



# Switching on Mikrotik Devices

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# Thank you...

Davide and Francesca  
Il Vito, Elisa, Monet and Federica  
and all my friends

# Massimo Nuvoli (maxnuv)

- Owner of Progetto Archivio SRL
- System Engineer
- Deep knowledge in network and system design with performance goal
- Hardware specialist
- Reworking and renew specialist
- Please, call me Max!

# Objectives

- Know about switching in Mikrotik devices
- Know where is, and what to do with
- How to use CRS125 switch to build a vmware 2 nodes cluster
- Bounty

# Some question

- How much VLAN it is possible to make on a single L2 connection (standard)?
- 4094
- 16760836

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the right answer is the second that is  
4094\*4094 SVID and CVID for QinQ

# Some question

- Bridge speed and switch speed are the same
- YES
- NO

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- Bridge speed and switch speed are the same
- YES
- NO

the right answer is NO, the bridge is inside the core of the Routerboard, so software device, the switch do all the job in hardware



# Why you need serial port?

- Working with switching is sometime dangerous
- If the device has a serial port better
- If the device has a usb port then connect supported ethernet adapter
- If the device has wireless interface then configure for access
- Losing the device mean loss of configuration

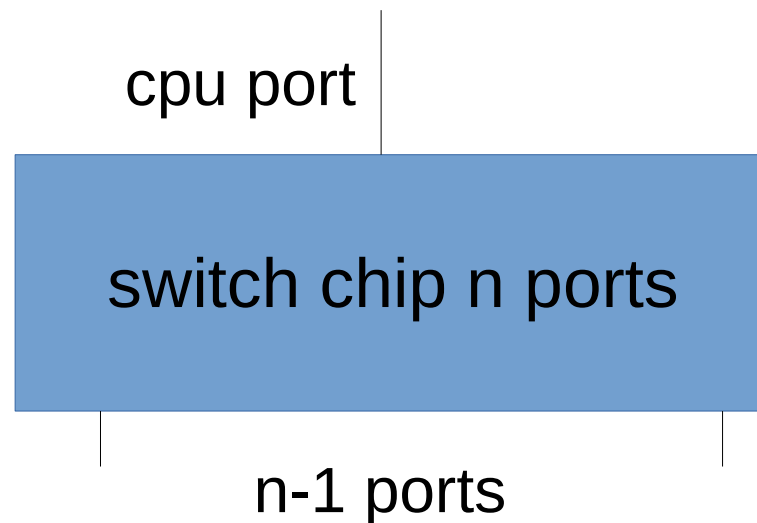
# Some Switching Theory

- Switch is a “simple” device that connects at least two network physical link (L1) doing its job at L2
- And, with VLAN and QinQ CHECK MTU size, each VLAN header is 4 bytes!
- Missing on all (hardware) switch from Mikrotik
  - Spanning Tree
  - Dynamic trunking

Hey! We need them!

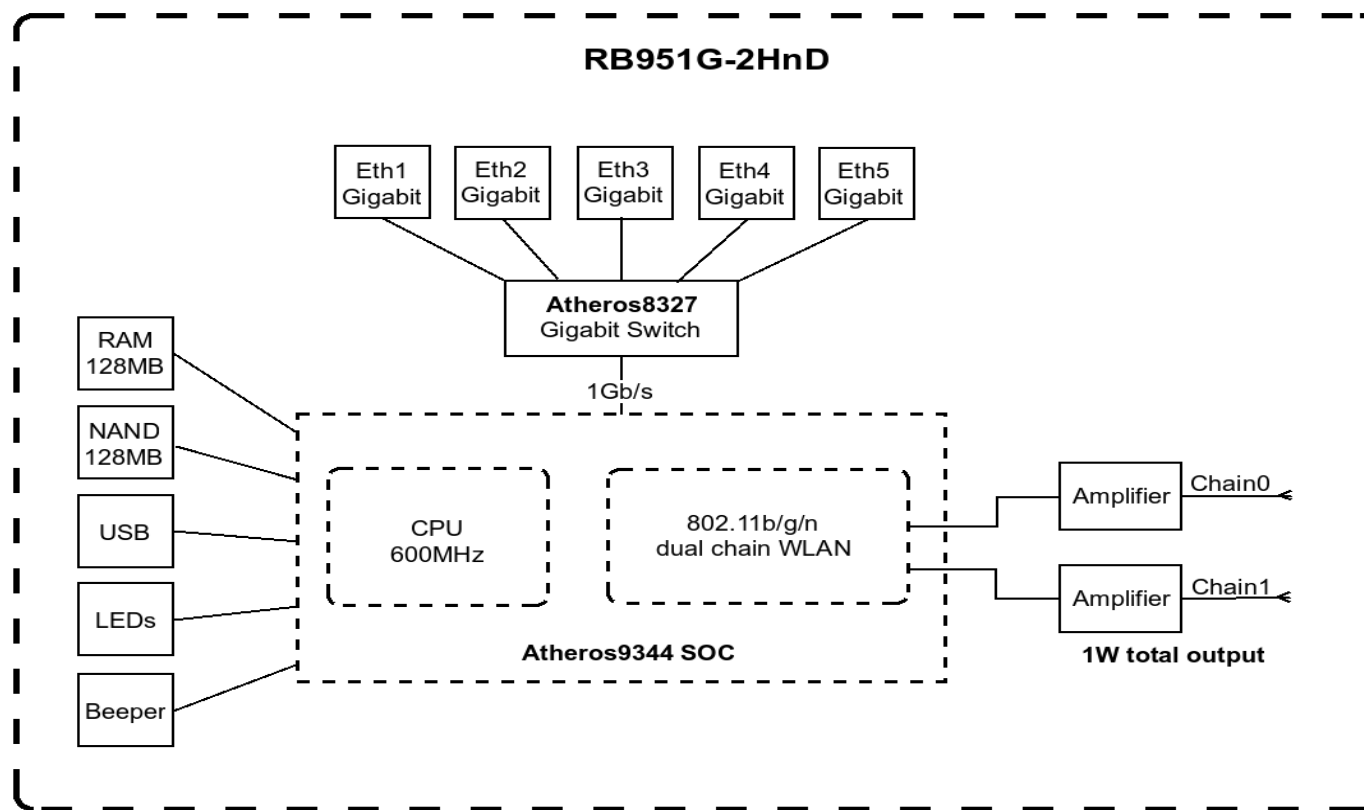
# Mikrotik Switch Concept

- Switch is a fully independent device that communicate with only one (ethernet) port with the router



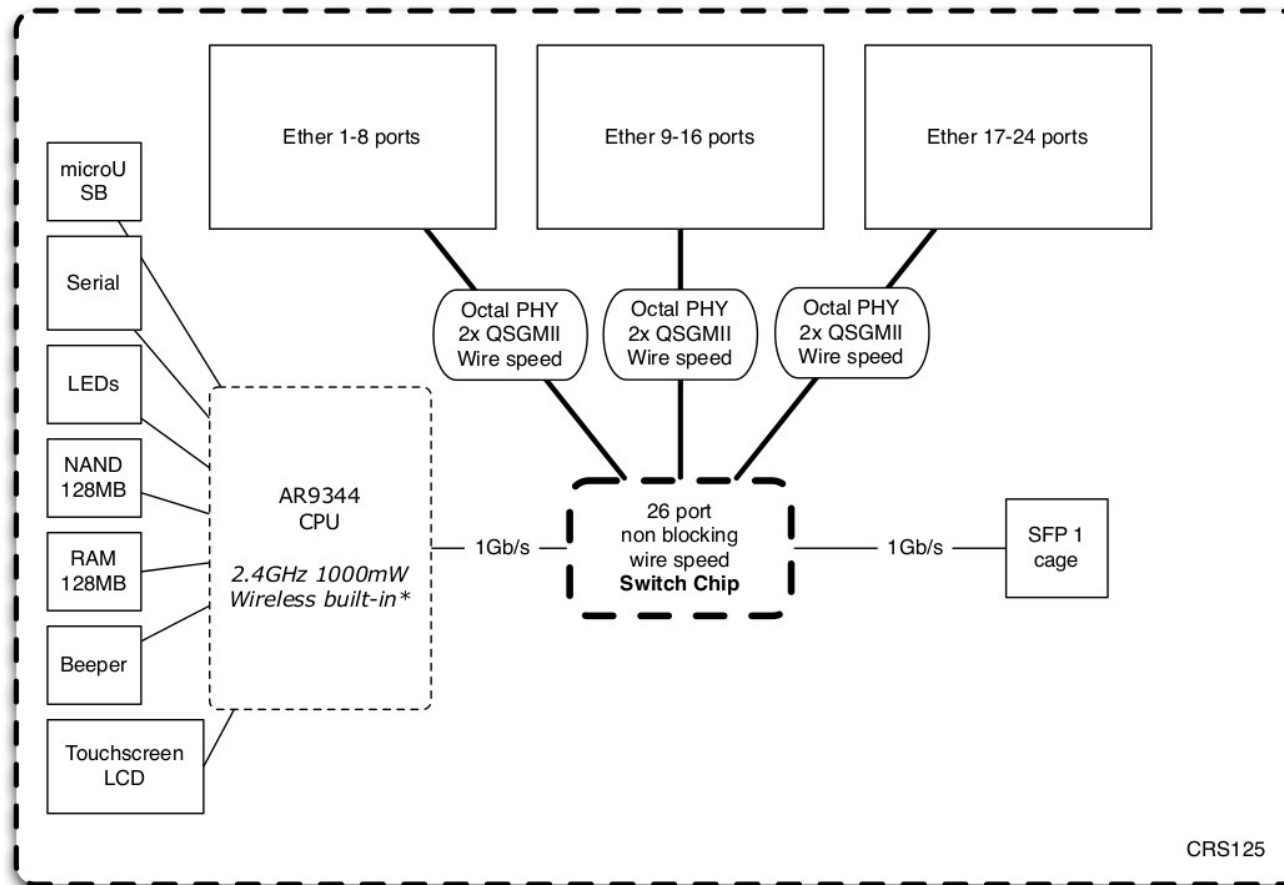
# Mikrotik Switch Mixed Device

- Block diagram of a RB951G-2HnD device



# Mikrotik Switch CRS125

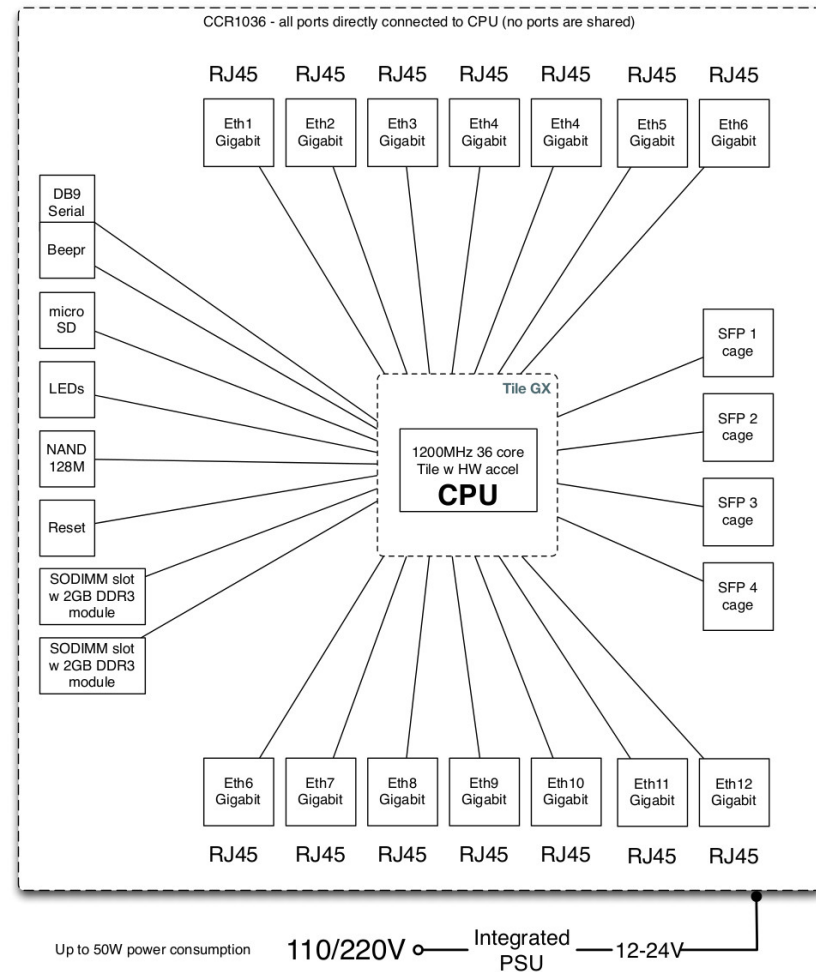
- Block diagram of CRS125 device



\* - Only on CRS125-24G-1S-2HnD-IN

# Mikrotik CCR

- Block diagram of CCR 1036



# Mikrotik Switch Concept

- Ports can be “switched” or grouped only if belonging to the same hardware switch
- A switch is defined by choosing a “master” interface and a number of “slave” interfaces
- The “master” interface is the only that can be used as “interface” with the core router
- A “slave” interface can be managed but it's impossible to see the traffic flowing through

# Mikrotik Switch Concept

Small devices can define only one switch per chip

Bigger devices can have more than one master-slave group

Using more than one master-slave setup and vlan is “not good”

It is better a VLAN only setup.



# Mikrotik devices differences

- Small and simpler devices can have no switch
- More mixed devices have a switch chip, basic functions, only one master/slave
- CRS devices are multi master/slave
- Most CCR devices have NO switch and can do only bridging
- **CHECK BEFORE BUY!!!!**

# Mikrotik VLAN management

- Vlan can be managed
  - from the core only
  - from the core and the switch
  - from the switch only
- Then YOU NEED A SCHEMA of the network

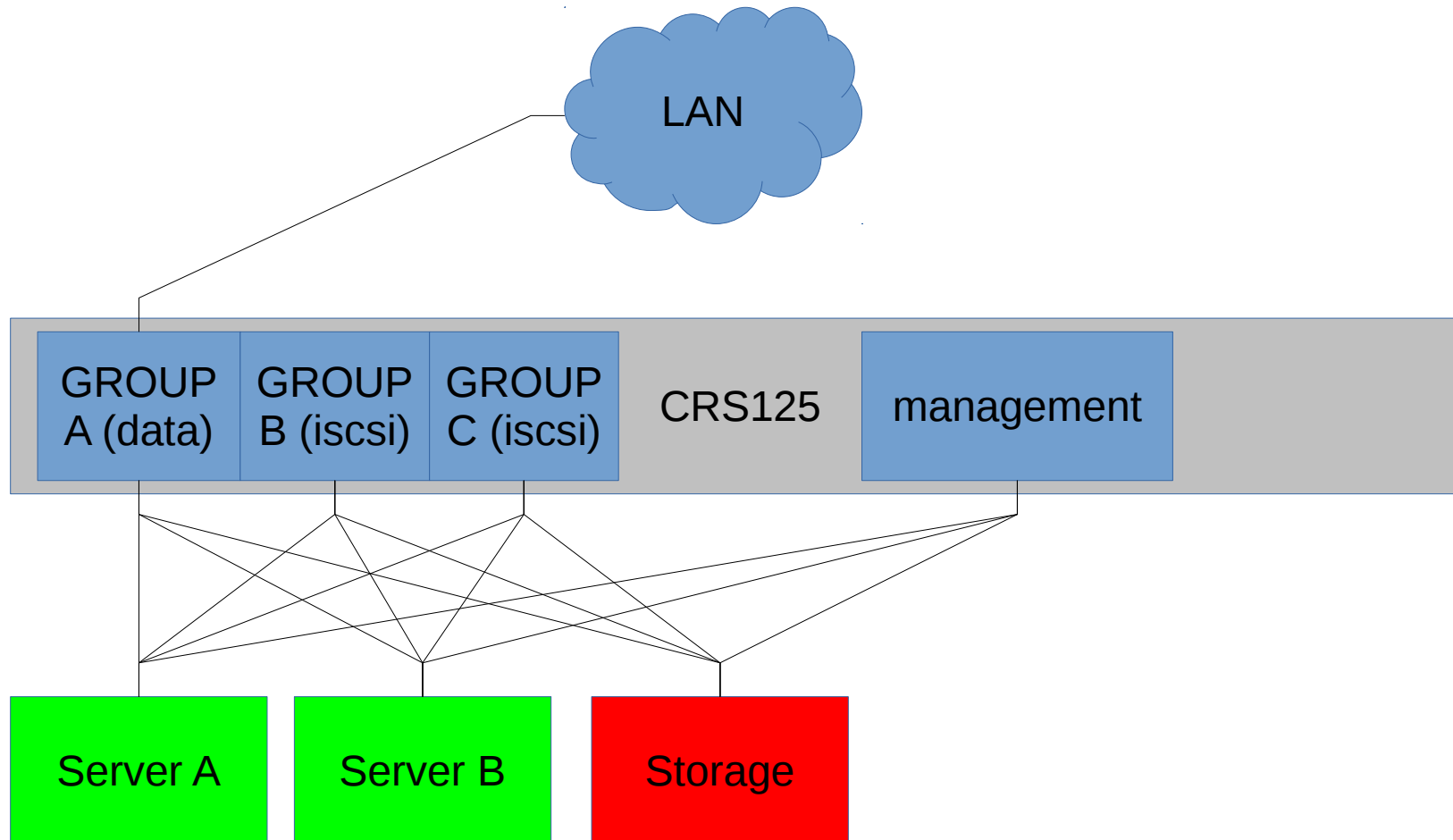
# Mikrotik VLAN management

- Device view

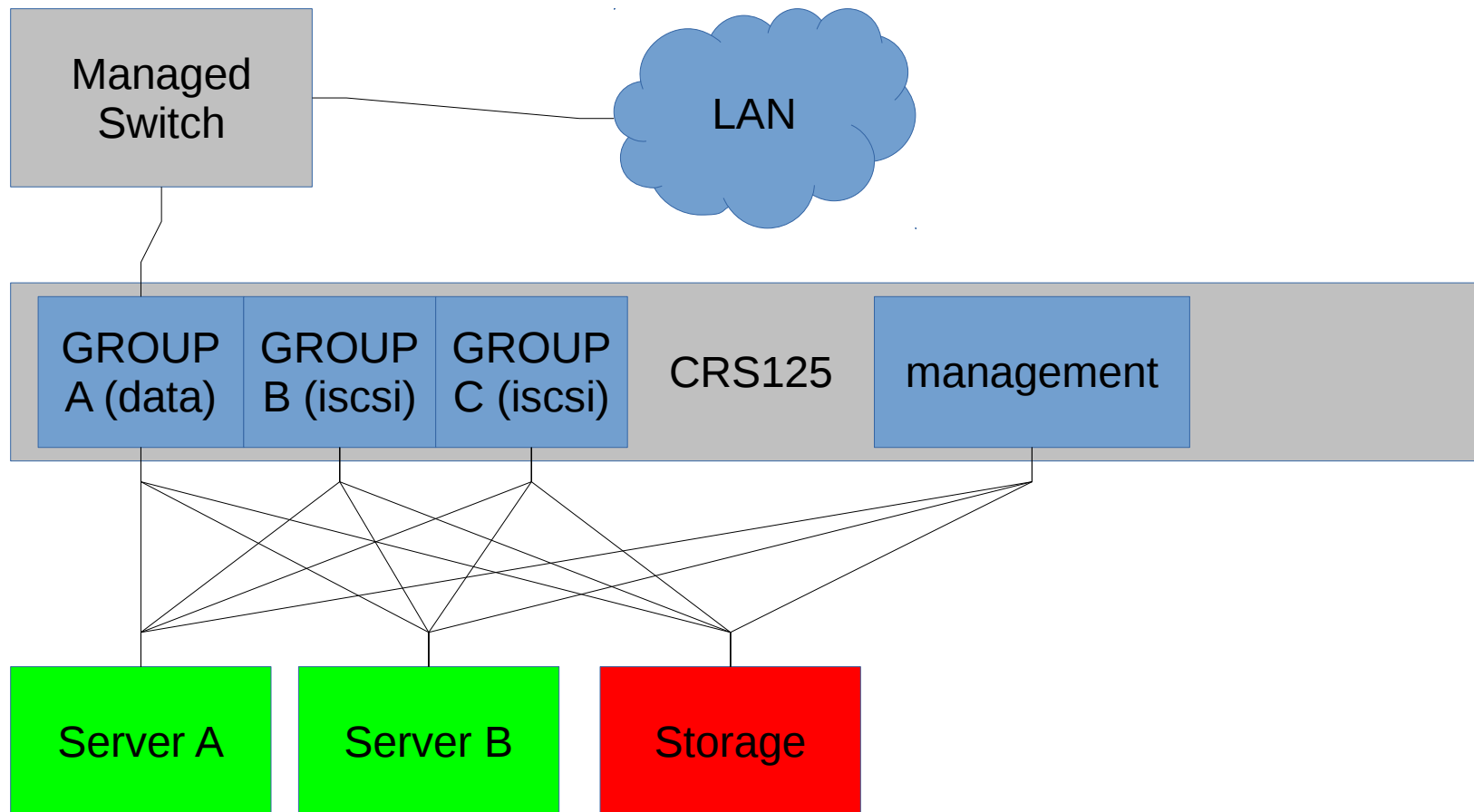
# Simple Vmware setup

- CRS125
- One or more port group for data
- One or more port group for storage (iscsi)
- No need to use VLAN!
  
- Very important add firewall rule → no storage/server traffic on the CPU, only at switch level
- And max MTU is? 4000!

# NOT OK why?



# OK spanning-tree switch!



# Trunking example

- Trunking on CRS side (hardware)

```
/interface ethernet switch trunk add name=trunk1 member-ports=ether1,ether2
```

- Trunking on ROUTEROS side (software)

```
/interface bonding add name=bonding1  
slaves=ether1,ether2 mode=balance-xor transmit-hash-  
policy=layer-2-and-3 link-monitoring=mii mii-  
interval=100ms
```

# CRS power!

- Bandwidth limiting one single port, job done at switch level (no cpu involved) works only on CRS
- We must use both “Ingress Port policer” and “Shaper”

- Ingress Port Policer set RX limit:

```
/interface ethernet switch ingress-port-policer add port=etherX  
meter-unit=bit rate=20M
```

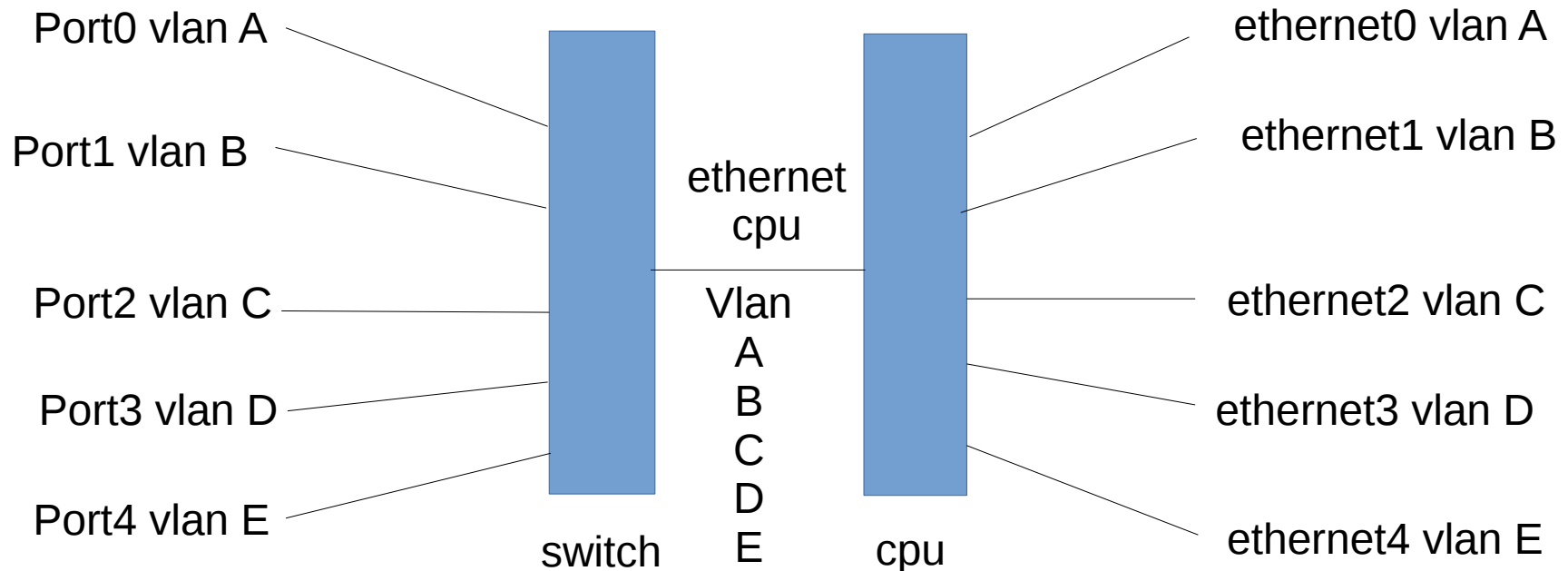
- Shaper set TX limit:

```
/interface ethernet switch shaper add port=etherX meter-unit=bit rate=20M
```



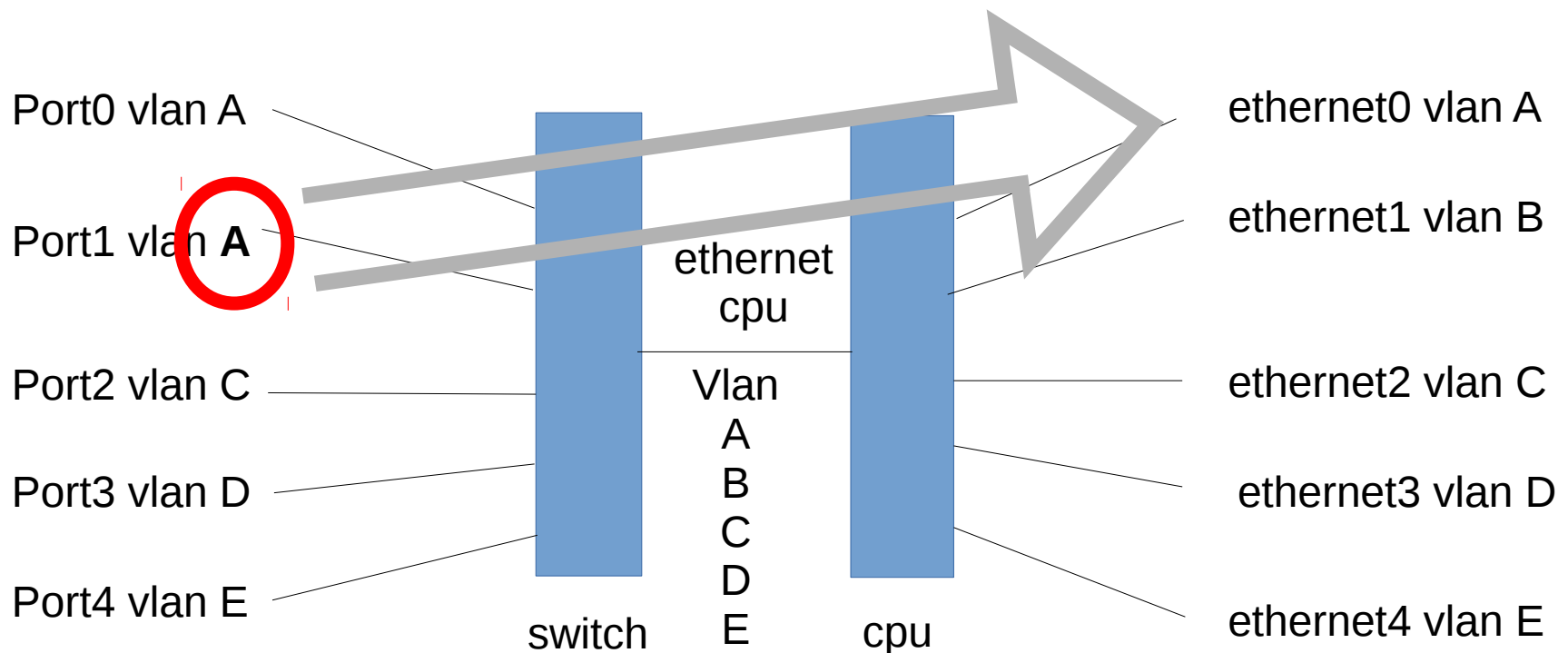
# Behind the switch

- How is possible to address each single port on Mikrotik devices?



# Behind the switch

- How is possible to address each single port on Mikrotik devices?



# Questions?



# Thank you!

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