

# YAHOO!

## OPENSTACK CLOUD AT YAHOO SCALE: HOW TO AVOID DISASTER

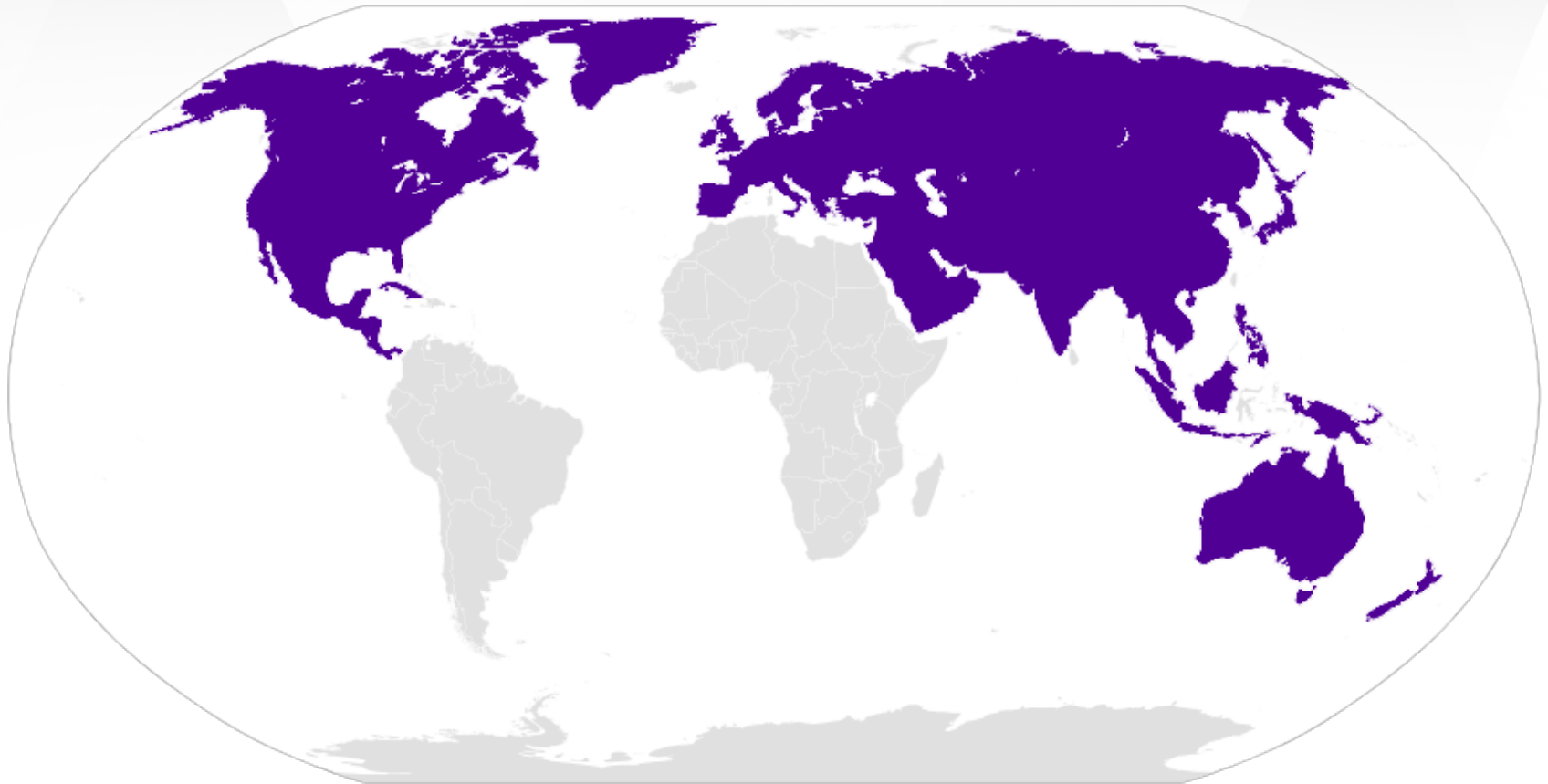
Anders Beitnes

Yahoo Paranoids

# Yahoo Scale

- 800 million + monthly users
- 10x traffic spikes
- News , finance, millions/day
- Mail 110+ million daily users, 170+ petabyte data, 30 billion emails sent daily.
- Mobile photo uploads +50% quarter over quarter
- We're hiring many developers, to experiment, build, and deliver.

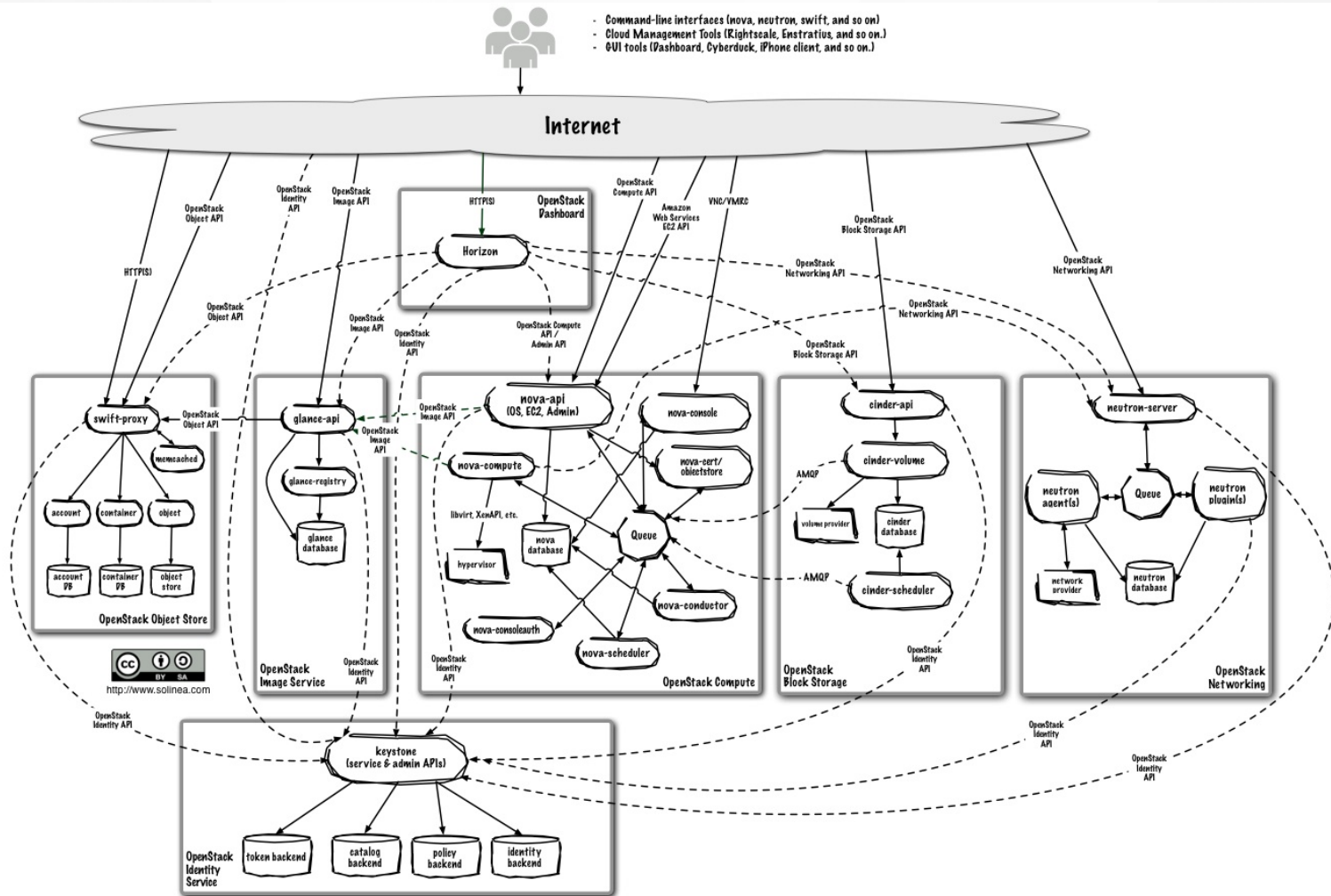
# OpenStack Reach



## Slice and Dice

- Multiple Private Clouds
- The production clusters are in separate security domains.
- We control what enters and leaves the VMs.
- Employee access only.
- We own the VMs and the data they contain, and can inspect it.
- We manage more than VMs

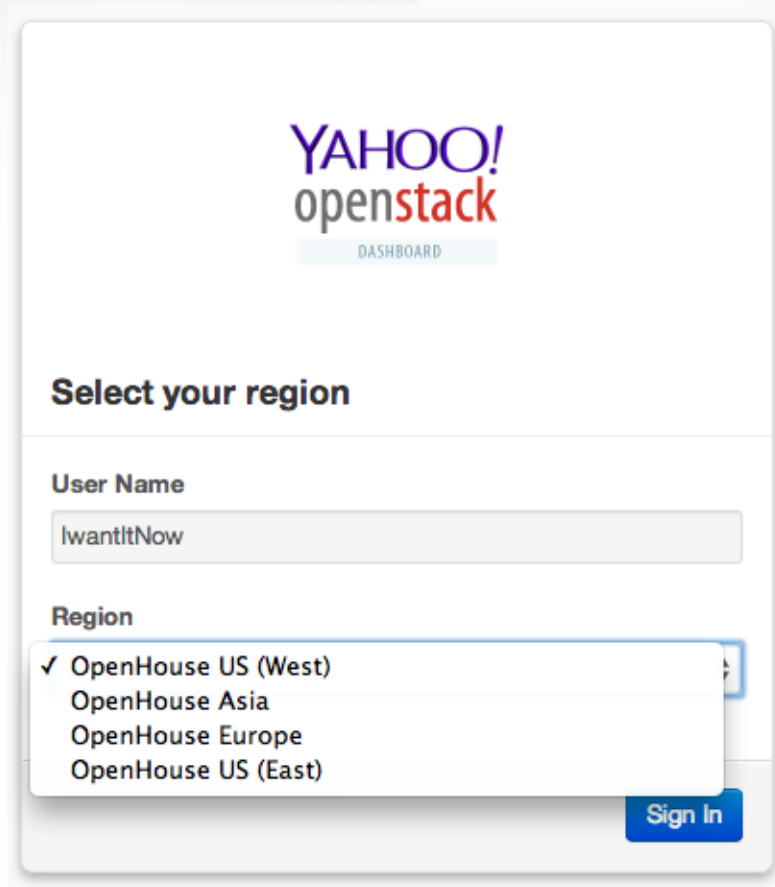
# Don't Panic!



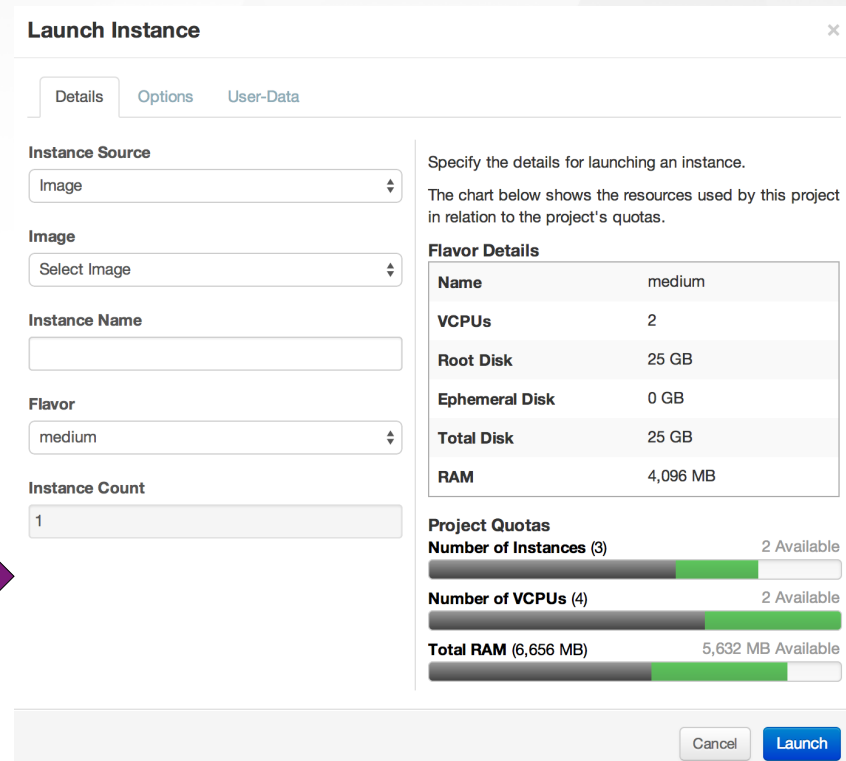
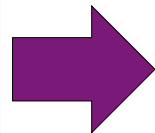
## Loneliness can be a good thing

- Who should the Infrastructure nodes talk to?
- Hypervisors should listen to their parents.
- Who should VMs talk to?

# Who should talk to the Corporate Infrastructure nodes?



The image shows the Yahoo! OpenStack Dashboard. At the top is the 'YAHOO! openstack' logo with a 'DASHBOARD' link. Below the logo is a section titled 'Select your region'. Under this, there is a 'User Name' field with the text 'IwantItNow'. Below the username field is a 'Region' dropdown menu. The dropdown is open, showing four options: 'OpenHouse US (West)' (which is selected with a checkmark), 'OpenHouse Asia', 'OpenHouse Europe', and 'OpenHouse US (East)'. At the bottom right of the dashboard is a blue 'Sign In' button.



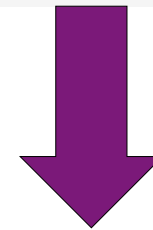
The image shows the 'Launch Instance' window with three tabs: 'Details', 'Options', and 'User-Data'. The 'Details' tab is active. It contains several fields: 'Instance Source' (set to 'Image'), 'Image' (set to 'Select Image'), 'Instance Name' (empty), 'Flavor' (set to 'medium'), and 'Instance Count' (set to '1'). To the right of these fields is a section titled 'Specify the details for launching an instance.' followed by a note: 'The chart below shows the resources used by this project in relation to the project's quotas.' Below this is a 'Flavor Details' table:

| Name           | medium   |
|----------------|----------|
| VCPUs          | 2        |
| Root Disk      | 25 GB    |
| Ephemeral Disk | 0 GB     |
| Total Disk     | 25 GB    |
| RAM            | 4,096 MB |

Below the table is a 'Project Quotas' section with three progress bars:

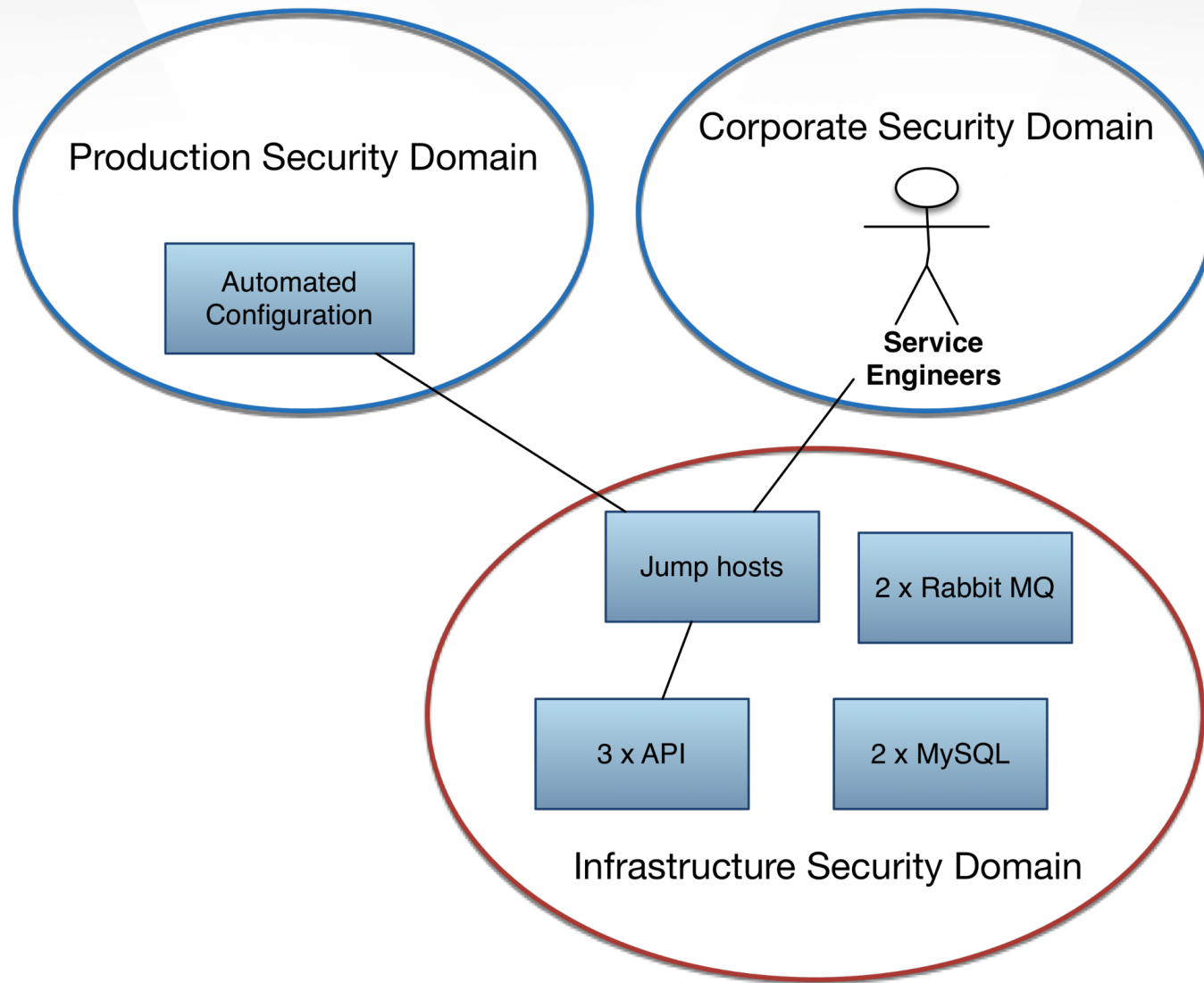
- Number of Instances (3)**: 2 Available (progress bar shows 2/3)
- Number of VCPUs (4)**: 2 Available (progress bar shows 2/4)
- Total RAM (6,656 MB)**: 5,632 MB Available (progress bar shows 5,632/6,656)

At the bottom right of the window are 'Cancel' and 'Launch' buttons.

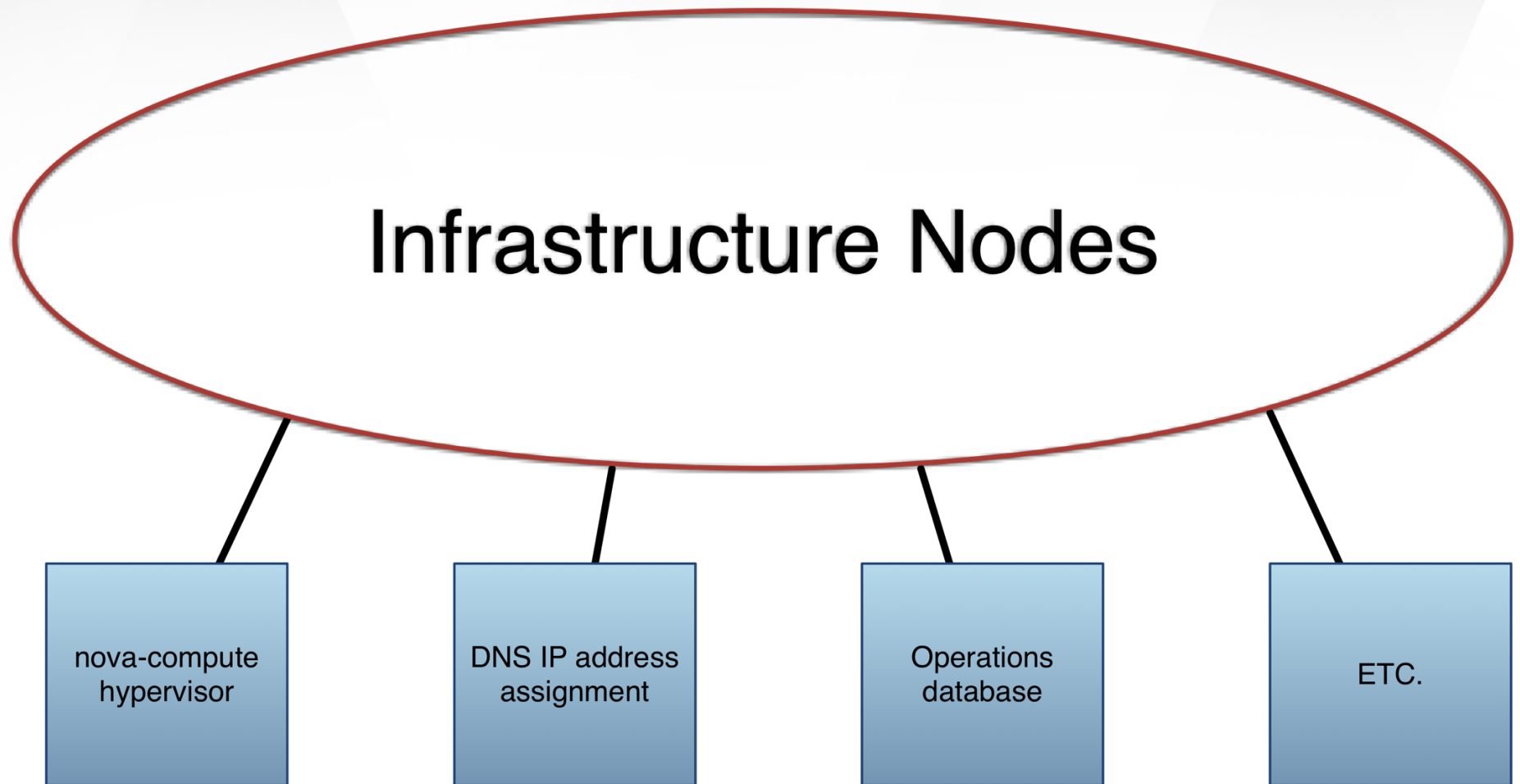


while true; do ssh ihatetowait.corp.ne1.yahoo.com; sleep 5; done

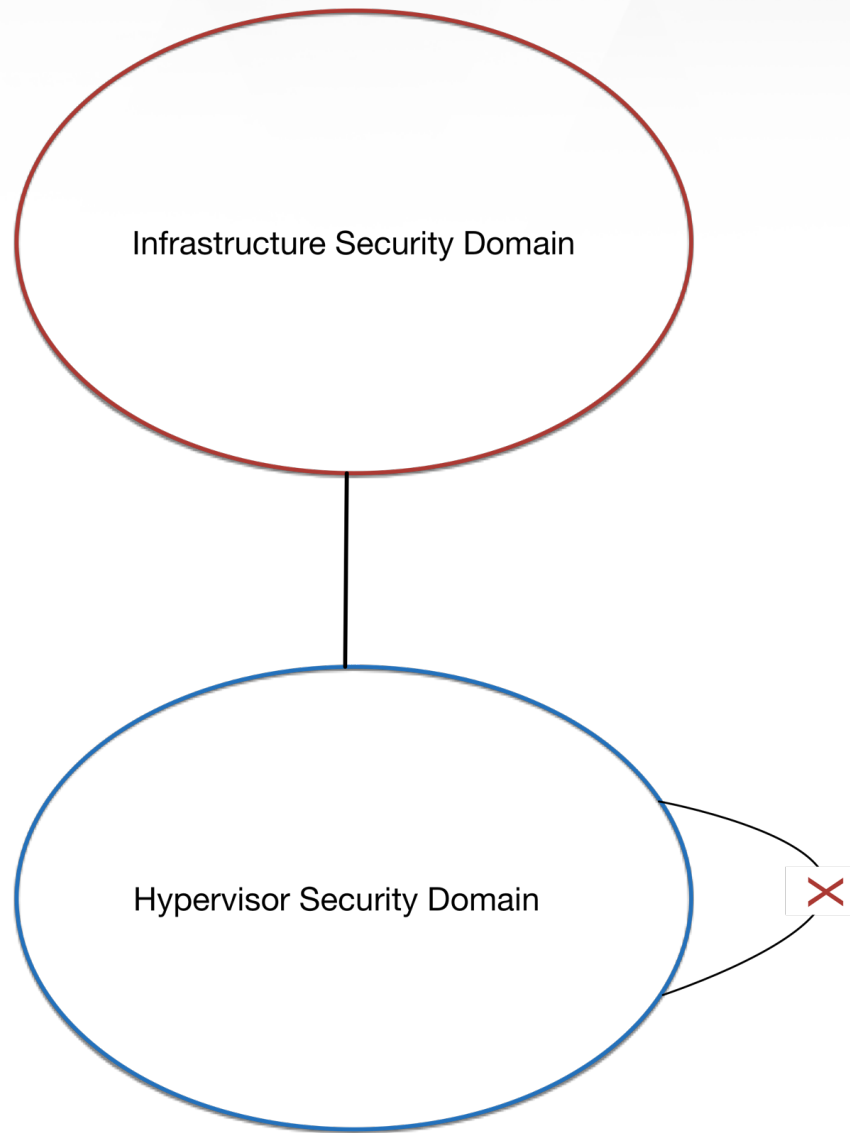
# Who should talk to the Production Infrastructure nodes?



Who should the Infrastructure nodes talk to?



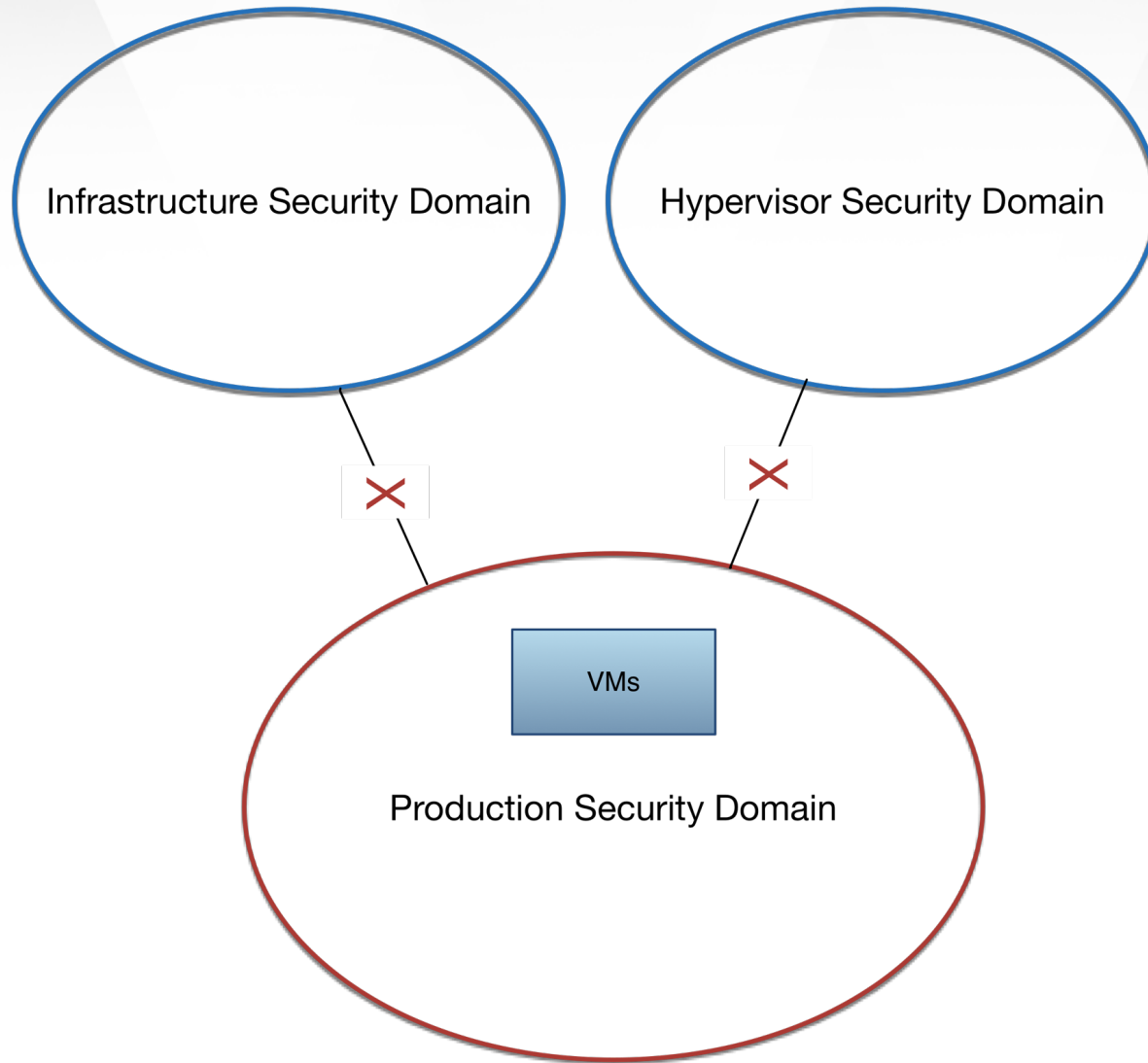
# Who should the Hypervisors talk to?



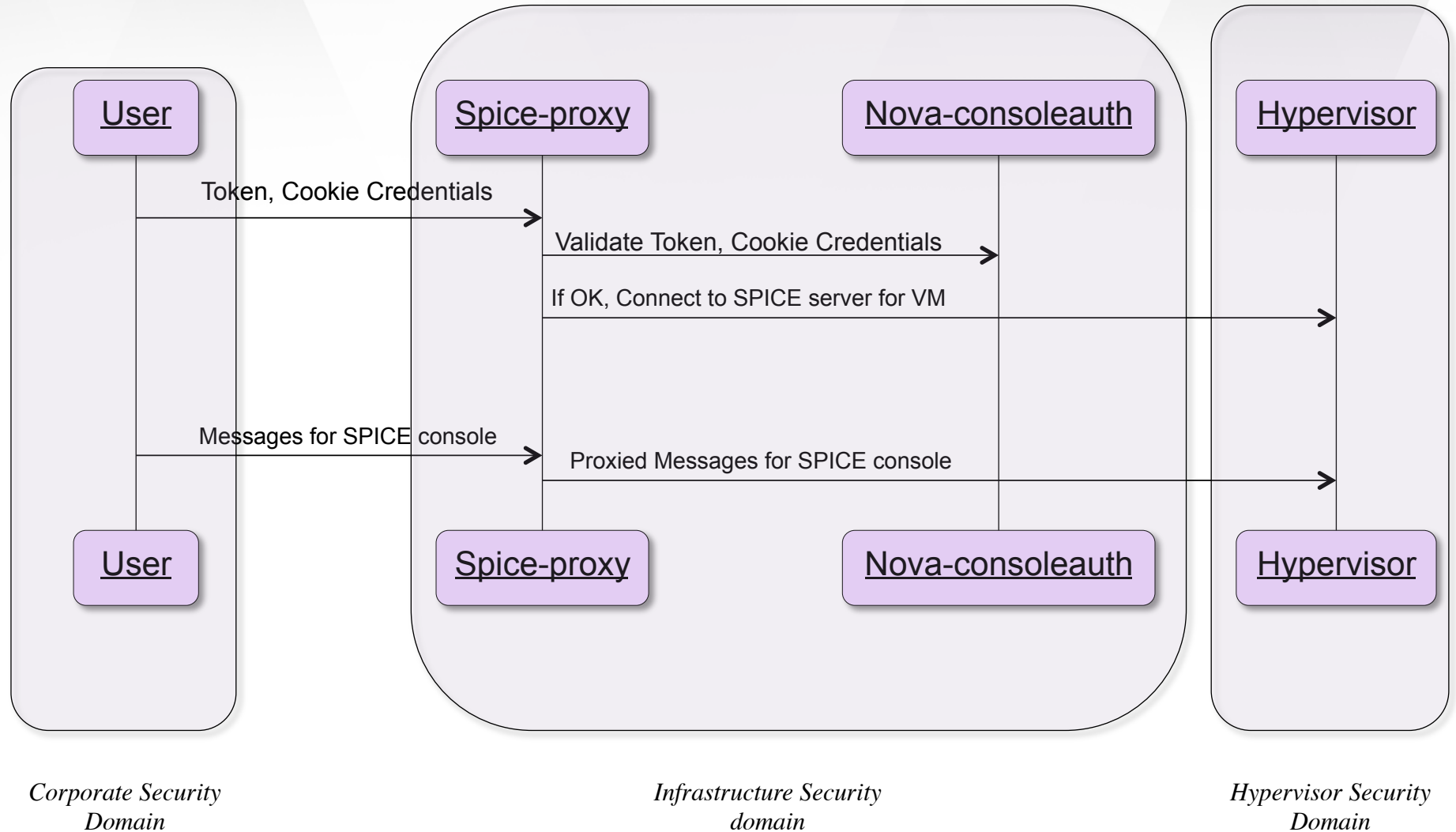
## No VM Migration?



# Who should the VMs talk to?



# Who should talk to the VMs?



One Infrastructure node cluster to rule them all



What about those responsible for the Infrastructure nodes?



# Keystone



# Keystone policy file

```
{  
  "admin_required": [["role:admin"], ["is_admin:1"]],  
  "gsd_admin": [["rule:admin_required"], ["role:GSDAdmin"]],  
  "default": [["rule:admin_required"]],  
  
  "get_role": [["rule:gsd_admin"]],  
  "get_roles": [["rule:gsd_admin"]],  
  "get_role_refs": [["rule:gsd_admin"]],  
  "get_all_projects": [["rule:gsd_admin"]],  
  "get_project": [["rule:gsd_admin"]],  
  "get_project_users": [["rule:gsd_admin"]],  
  "get_user": [["rule:gsd_admin"]],  
  "get_users": [["rule:gsd_admin"]],  
  "get_user_roles": [["rule:gsd_admin"]]  
}
```

# Impostors and Spies



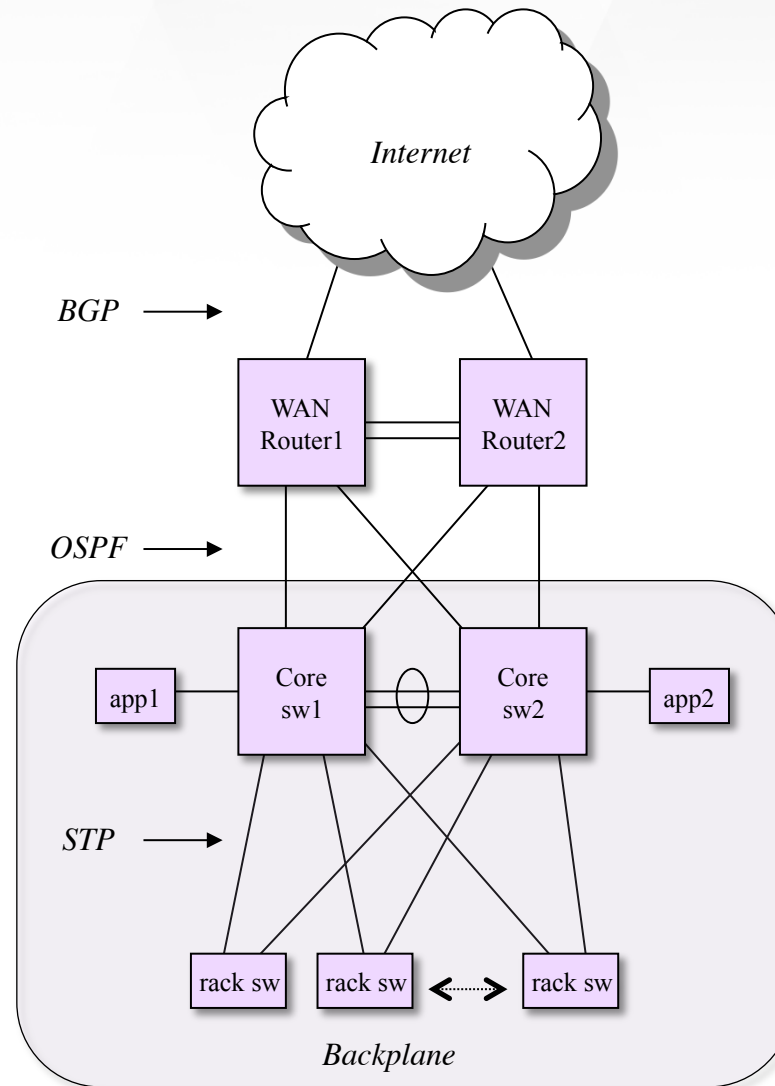
Someone to watch over me



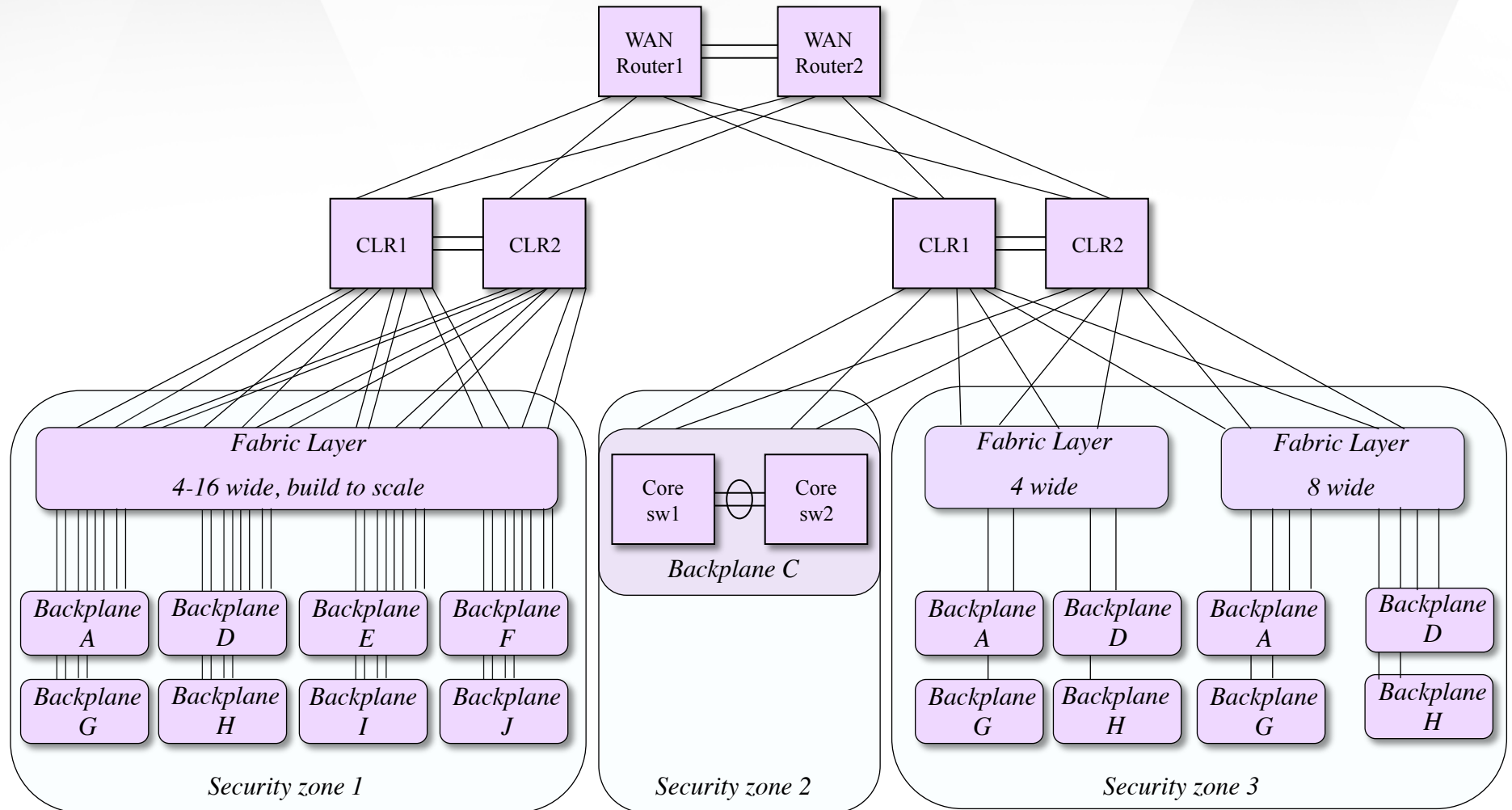
# Next generation networks

- What are the issues with Networking at scale?
- L2 networks provide VLAN isolation, but have an associated cost problem
- L3 networks solve the cost issue, but pose a security issue.

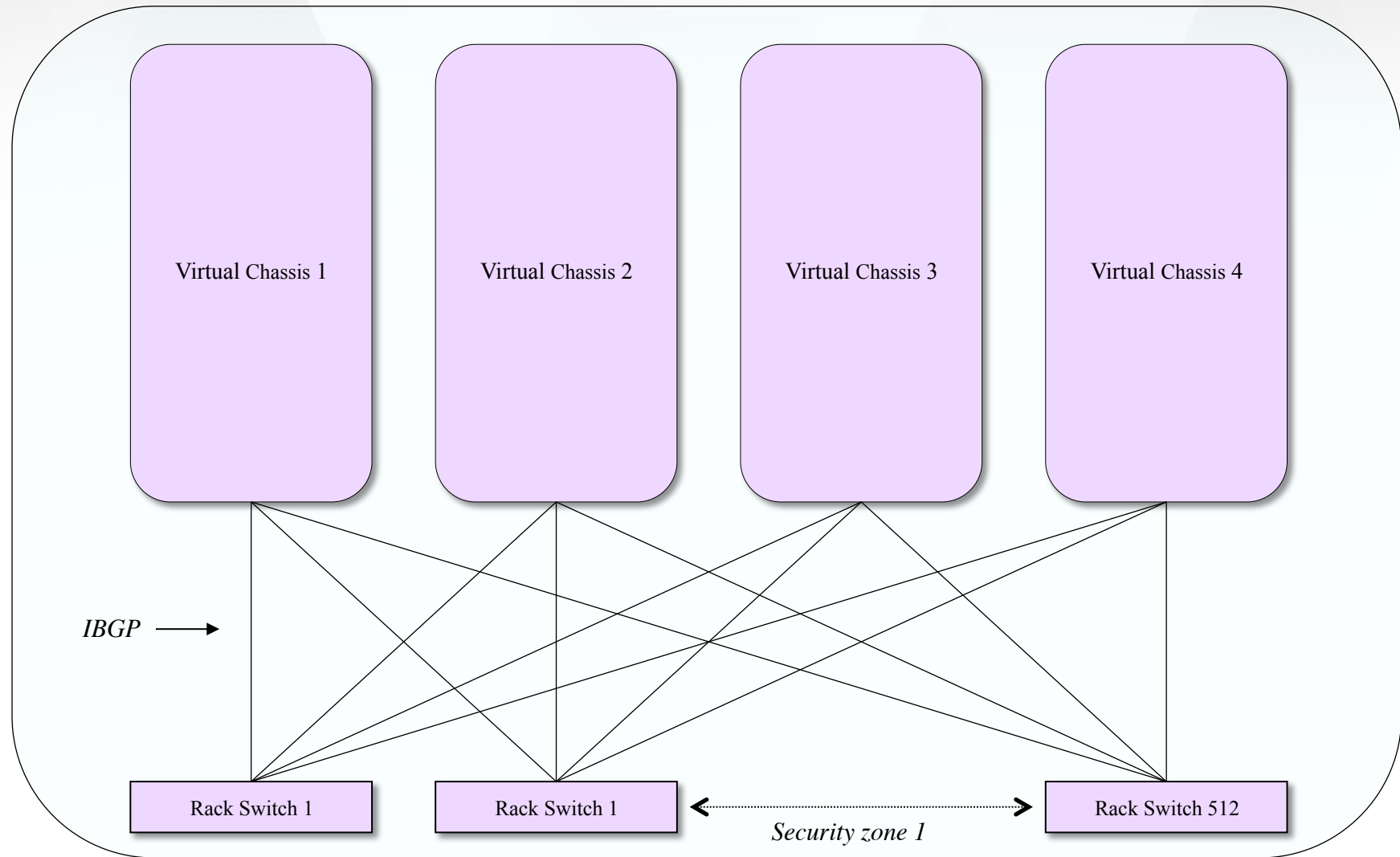
# L2 Network



## L2 network + Yahoo Scale



# Next generation networks at Yahoo Scale





# Thanks!

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