

# The ViSION Project

Minor Review Meeting  
18 December 2012

CERN openlab - HP Networking  
Dan Savu and Stefan Stancu



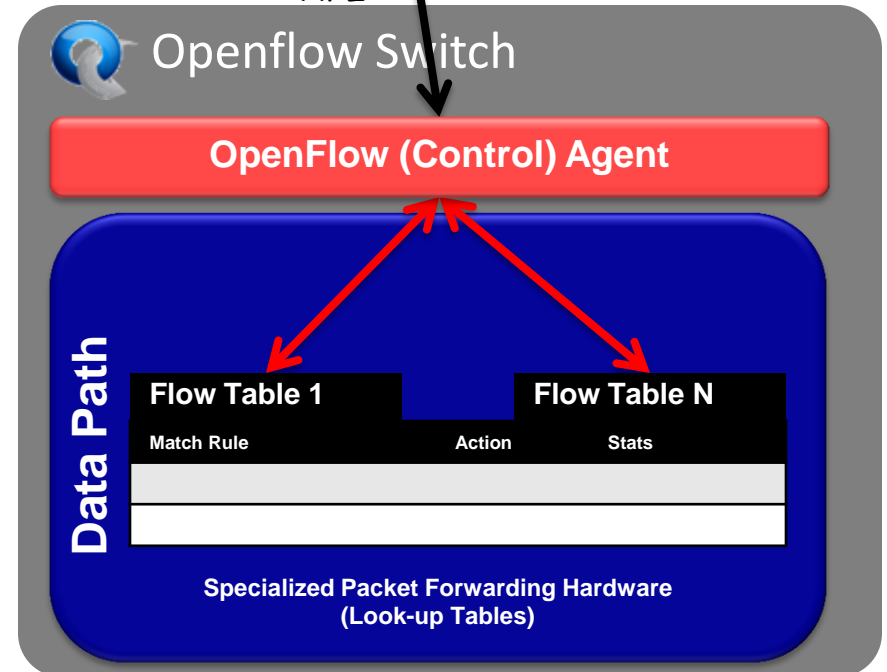
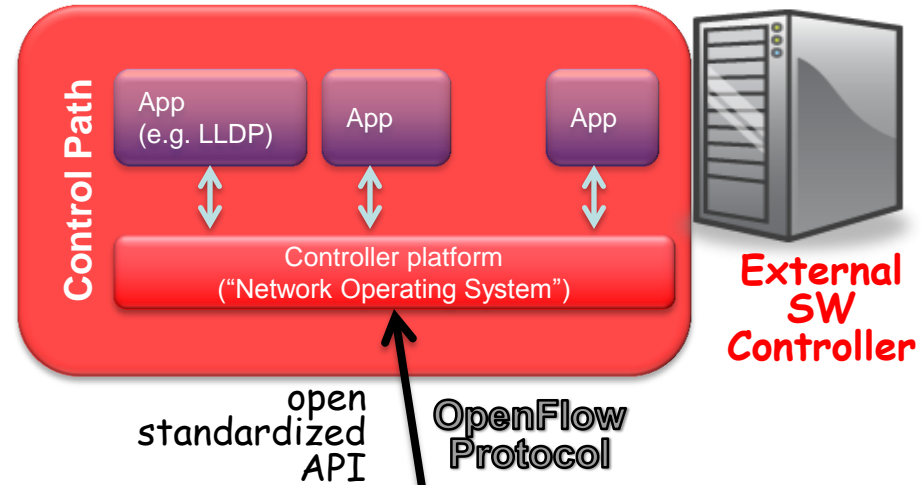
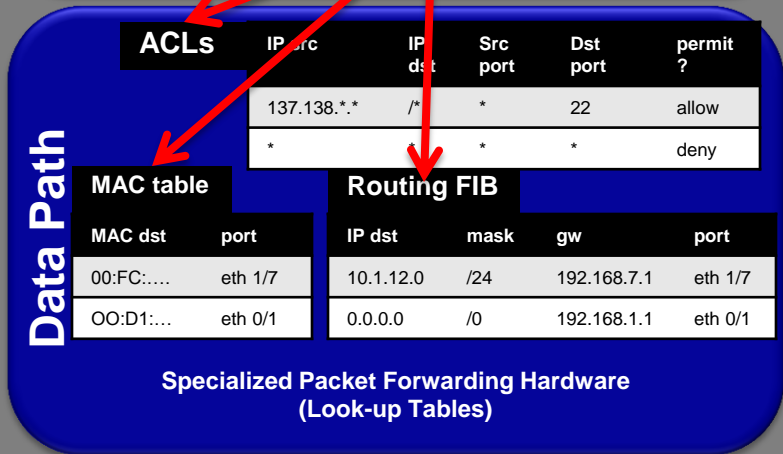
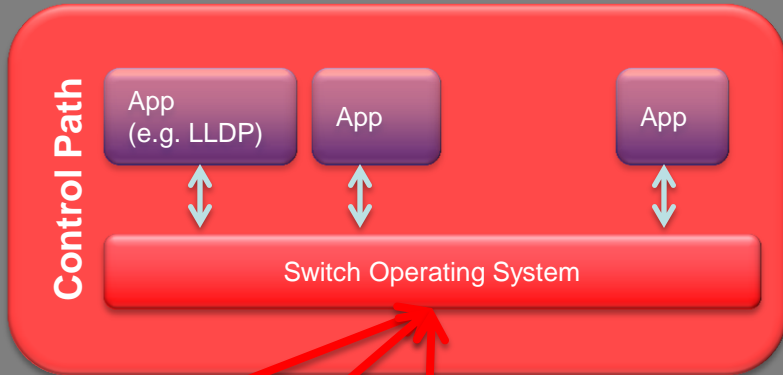
- CERN openlab - HP Networking collaboration
  - Traffic orchestration
  - Software Define Networking approach
    - **Based on OpenFlow**
  - Started in February 2012
  - 2 engineers, 3 years

“We recognized the need to scale our perimeter firewall capacity to cope with the increase of internet traffic,” – Jean-Michel Jouanigot, communication systems group leader, IT Department, CERN.

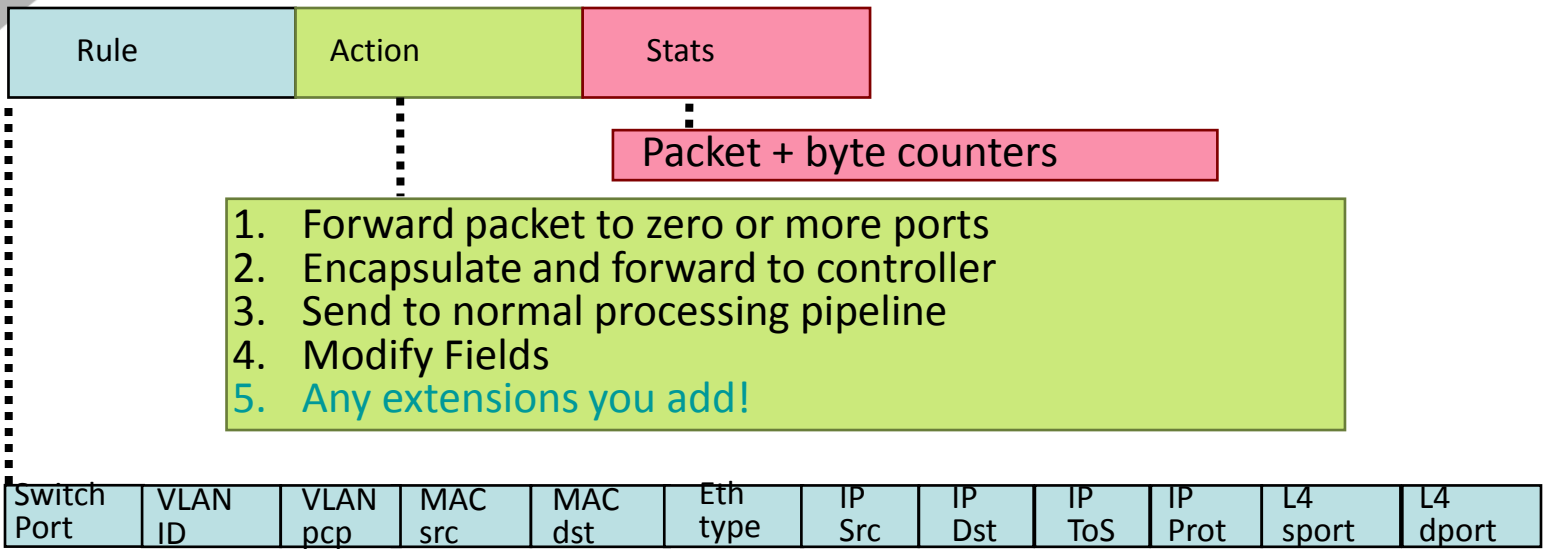
- **OpenFlow**
  - What it is
  - How it works
- **Networking: traditional vs. SDN**
  - Applying OpenFlow
- **ViSION**
  - SDN development platform
  - Use case
  - Testing procedures
  - Status and outlook

# OpenFlow – reclaim your control!

## Traditional Switch



# OpenFlow – Flow Table Entries



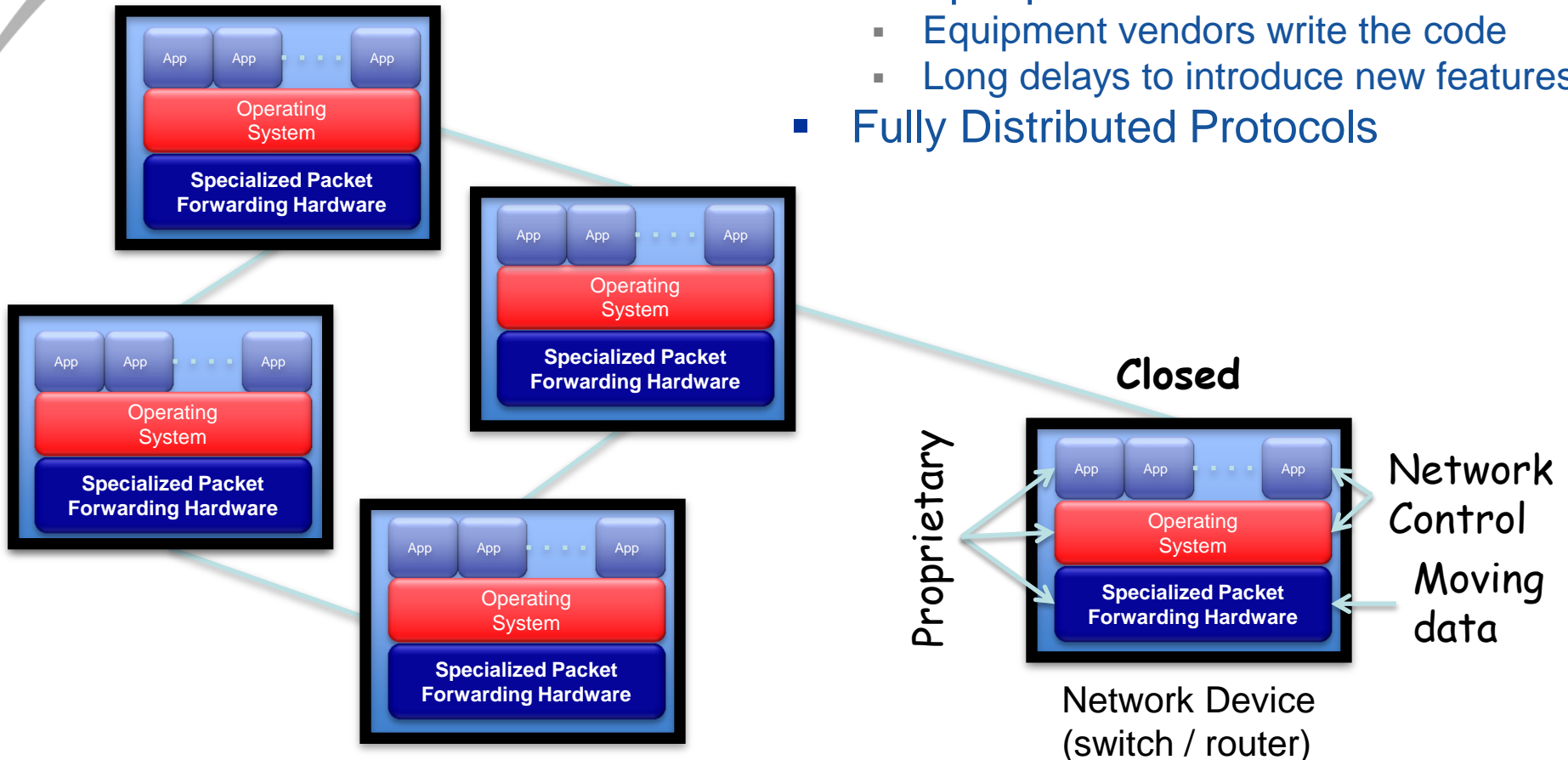
+ mask what fields to match  
 + wildcard bits in selected fields (e.g. IP addresses)

## Examples

Switching	Switch Port	MAC src	MAC dst	Eth type	VLAN ID	IP Src	IP Dst	IP Prot	TCP sport	TCP dport	Action
	*	*	00:1f:...	*	*	*	*	*	*	*	port6
Routing	Switch Port	MAC src	MAC dst	Eth type	VLAN ID	IP Src	IP Dst	IP Prot	TCP sport	TCP dport	Action
	*	*	*	*	*	*	5.6.7.8	*	*	*	port6

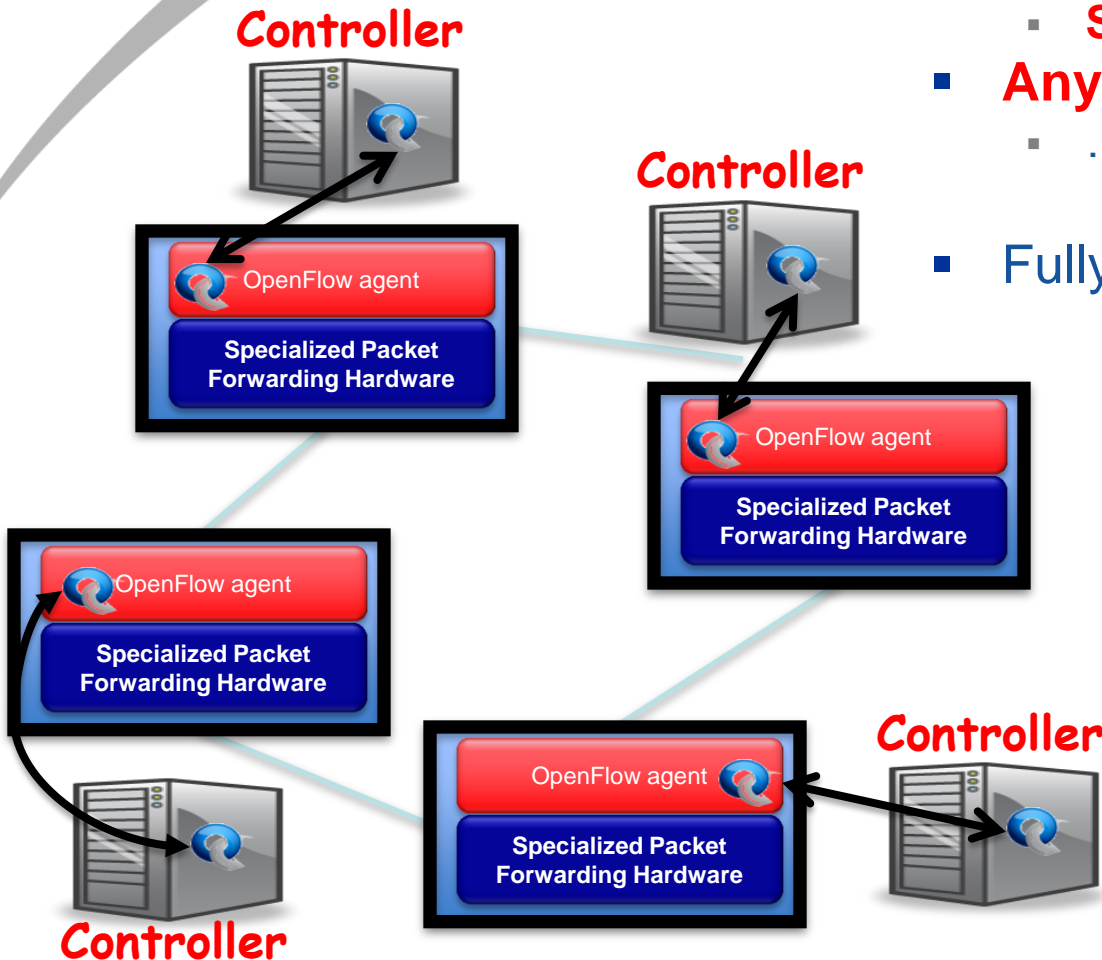
# Traditional Networking

- Closed equipment
  - Software bundled with hardware
  - Vendor-specific interfaces
- Few people can innovate
  - Equipment vendors write the code
  - Long delays to introduce new features
- Fully Distributed Protocols

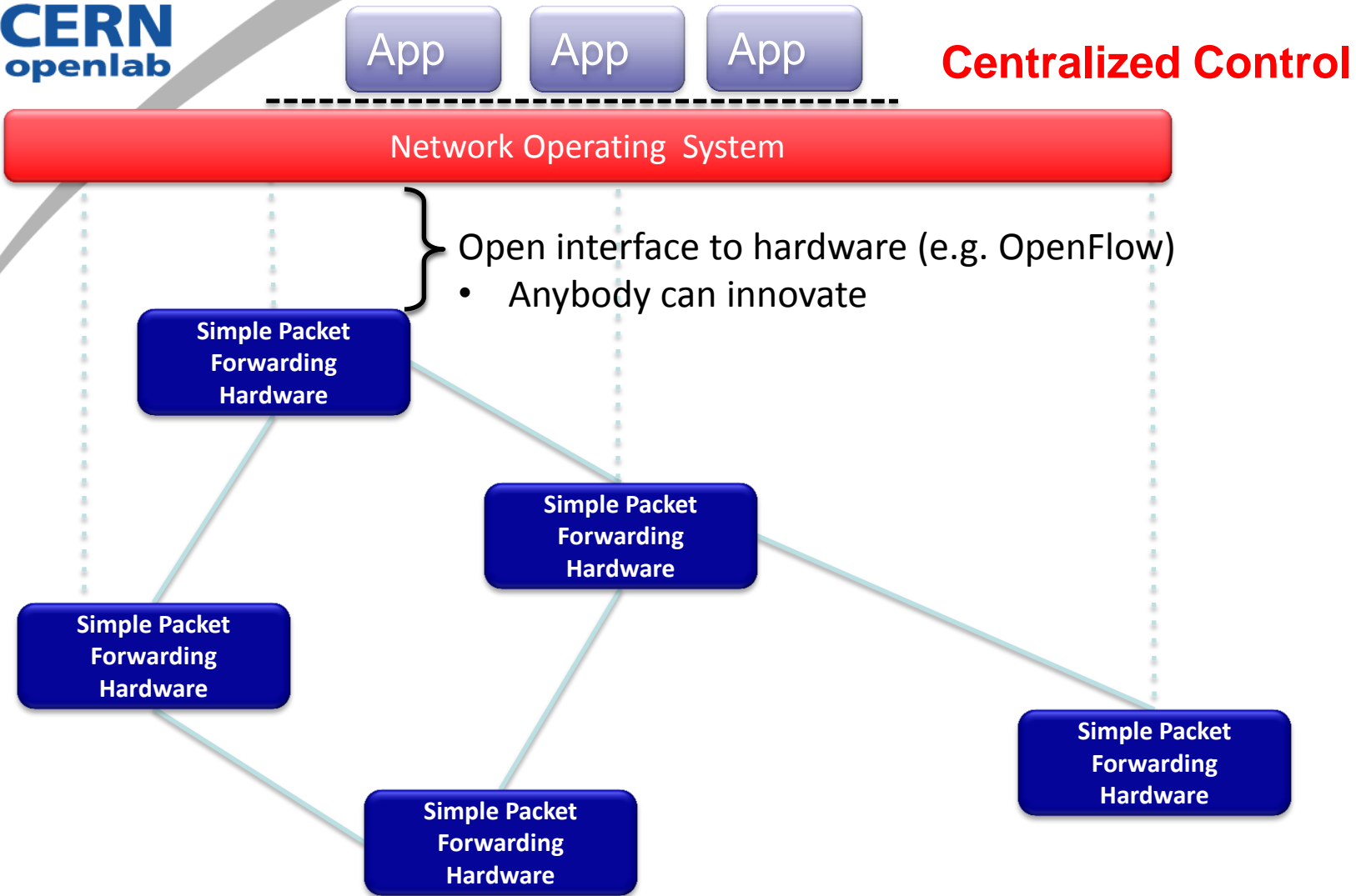


# Traditional Networking ++

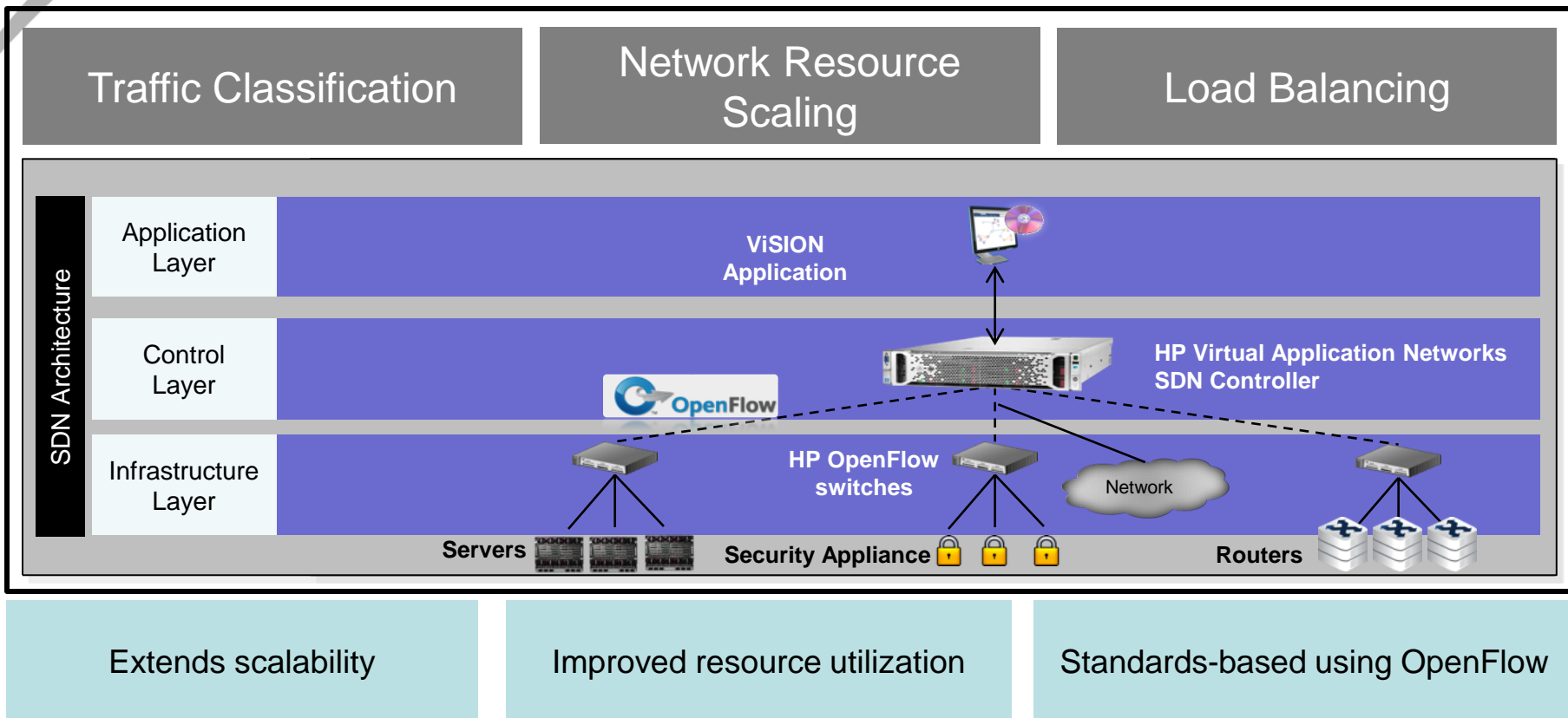
- **Open** equipment
  - Software **decoupled** from hardware
  - **Standard** interface (OpenFlow)
- **Anybody** can innovate
  - ... or at least try to innovate
- Fully Distributed Protocols



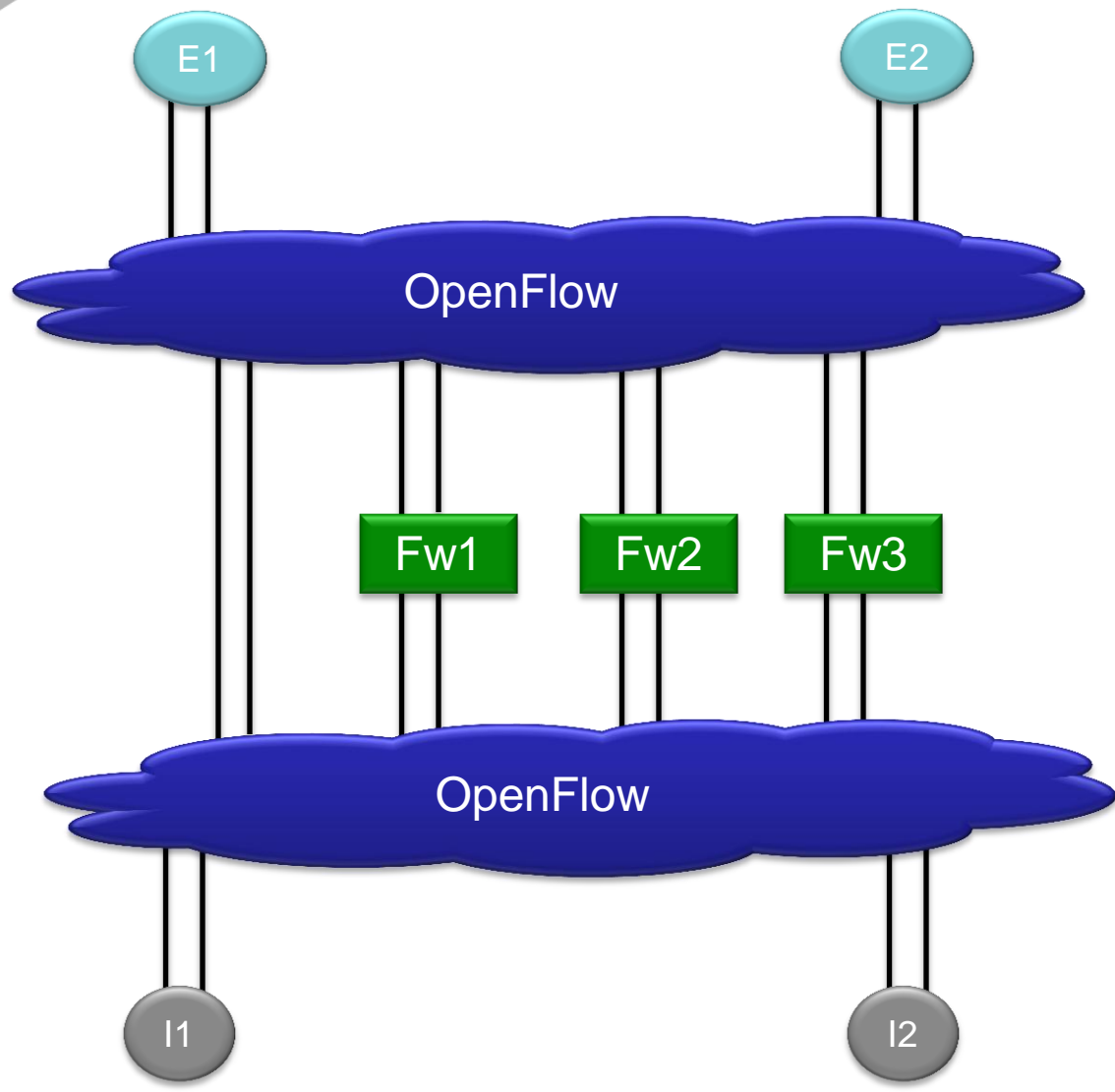
# Software Defined Networking (SDN)





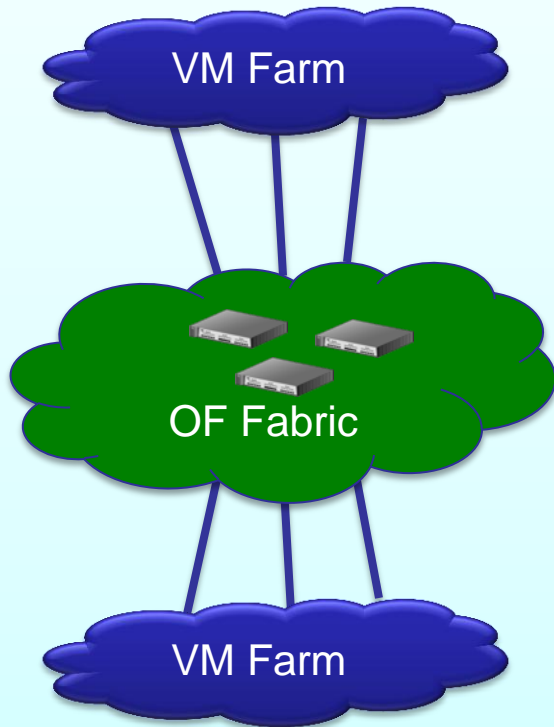


# ViSION for scaling CERN's firewall



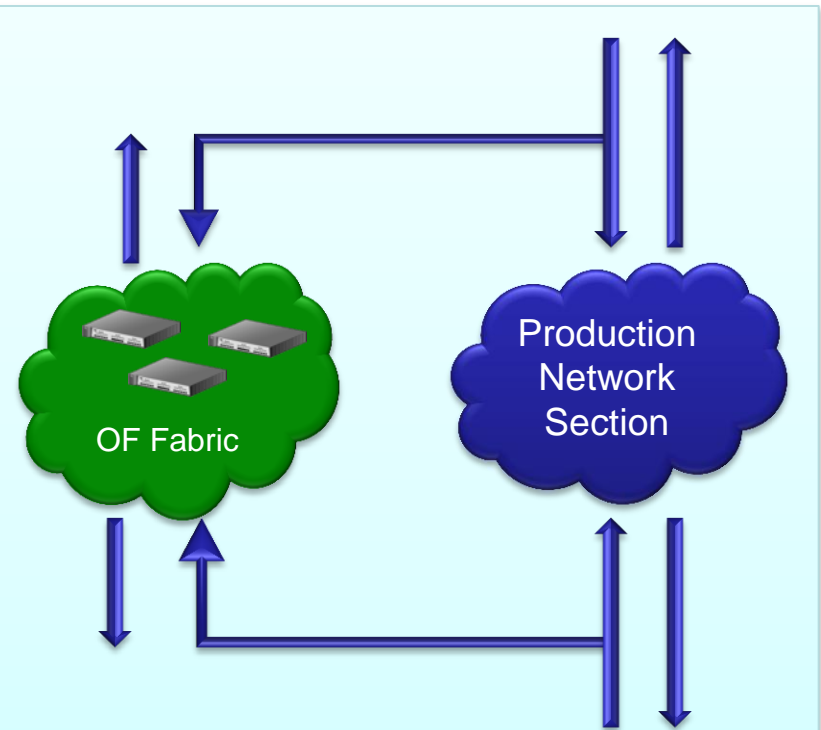
## ■ Regression testing

- Deterministic traffic injection
- End to end quality metrics



## ■ Mirrored testing

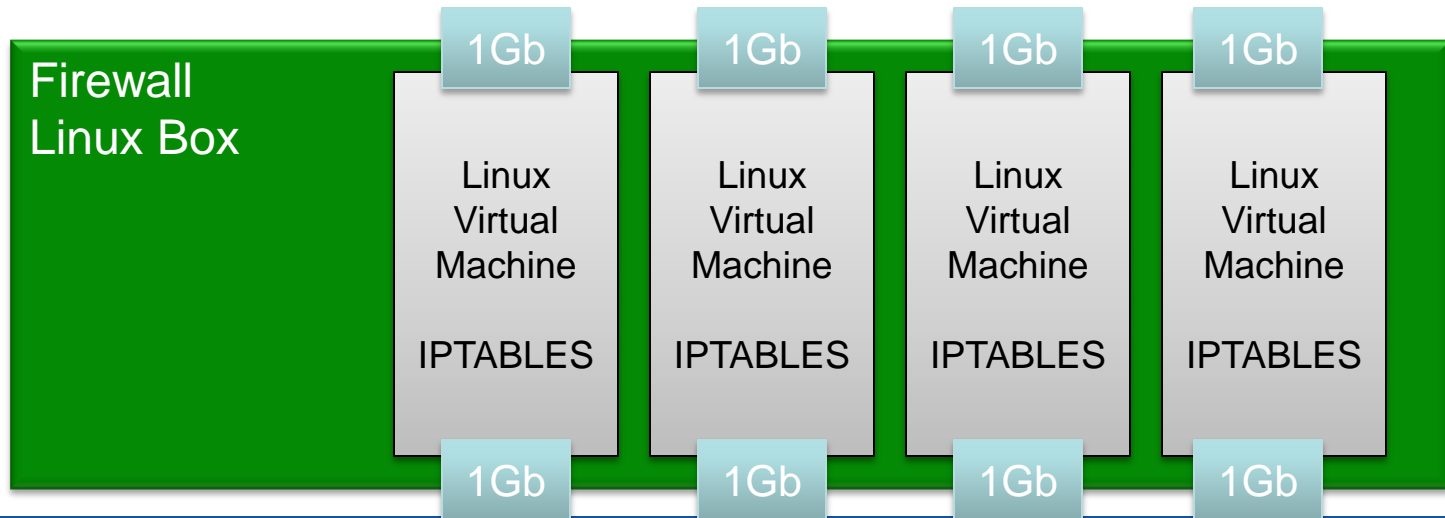
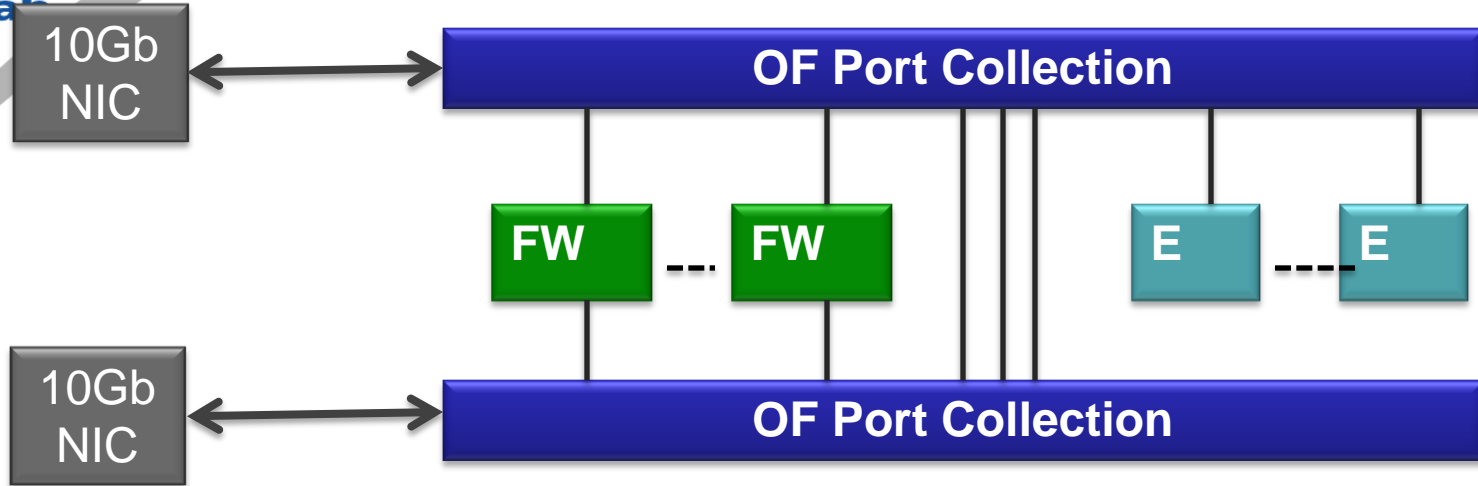
- Test OF setup with real traffic
- Flow pattern analysis





CERN  
openlab

# ViSION Test-bed block diagram



- Familiarized with SDN and HP kickoff visit
- Identify areas where ViSION can bring value through SDN
- Architectural design approved by HP
- Static flow pusher prototype

Feb 2012

Sep 2012

Feb 2013

- Integration with HPN controller and UI framework
- Developing core libraries
- Proof of concept demo