

# Virtual Machine Isolation

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## Control of Resource Consumption

- Share/limit CPU and network bandwidth
- Hard limit on memory (RAM) utilization
- Control IO bandwidth to local/remote disks
- Better monitoring/accounting of these resources

## Isolation of Virtual Machines

- Control address connectivity (what machines can see the VM?)
- Control what ports are accessible on a VM
- Dynamic control of both connectivity and ports

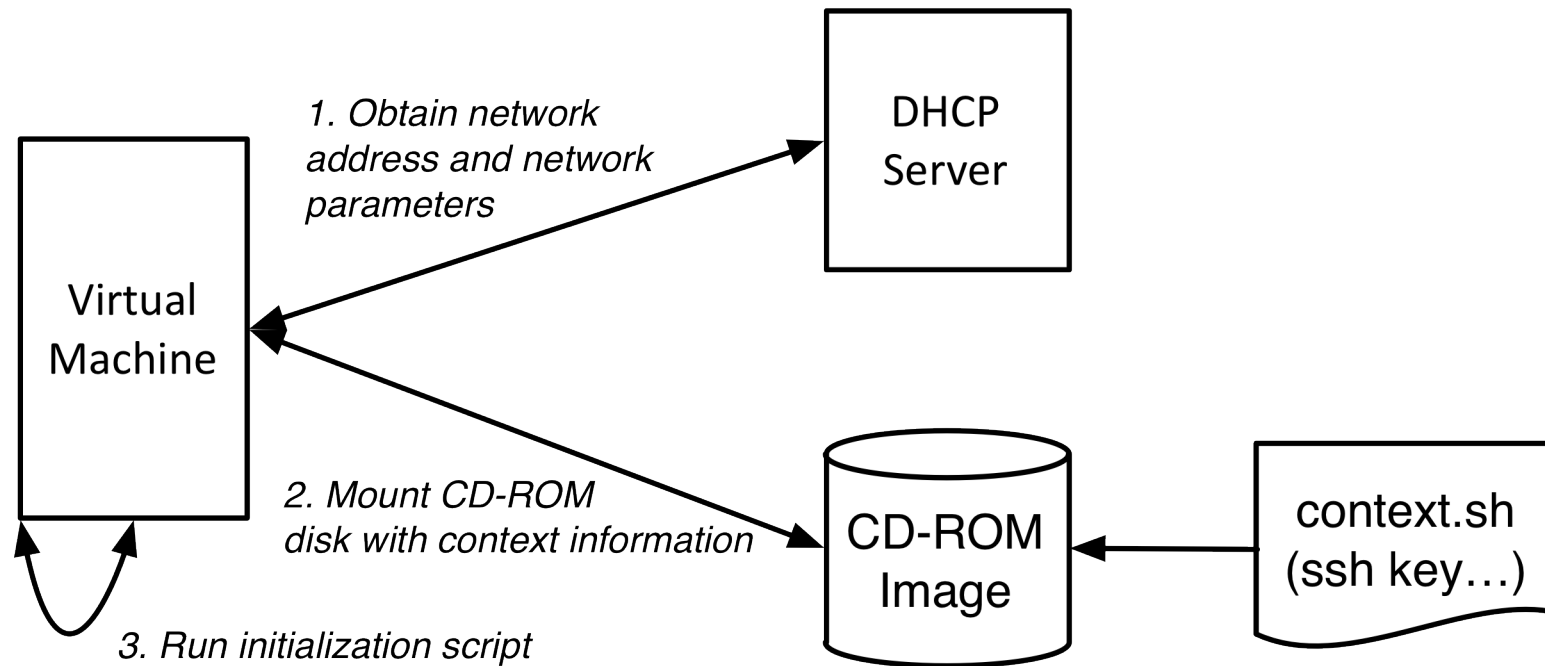
## Static Configuration

- No dynamic VLAN or firewall configuration
- Three classes of IP addresses (public, local, and private)
- All machines receive network information via DHCP

		INBOUND			
		<i>External</i>	<i>Public</i>	<i>Local</i>	<i>Private</i>
OUTBOUND	<i>External</i>	?	✓	✗	✗
	<i>Public</i>	✓	✓	✓	✗
	<i>Local</i>	NAT	✓	✓	✗
	<i>Private</i>	NAT	✓	✓	✗

## Discovery of VM Context

- Network connections (DHCP)
- Authentication/Authorization (SSH Keys)
- Service Configuration (e.g. Grid Certificates)



# Questions and Discussion

Exercises:

- 1) Start a machine with ubuntu image, start web server, customize the index.html page, verify that you can see the modified page in your browser.
- 2) Start up a couple of machines with different types of IP addresses. Use ping/ssh to determine the connectivity from outside of the cloud and from within the cloud.
- 3) Pass additional parameters via the contextualization mechanism. Log into machine and verify that the new parameters are there.

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