LimeVI: a Platform for Virtual Cluster Live Migration over WAN

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Overview

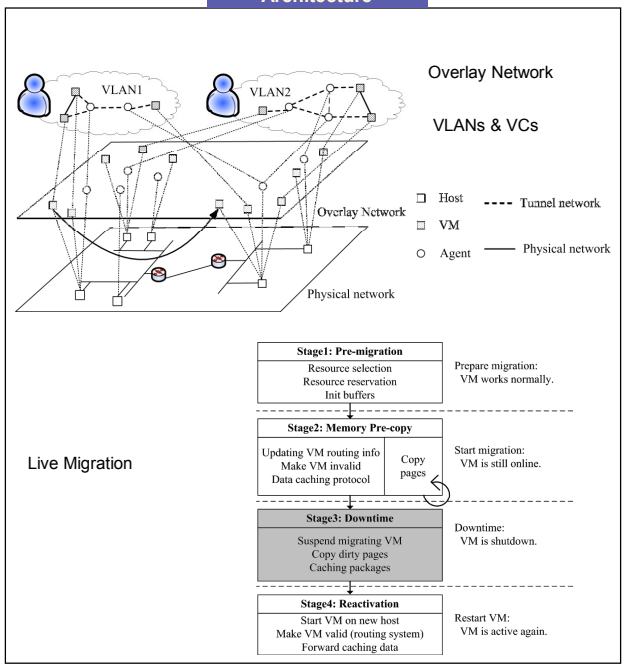
Virtual Infrastructure (VI) - "a shared distributed infrastructure that provides both OS level virtualization tools and high level virtualized system component, such as virtual network, virtual resource management and virtual resource scheduler, etc., to support isolated and customized virtual executing environments for various user applications"

LimeVI - a Platform supporting Virtual Cluster (**VC**) live migration over WAN

Unsolved Problems:

- Tunnelling efficiency of VIs.
- Potential package loss
- Live Migration Protocol for VC

Architecture

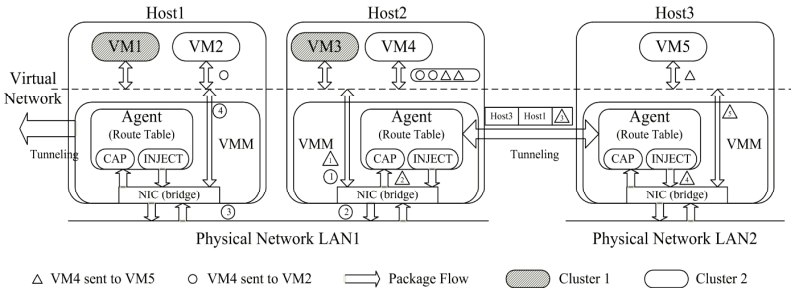


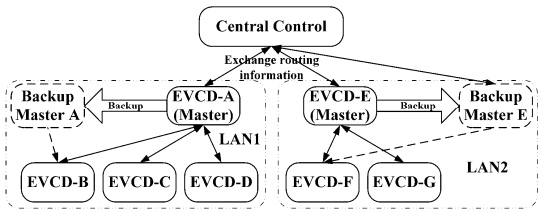
Virtual Network

Hybrid Virtual Network:

- **Transparent** from front-end consumers
- **Dynamically** changeVM resource mapping
- Multiple **Isolated** VLANs & VCs

Communication tunnels & Virtual network routing





HostA Routing Table (downtime)

VM	Host(router)	Status	VCID	LANID	...
VM2	HostB	Valid	VC1	LAN1	...
VM5	HostE	Valid	VC2	LAN3	...
...	...	...	...	...	...
VM8	HostC	Invalid	VC1	LAN2	...

Routing Table (After migration)

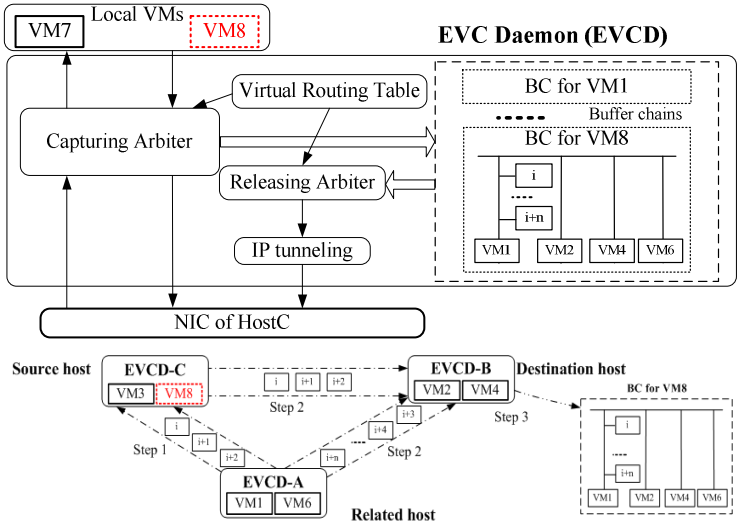
VM	Host(router)	Status	VCID	LANID	...
VM2	HostB	Valid	VC1	LAN1	...
VM5	HostE	Valid	VC2	LAN3	...
...	...	...	...	...	...
VM8	HostB	Valid	VC1	LAN1	...

Data Buffer Mechanism

Data Buffer Mechanism:

- **Store** communication messages concerning migrating VM(s)
- **Prevent** package loss

Data Structure & Buffer Transfer



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