



## **Advanced Topics**

StratusLab Tutorial (Orsay, France)

28 November 2012



## 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

# Contextualization



## Horrible word but...

- Machines must be able to run in variable network/machine contexts
- Information on how to integrate with local context must be given to VM
- No universal standard for doing this (StratusLab, HEPiX, AWS, ...)

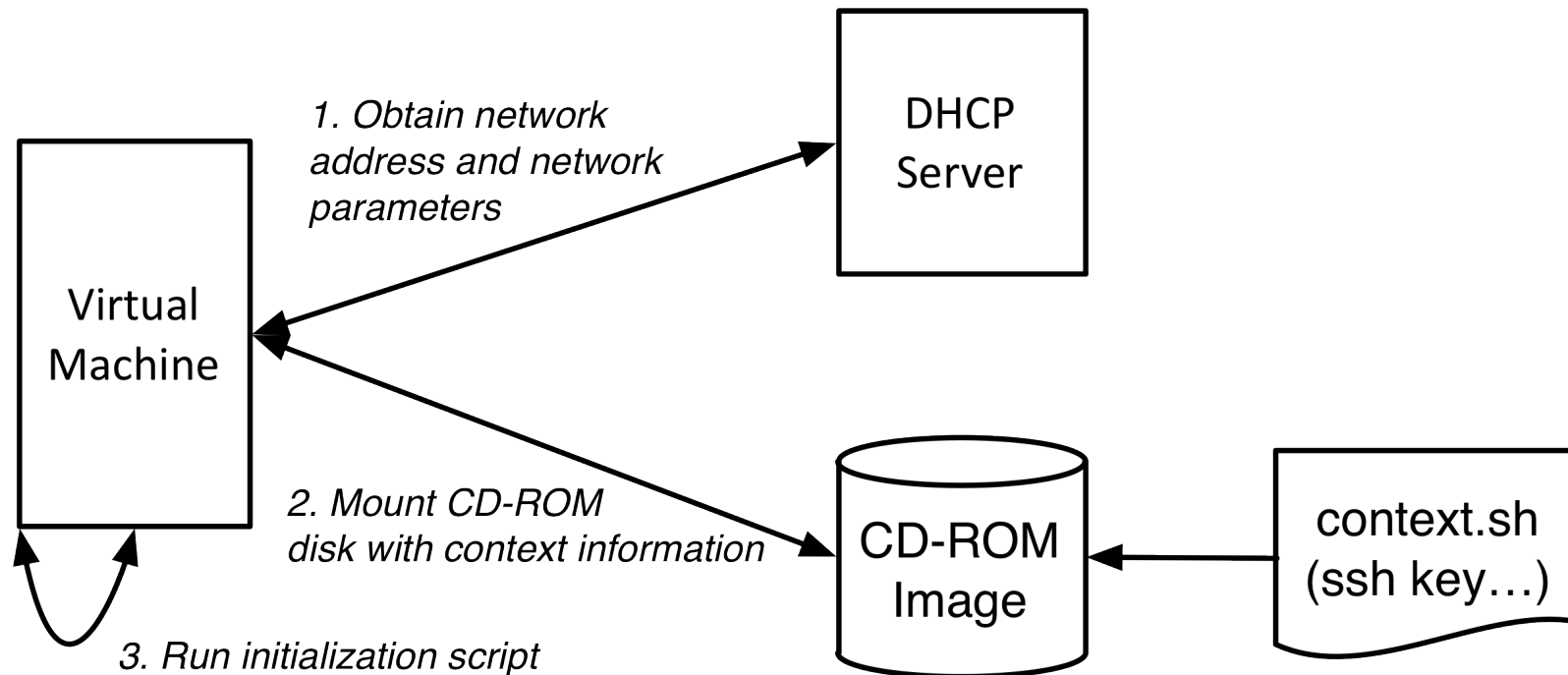
## StratusLab Contextualization

- Information packaged into CD-ROM image and made available to VM
- VMs mount CD-ROM image and run a script using context information
- Networking information is passed exclusively via DHCP
- Additional information can be passed to VMs to configure services

# Contextualization

## Discovery of VM Context

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





## Limit Access

- Limit ssh access to known users with ssh keys
- Do not add accounts with password access

## Best practices

- Only run services on your VM that are necessary
- Setup and use a firewall within the VM

# StratusLab Network Configuration



## Static Configuration

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

### **TO MACHINE**

		<i>External</i>	<i>Public</i>	<i>Local</i>	<i>Private</i>
<b>FROM MACHINE</b>	<i>External</i>	?	✓	✗	✗
	<i>Public</i>	✓	✓	✓	✗
	<i>Local</i>	NAT	✓	✓	✗
	<i>Private</i>	NAT	✓	✓	✗

---

# Questions and Discussion

# Exercises: Contextualization



## Discover Contextualization Procedure

- Log into a VM and find CD-ROM image.
- What files are present?
- What information is passed to machine?
- How is that information used within the machine?

## Modify the Context

- Look for command line option to send user-defined context
- Send some customized information via the context
- Verify that the information can be found on the running machine
- How could you use this to configure your services?





<http://www.stratuslab.eu>

Copyright © 2012, Members of the StratusLab collaboration.

This work is licensed under the Creative Commons Attribution 3.0 Unported License (<http://creativecommons.org/licenses/by/3.0/>).

