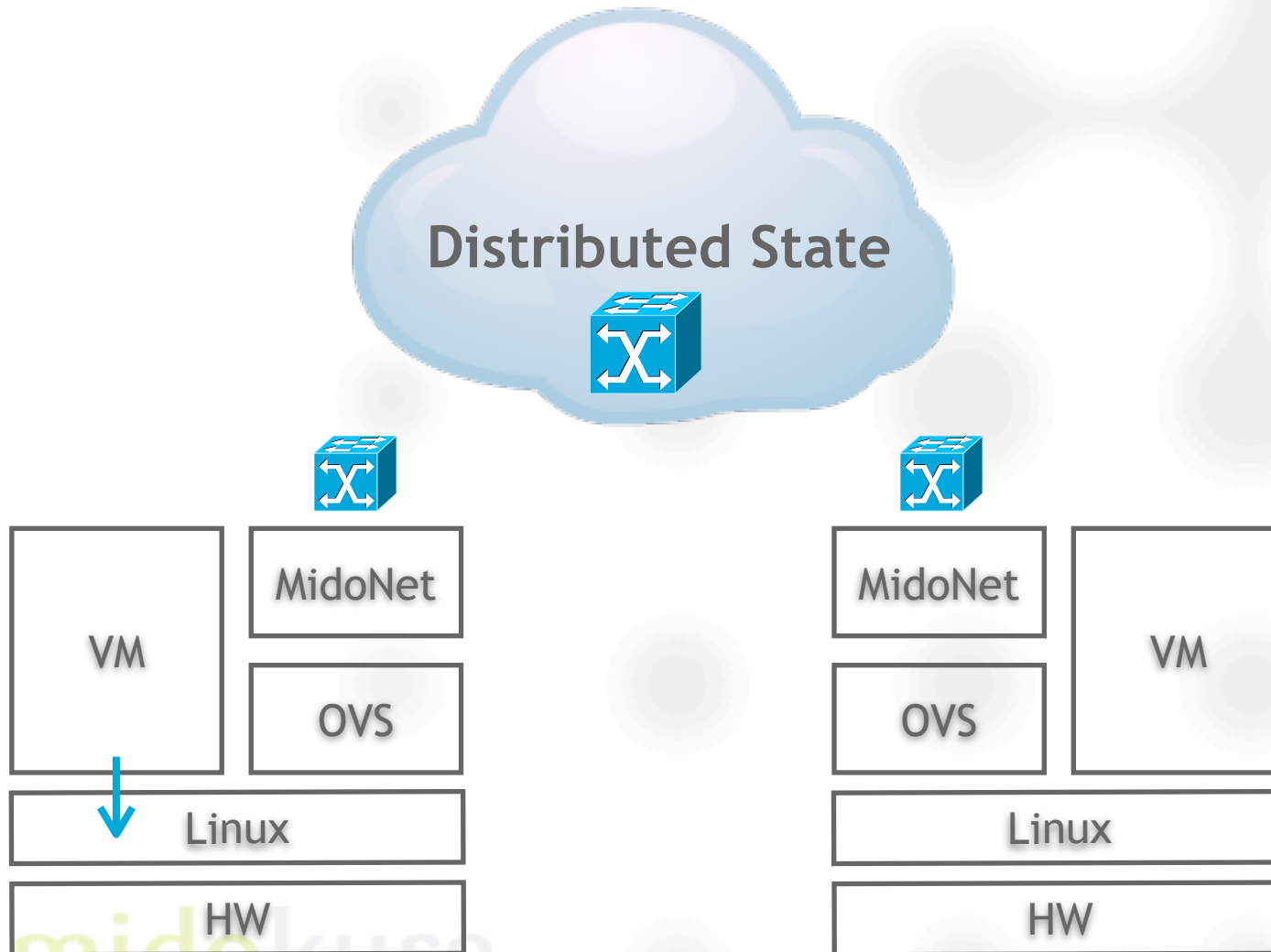
Distributed State



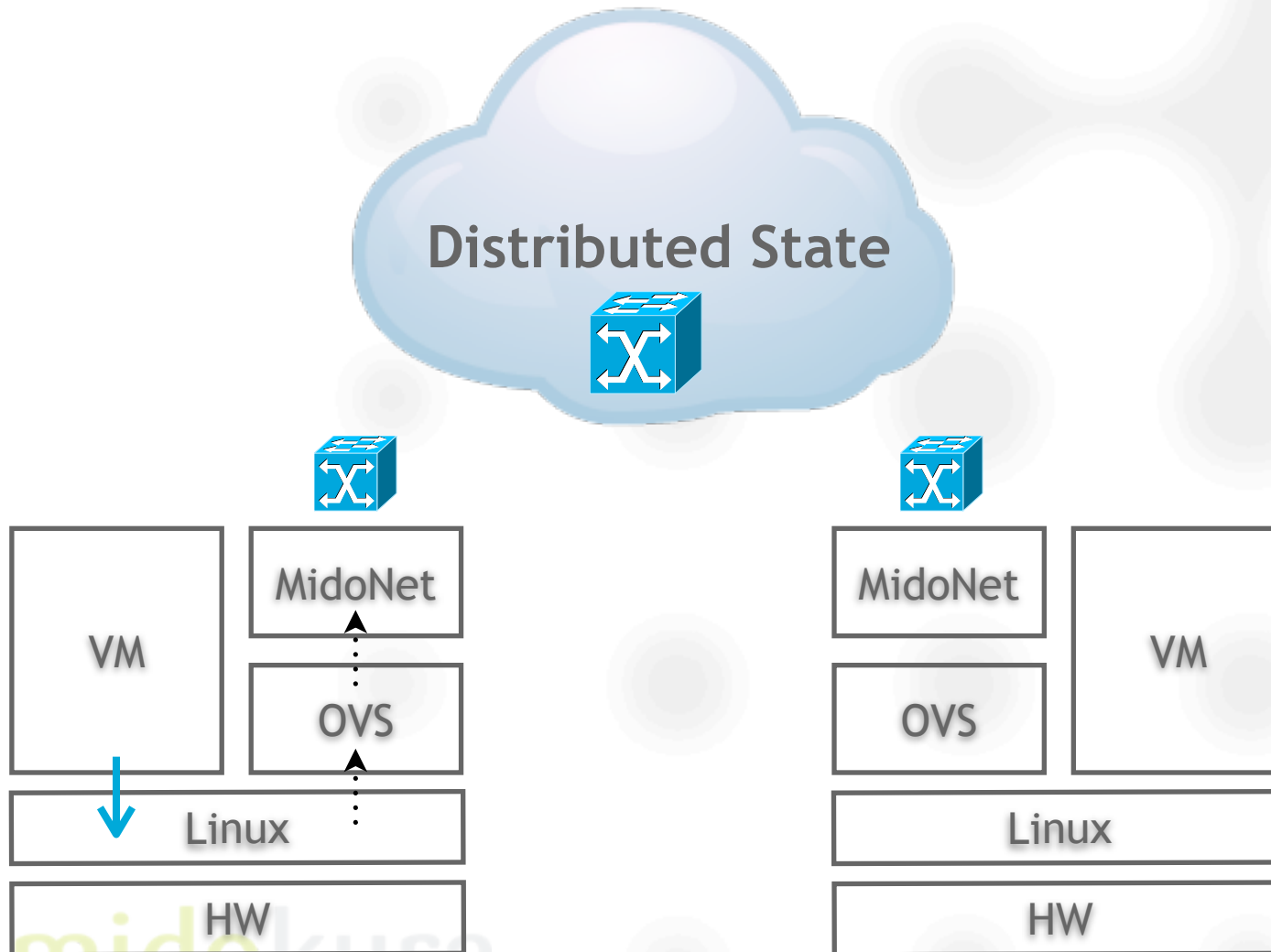
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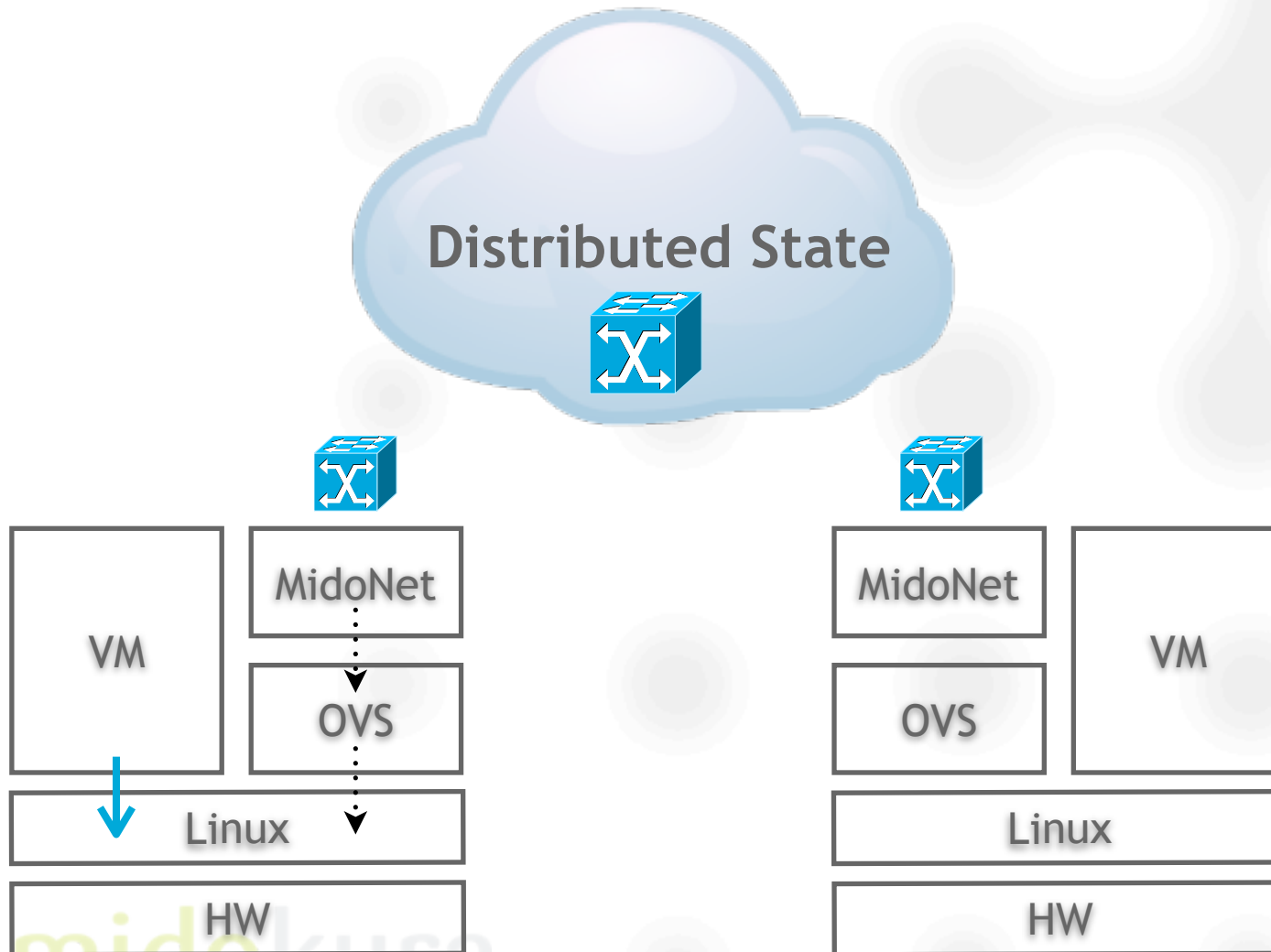


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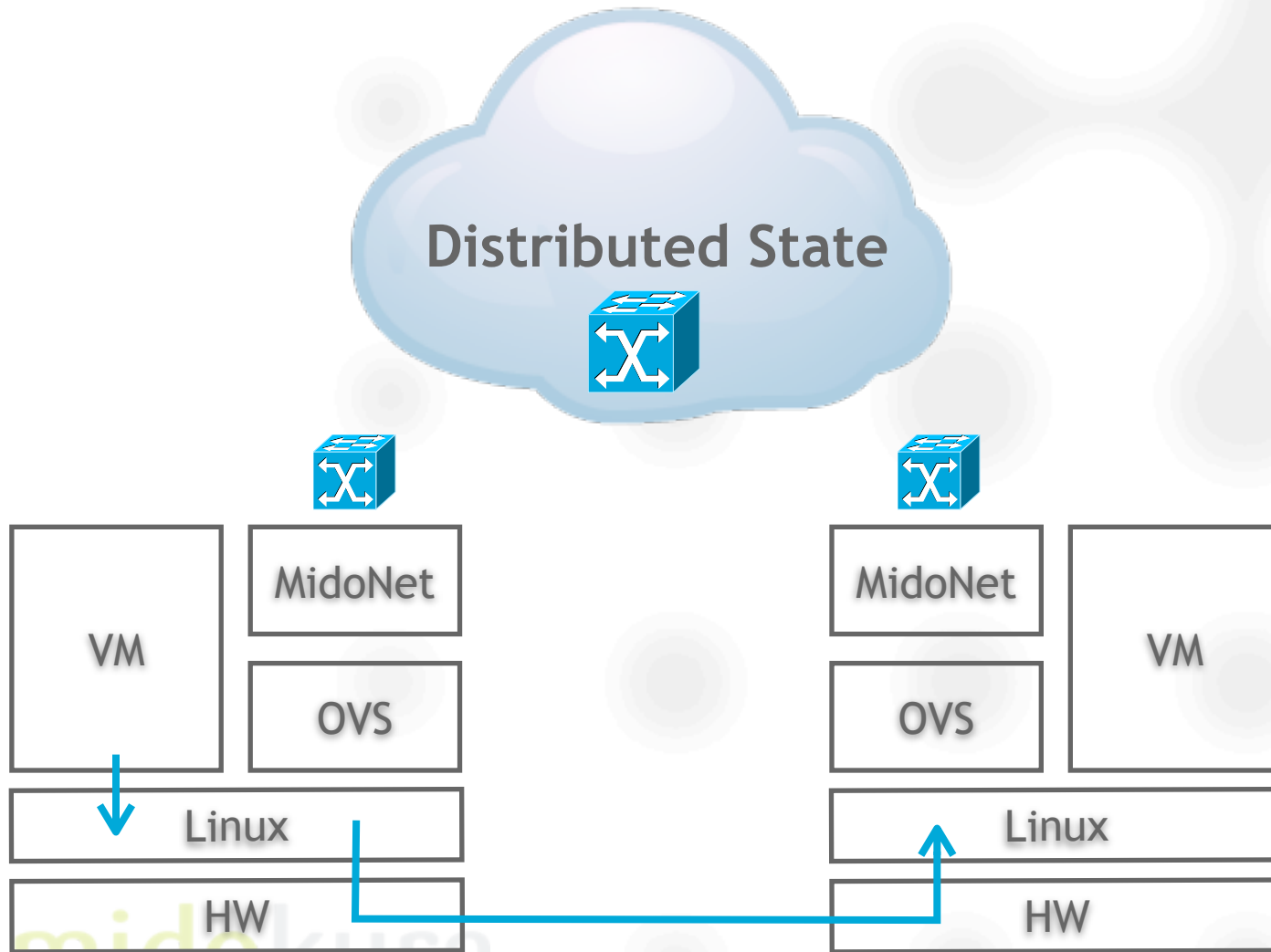




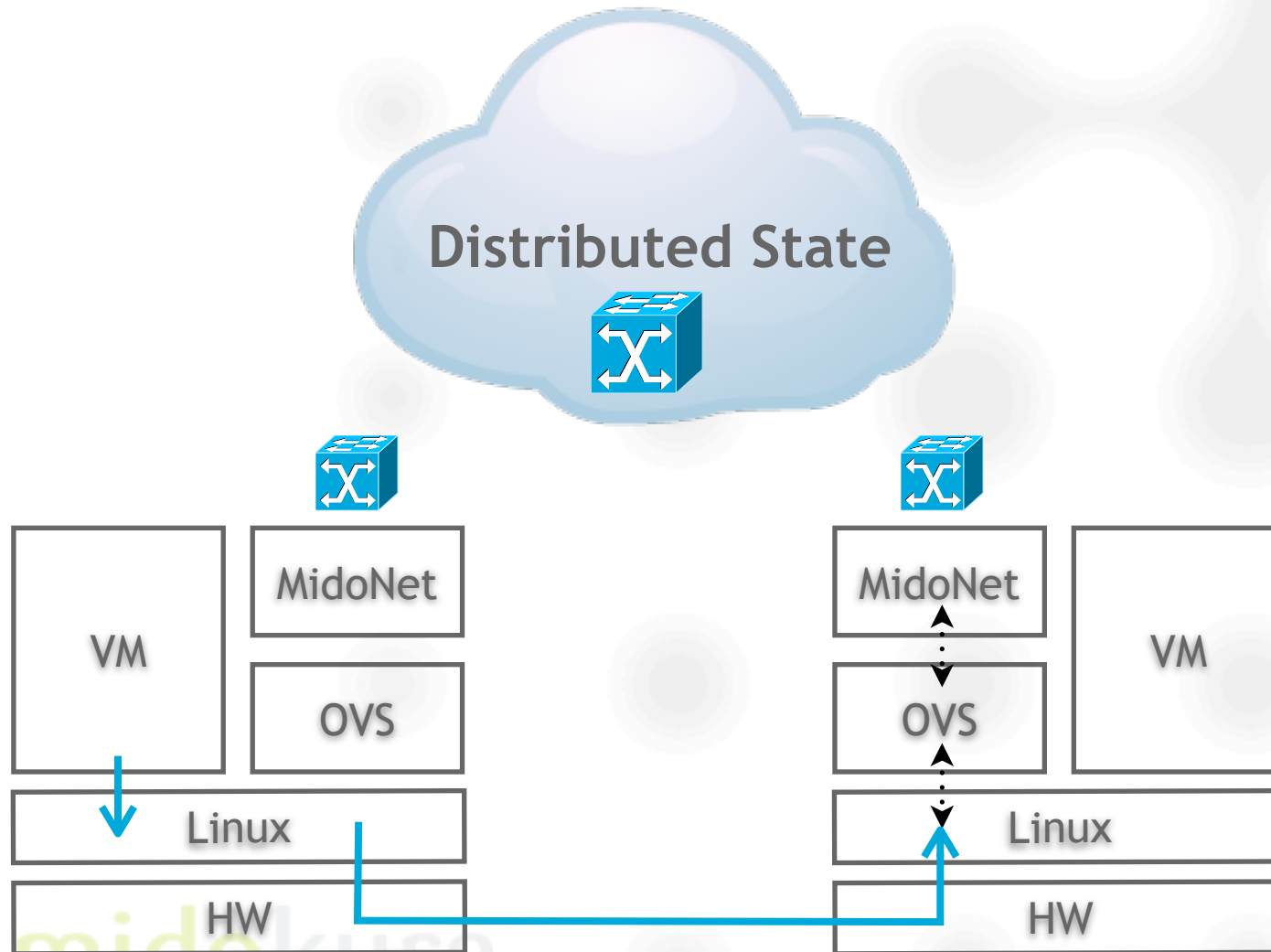
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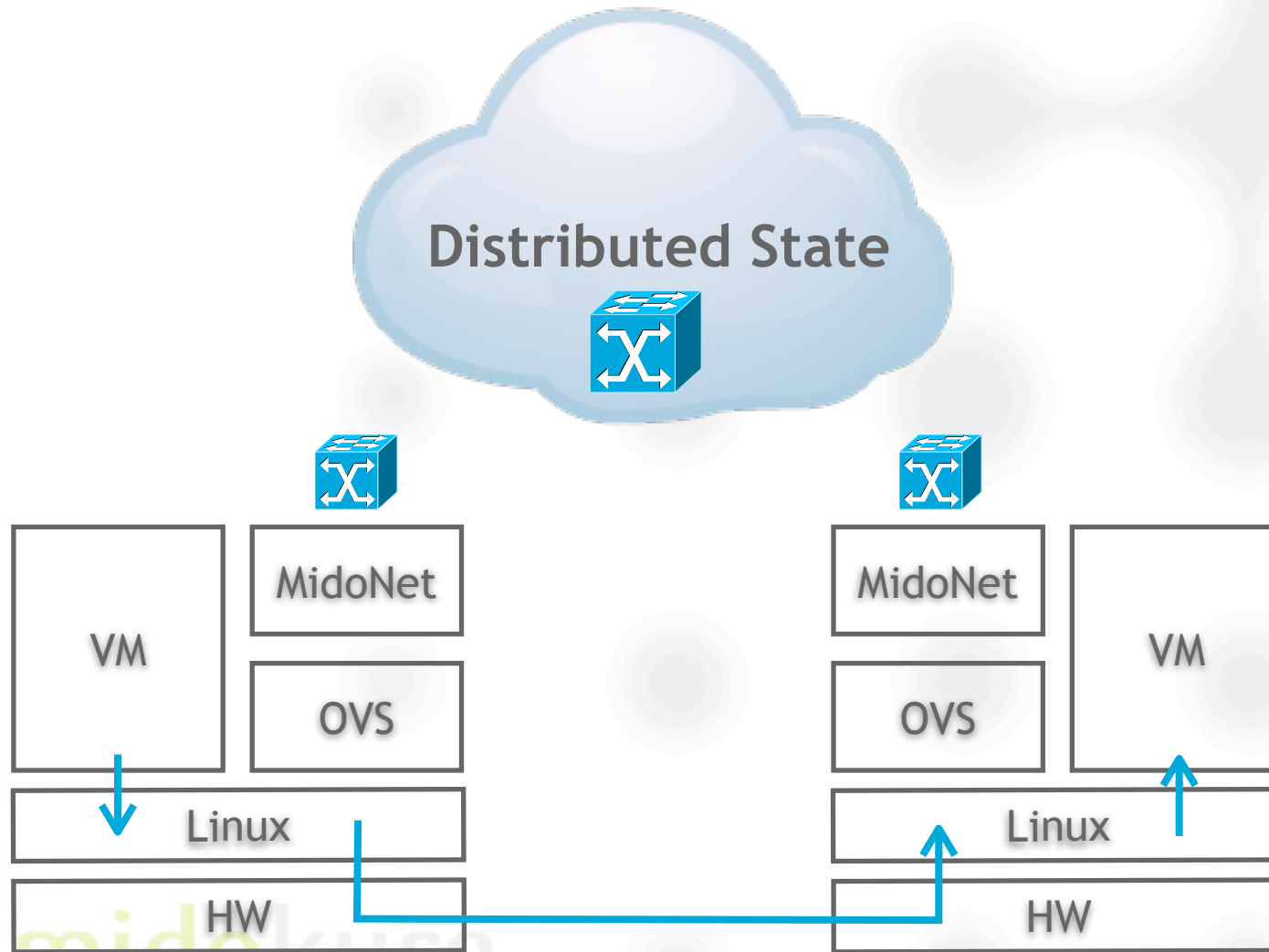
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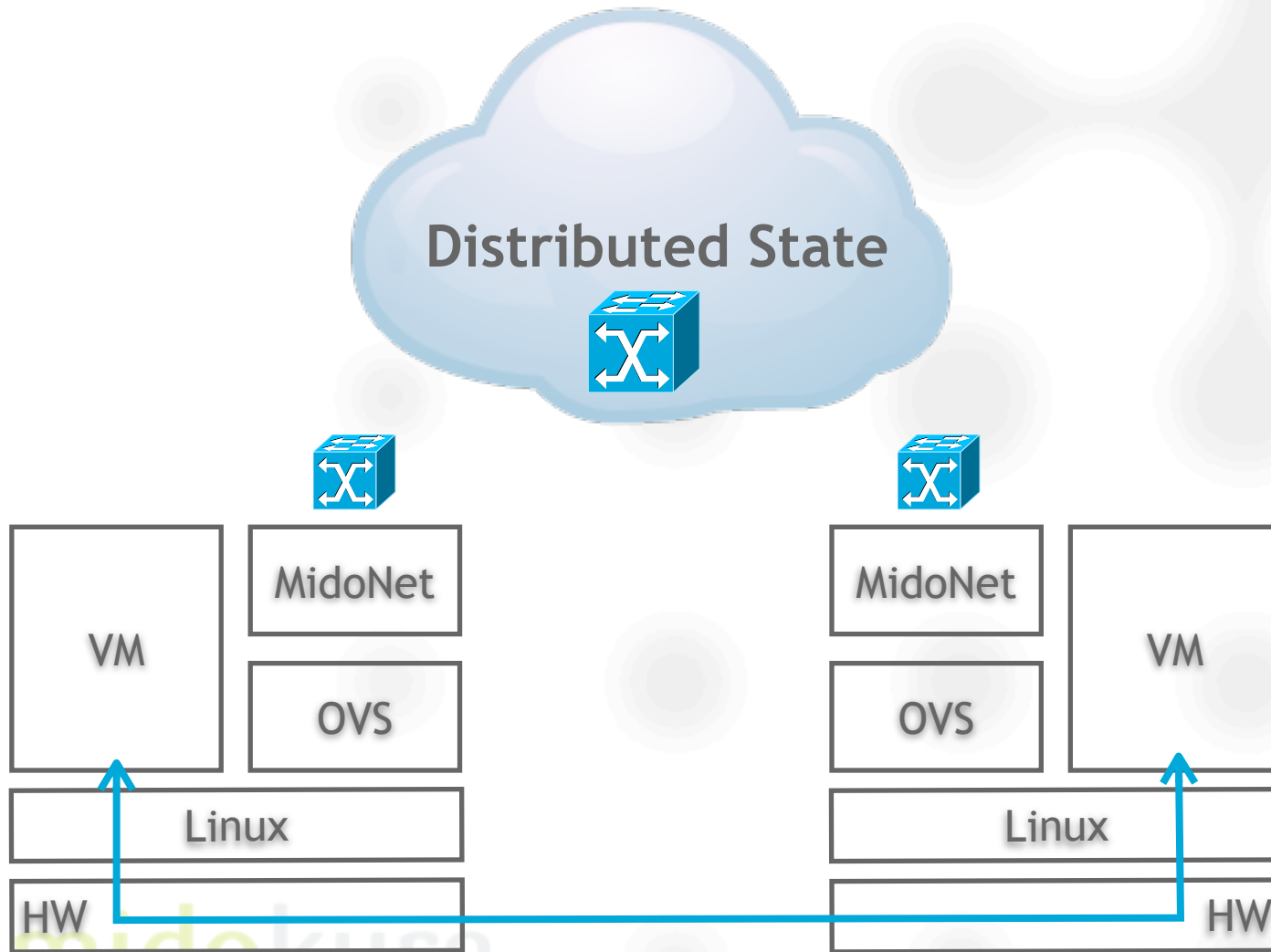
# What happened behind the scene?



# What happened behind the scene?



# What happened behind the scene?



# Advanced Use Case: KVM Live Migration

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# Advanced Use Case: KVM Live Migration

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- 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

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- Live Migration w/o dropping packets?





# Advanced Use Case: KVM Live Migration

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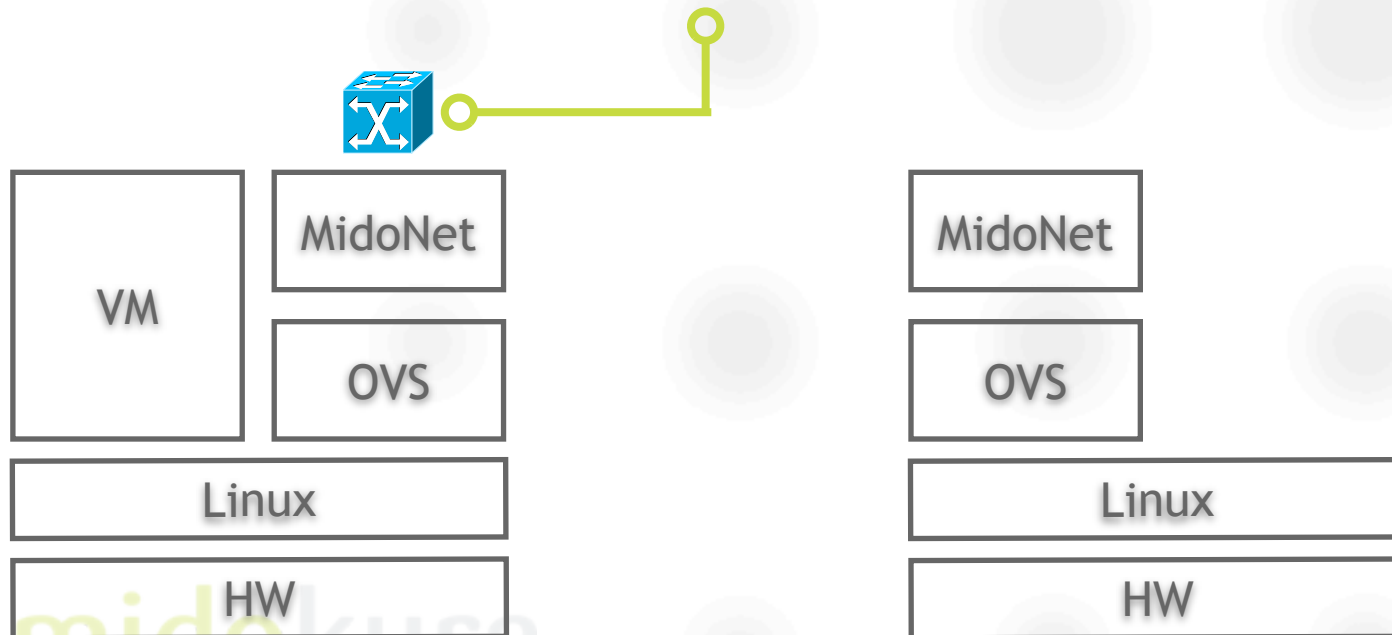
- Live Migration w/o dropping packets?
  - ▶ VM and Virtual Network can be orchestrated!



# Advanced Use Case: KVM Live Migration

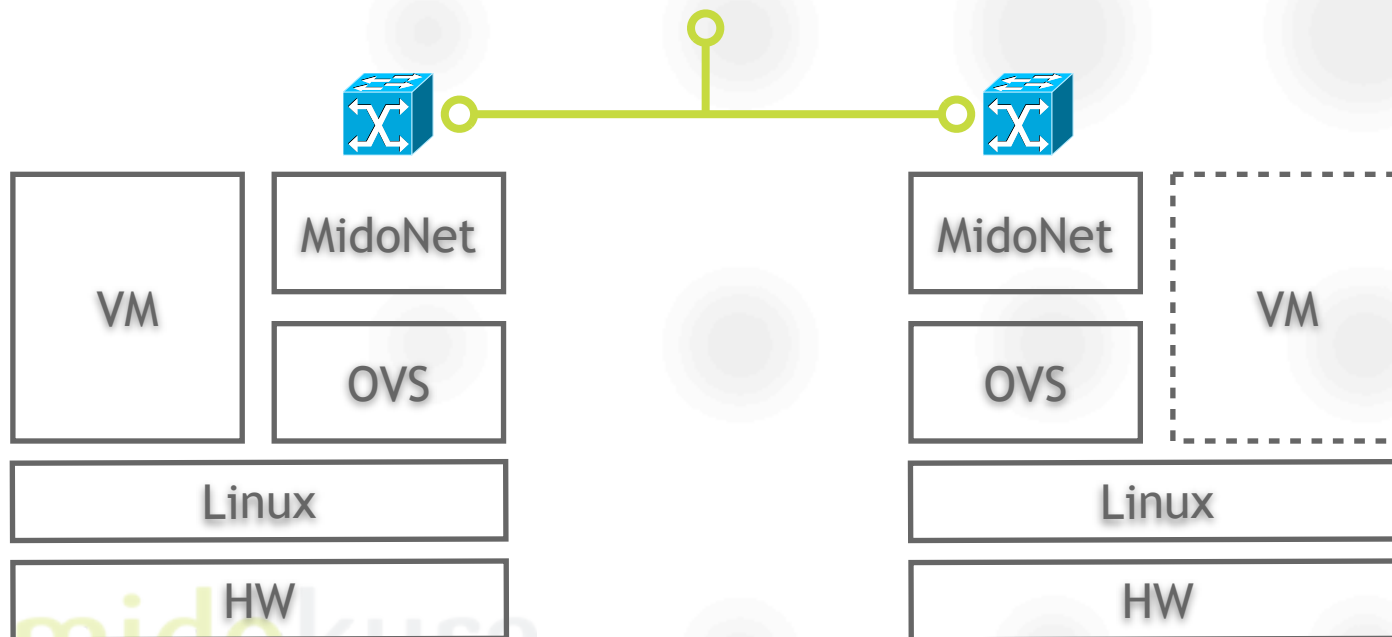
## ■ Start Live Migration

- ▶ 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

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- 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!

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- Already started deploying the products to some partners' and customers' environments
- Please sign up for our beta!
  - ▶ <http://www.midokura.com/beta.html>



**Thank You!**

