



## **Network Configuration**

Charles (Cal) Loomis & Mohammed Airaj

LAL, Univ. Paris-Sud, CNRS/IN2P3

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# Network



**Networking is a crucial component of any cloud. It is needed so that users can actually access the cloud resources, but also needs to be configured to protect the cloud services.**

**The “correct” network configuration depends on the type of deployment (i.e. what users will be accessing it) and your site’s security constraints.**

**StratusLab does not use or require dynamic configuration of the underlying network.**



## Private Cloud

- Small number of known and trusted users, e.g. admins using a cloud for deploying site services.
- Can have single open network between physical machines hosting cloud services and running virtual machines

## Public Cloud

- Larger number of users that are less trusted (either because of lack of admin experience or ...)
- Minimum two different networks/VLANs: one for physical machines with cloud services, one for virtual machines
- Ideal if networks can also be physically separated (multiple cards, network bonding, etc.)



## Cloud Services

- Open access to service ports to site (private) or to world (public)
- Open internal service ports only to the necessary nodes
- Block access to all other ports from all nodes

## Virtual Machines

- Open all ports to virtual machines by default
- Let users control access to VMs via internal firewalls

# Standard StratusLab Network Configuration



## Features

- Support 3 specific use cases: public service (public), batch system (local), and BOINC-like worker (private)
- Requires only static configuration of network switches
- Usual services for VM network configuration

## Implementation

- No API: manual, static configuration of network
- Recommended config.: separate VM and cloud services networks
- All classes of IP addresses are optional, can create other classes
- Uses DHCP for VM network configuration
- Users responsible for protecting their machines



## Configuration

- Network configuration usually achieved through switch routing rules.
- Public addresses: standard public IPv4 and/or IPv6 addresses
- Local and private addresses: 10.x.x.x and/or 192.168.x.x addresses
- Need to have 1 address for every (potentially) running VM!

## DHCP

- Need to have all addresses allocated to VMs via DHCP
- DHCP server must be visible from VM, with datagram packets
- Usual (arbitrary) mapping: x.y.z.q to 0a:0a:x:y:z:q

## DNS

- All addresses must have names
- Reverse lookup must work

# Limited Number of Public IPs?



## Port Address Translation

- StratusLab does support PAT
- When used, front end acts as interface to VM nodes
- Conserves real public IP addresses
- Large data transfers can make frontend a bottleneck

# Exercises



1. **Determine the network ranges you'll use for each network type**
2. **Ensure that DNS server is configured (forward and reverse)**
3. **If using external DHCP, ensure it is also properly configured**



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# Questions and Discussion

website <http://stratuslab.eu>

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StratusLab source <http://github.com/StratusLab>

SlipStream source <http://github.com/slipstream>



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