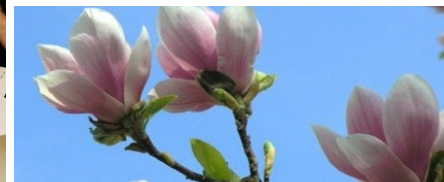




LUND  
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# Data center networks lab

## “Cloud networks”



# Background

- Cloud based services
  - run on off the shelf servers in data centres
  - Organisations swap CAPEX for OPEX
  - easy to scale resources up and down based on need
  - “Everything is being cloudified”
    - 5G core network functions (NFV)
    - Data storage
    - Processing, computation
    - web services
  - the data center is a placeholder for the virtual universe
    - it has it’s own way of dealing with networking



# The two aspects in this lab

- Testing before deployment in live environment
  - Since many services share the same hardware platform in virtual instances, deploying new services and protocols is dangerous
  - emulate datacenter networks and test engineering solutions first (mininet)
- Hands on experience with configuration of virtual networks using the inbuilt native Linux support
  - know how it works in practice, not just theory



# The Lab, Sibirien (E:2429)

- In Sibirien there are 12 PCs dedicated to this lab, one per desk. They are preinstalled with the correct environment to run the lab. Two PCs share monitor on each desk.
- The lab is open for students registered on the course
- Computers are FCFS
- If a computer doesn't work, email tutor with machine name for reinstallation
- Login as: student, password: cloudnetworking (root password also: cloudnetworking)



# Basic setup, Linux

- Since all students login with the same credentials, you cannot store anything on the lab PCs. **ALWAYS** save files on the USB disk.
- You will be working with a clean Linux distro, Ubuntu.
- On the left hand side, open up a Terminal and start following the lab instructions
- The lab will run self contained on a single PC where the network components will be virtualised using the native Linux virtualisation support.

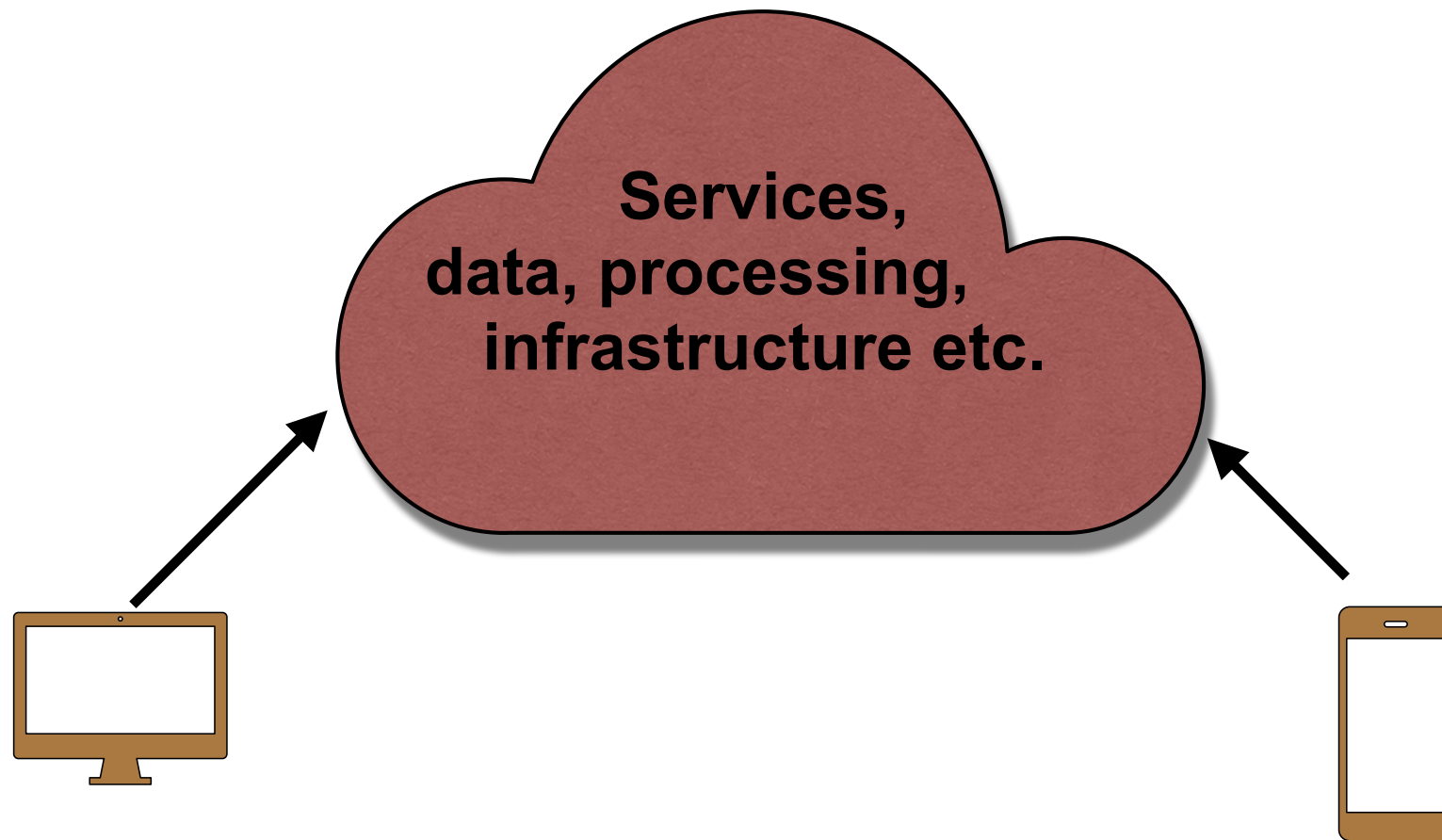


# Report

- The lab has two components, the first is a walk through manual with some questions to be answered, shell commands given to be used and tested etc.
- Each group of maximum two students should hand in a report with all questions from parts one and two clearly and concisely answered. Unclear hand drawn figures and text will not be marked.



# The cloud, logically





# The cloud, in reality



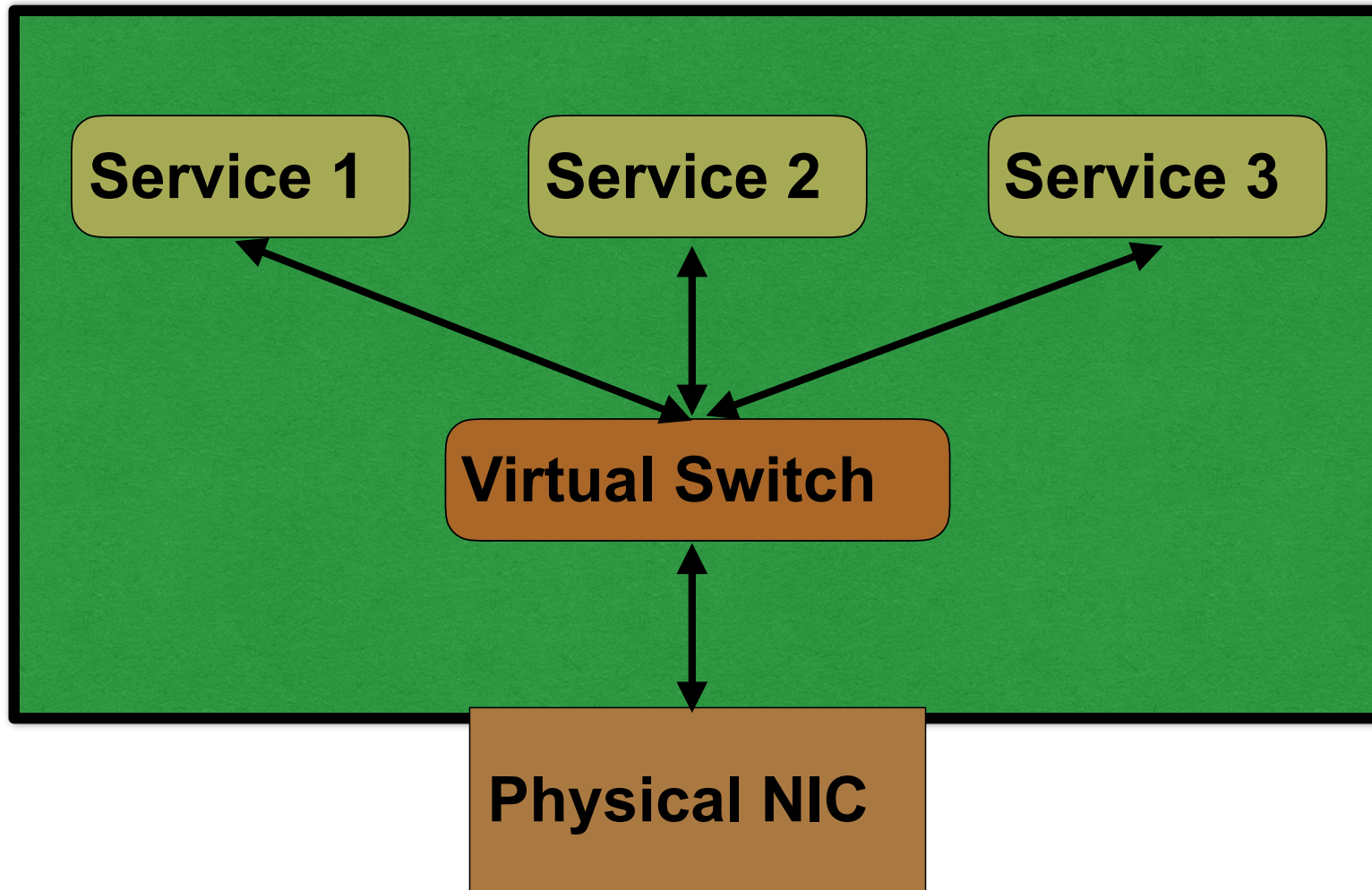


# Off the shelf servers, general computational platforms

- A single physical machine contains multiple virtual instances of services
- A service can be replicated on more machines as needed
- How do you make it look like a single service from the outside?
- The service part - Open Stack
- The network part - Open Flow
- Reference implementations currently, much open source
  - The place to start to learn Cloud computing



# A single server



# SDN

- At a larger scale, Software Defined Networking SDN.
- Key idea, separate management and data planes
- Forwarding switch and separate server function
- Allow forwarding policies to be updated at runtime using standard protocols and description formats (software defined)
- Allows much greater flexibility than the standard router paradigm when needed.



# Lastly

- Check access to the lab
- If you are registered on the course at course start, you should have access
- If you have never seen Linux before, start playing with it now to save time later.....

