ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
CAMPUS DI CESENA

Homework – Load Balancer

Chiara Grasselli, Franco Callegati

LAB. OF NETWORK PROGRAMMABILITY AND AUTOMATION - PROGRAMMABLE NETWORKING (A.Y. 2024/2025)

Server load balancing concept

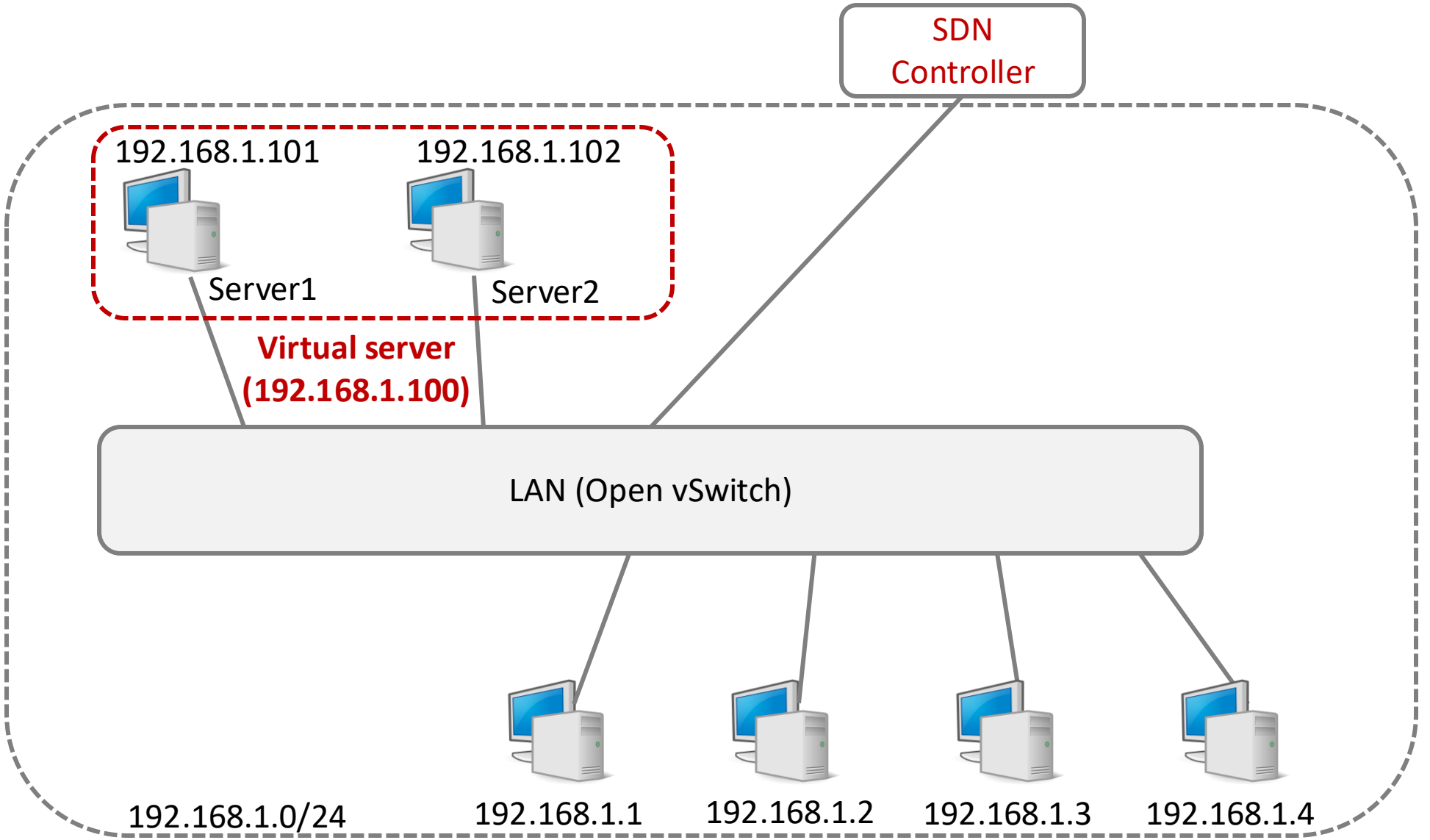
- Goal
  - Distribute high traffic among several servers using a network-based hardware or software-defined appliance
- Implementation
  - Virtual server
    - An IP address is reserved for the logical service end-point
    - The IP address is given to the load balancer that behaves as a gateway towards the physical servers
  - Physical servers
    - Servers running the same service
    - Traffic is routed by the load balancer to one of the physical servers

Goal of the homework

- Write and a test a controller program implementing a load balancer

- One virtual server is implemented with 2 physical servers
- The server will support TCP connections on transport port 8080
- Topology and IP addresses are shown in the following slide

Topology



Guidelines

- In terms of the load balancing algorithm, implement a simple round robin
  - Servers are indexed from 1 to N
  - The requests are distributed to servers in rotation from 1 to N
  - Each server should serve on average the same amount of requests
- Emulate the application service using the netcat utility

- Outline a Ryu controller program to implement the load balancer