



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

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

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- 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

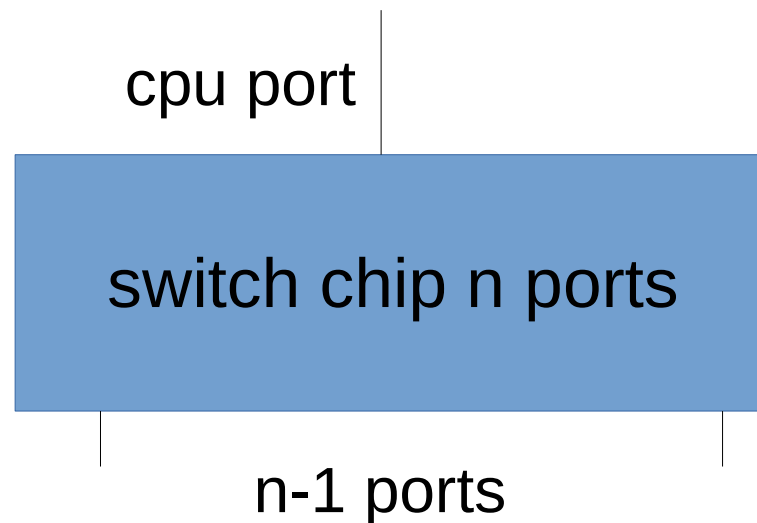
Some Switching Theory

- 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!

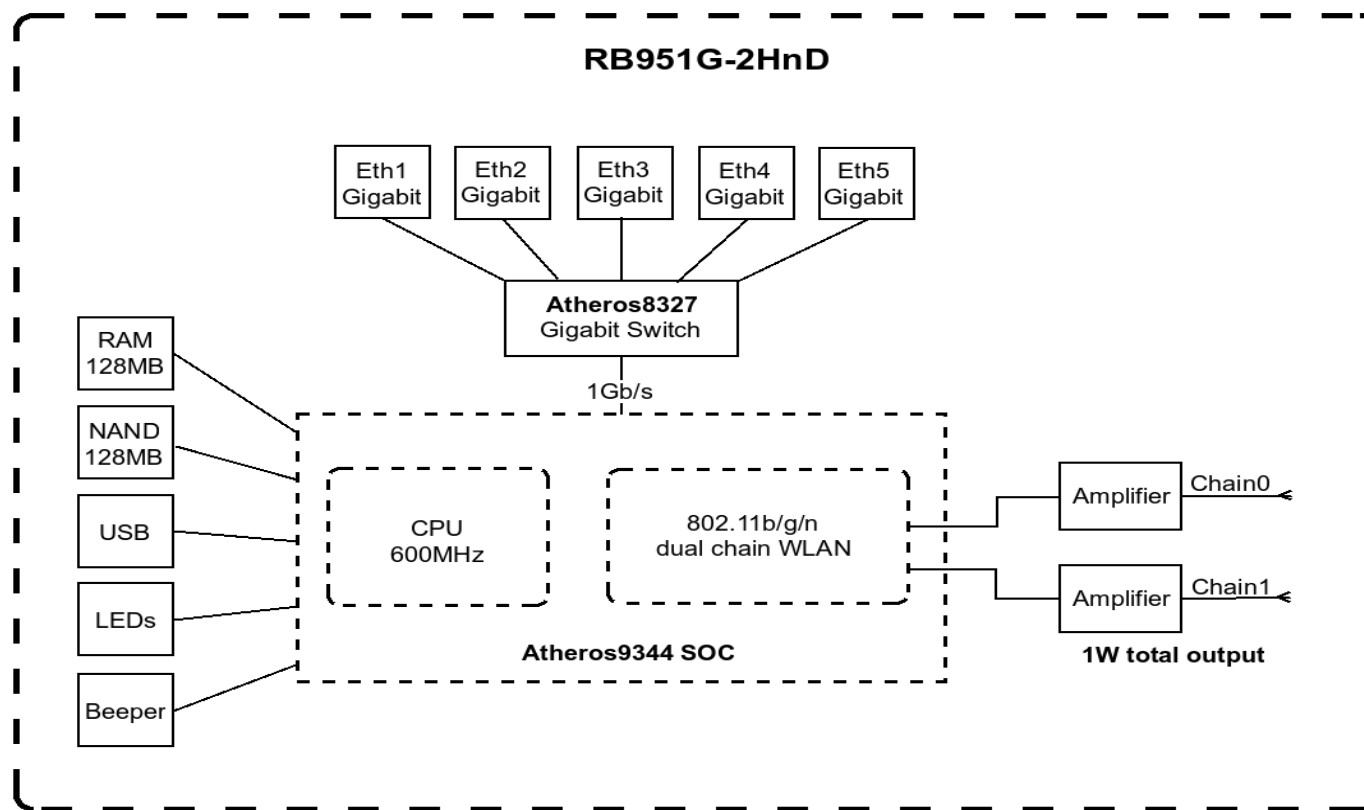
Mikrotik Switch Concept

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



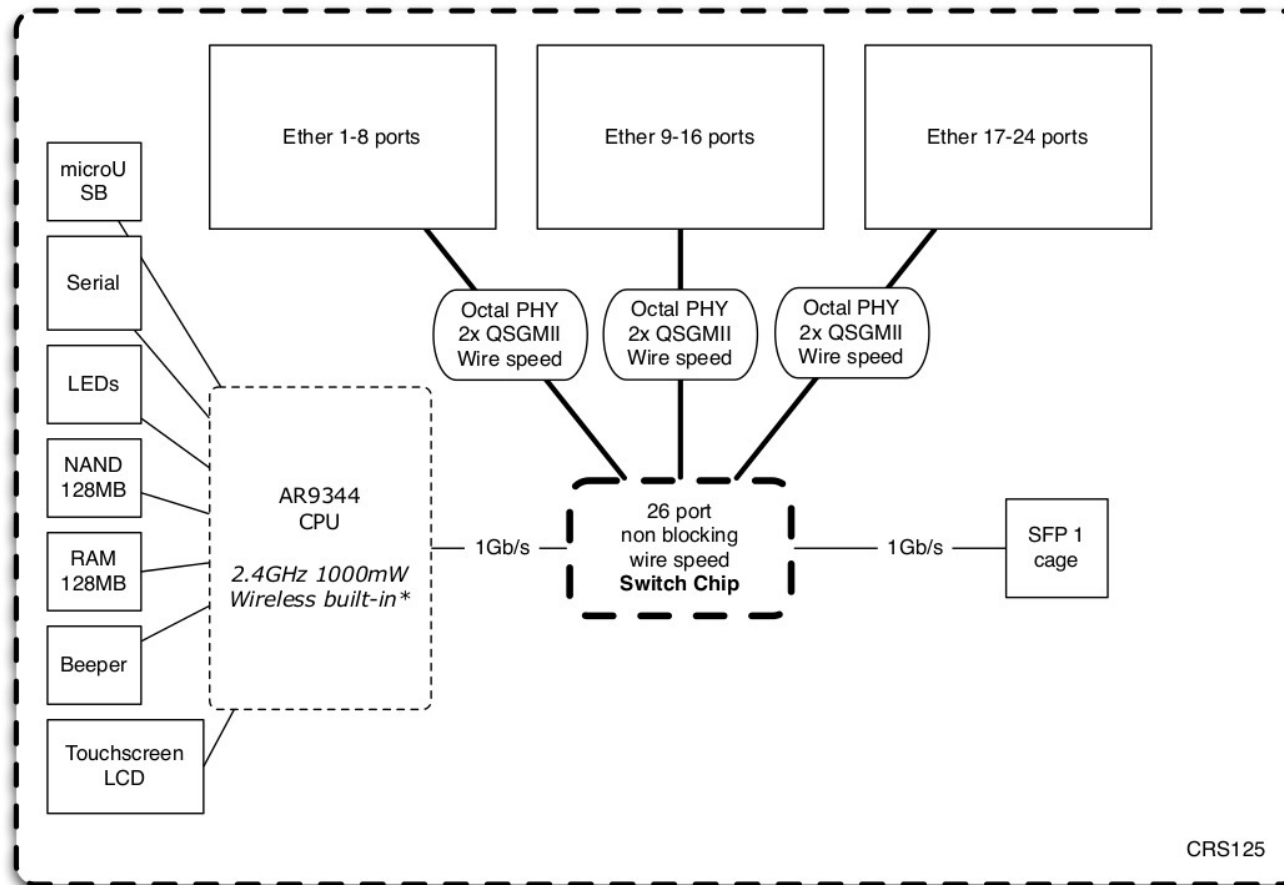
Mikrotik Switch Mixed Device

- Block diagram of a RB951G-2HnD device



Mikrotik Switch CRS125

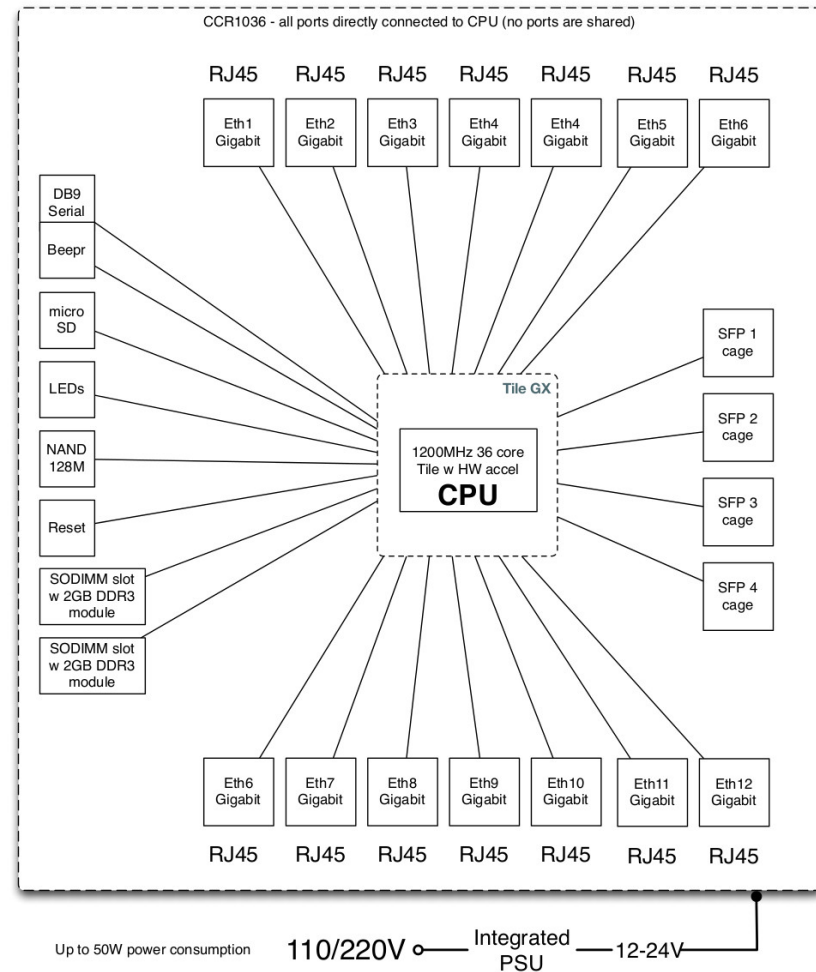
- Block diagram of CRS125 device



* - 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

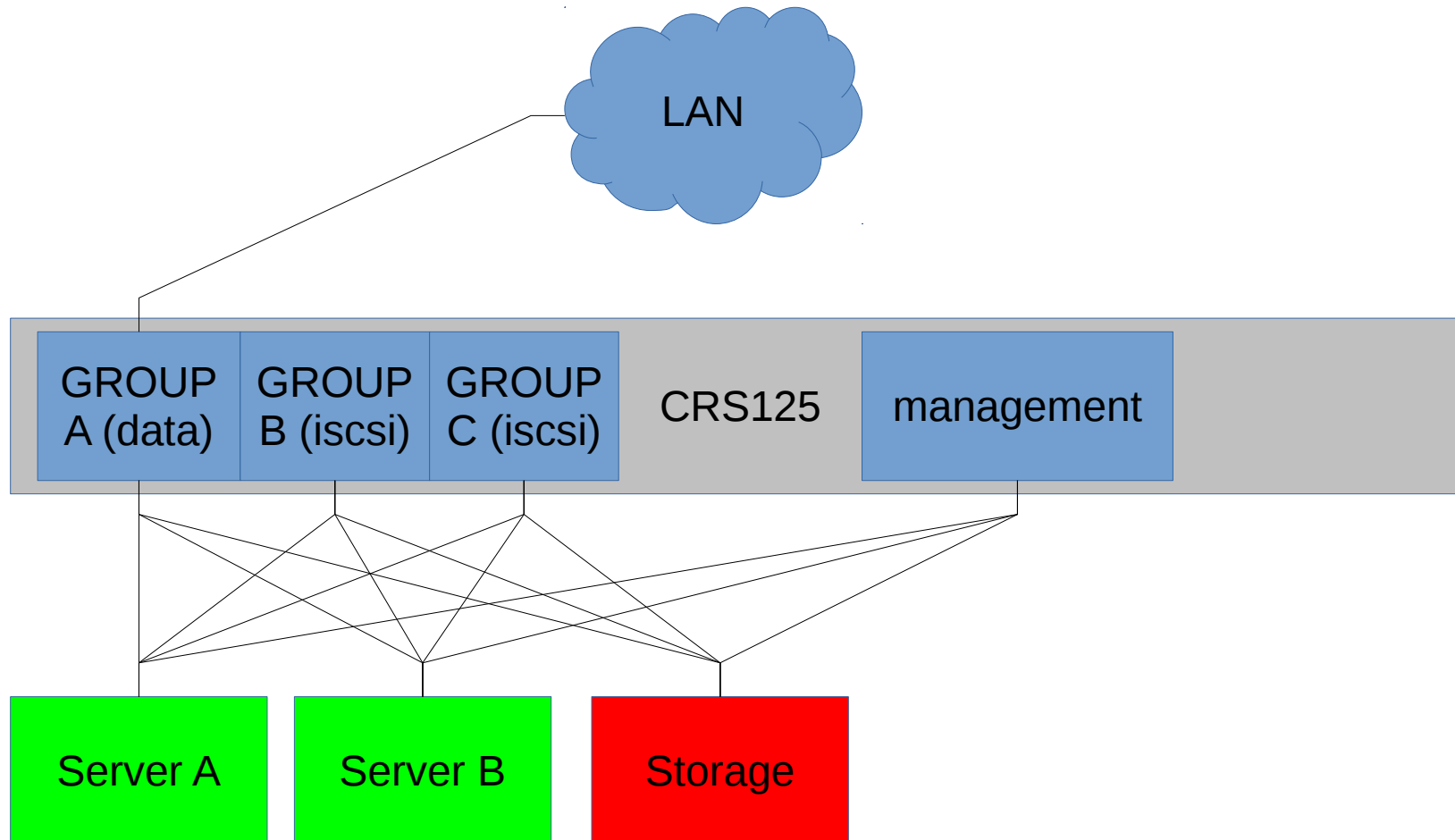
- Device view

Simple Vmware setup

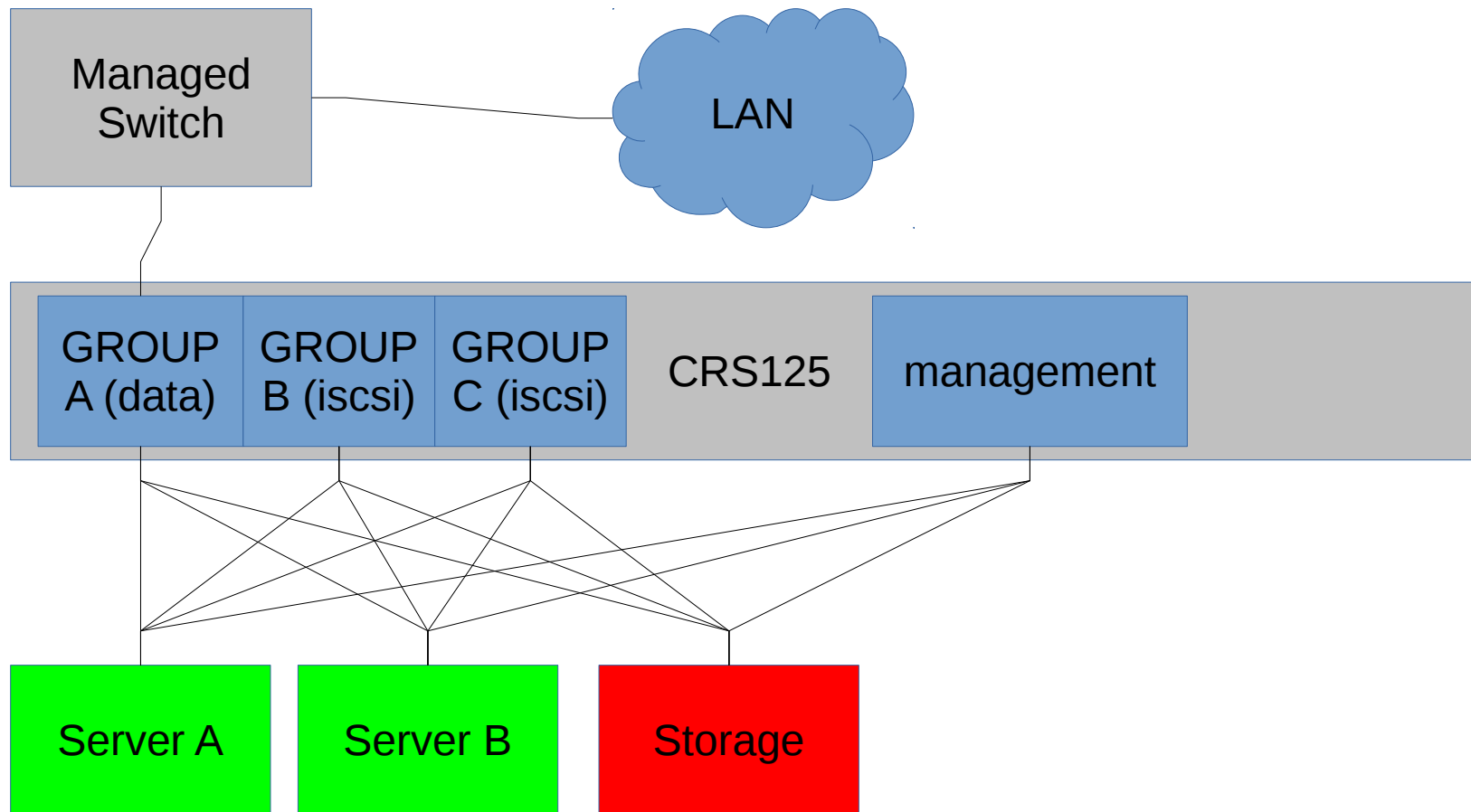
- CRS125
- One or more port group for data
- One or more port group for storage (iscsi)
- No need to use VLAN!

- 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:

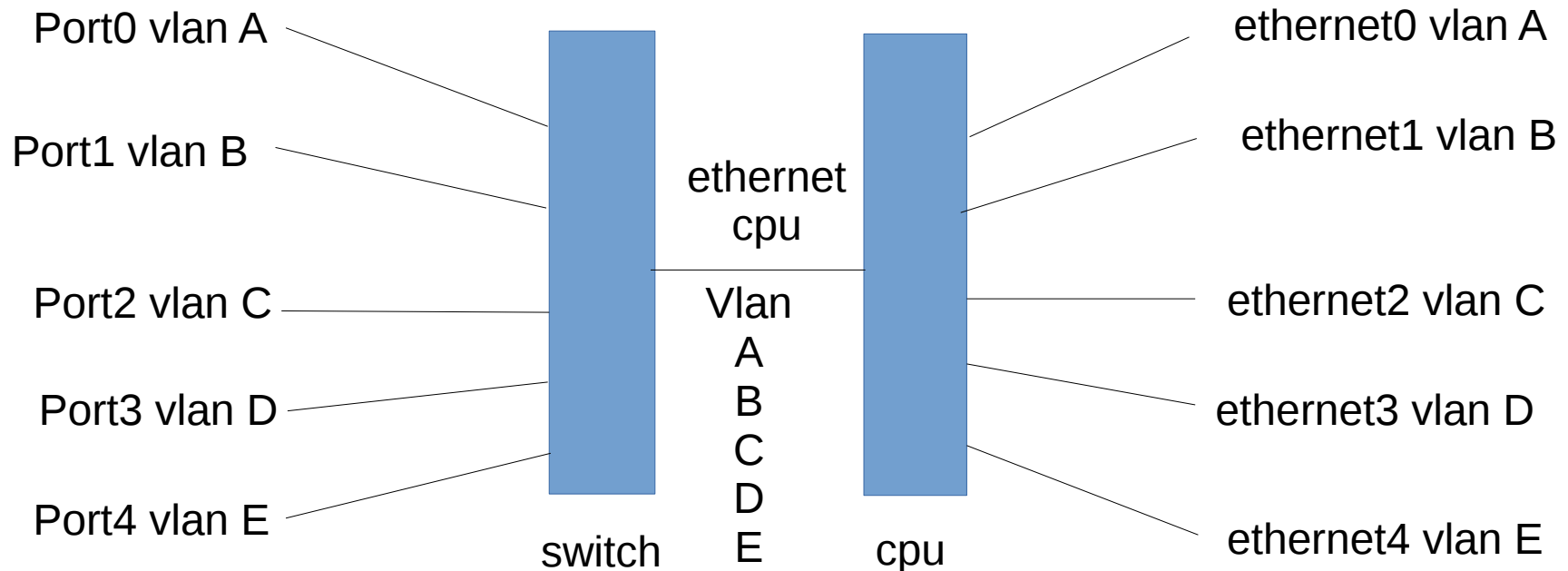
```
/interface ethernet switch ingress-port-policer add port=etherX  
meter-unit=bit rate=20M
```

- Shaper set TX limit:

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

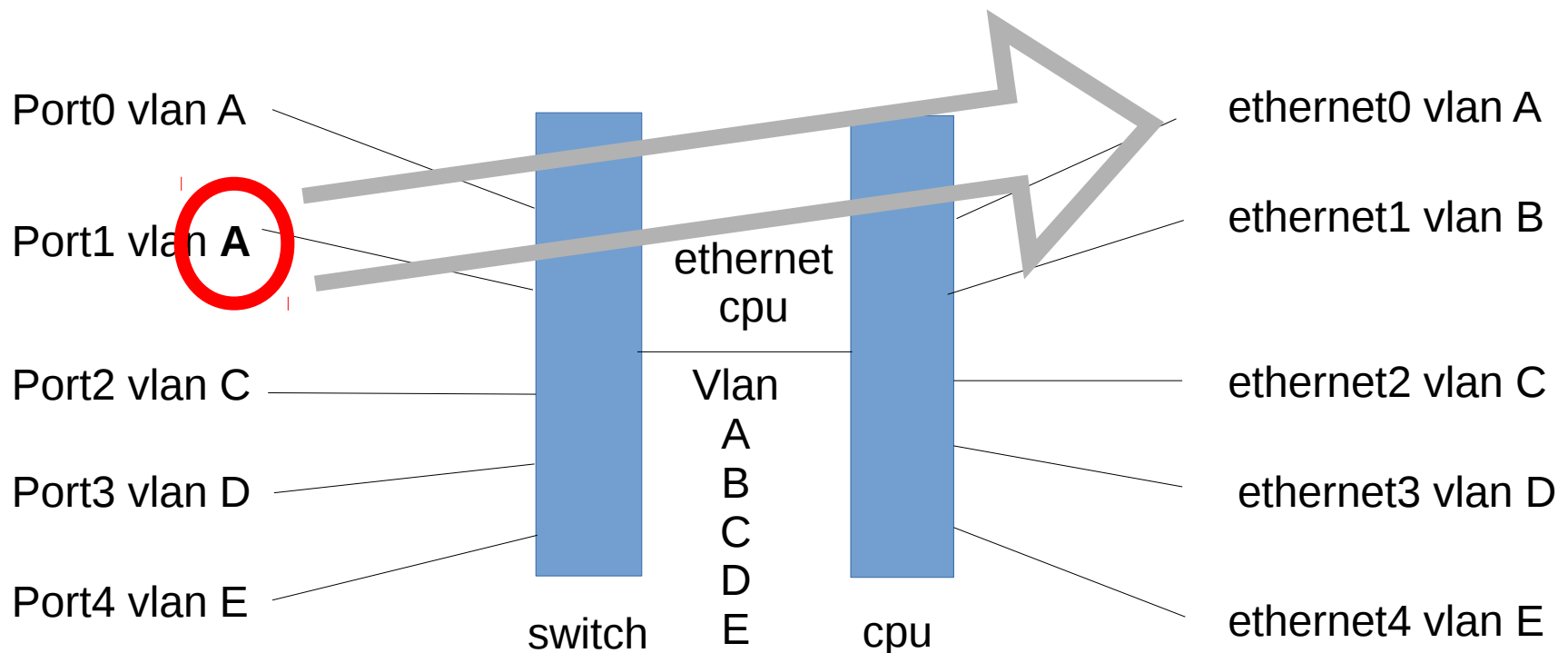

Behind the switch

- 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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