Practical Networking
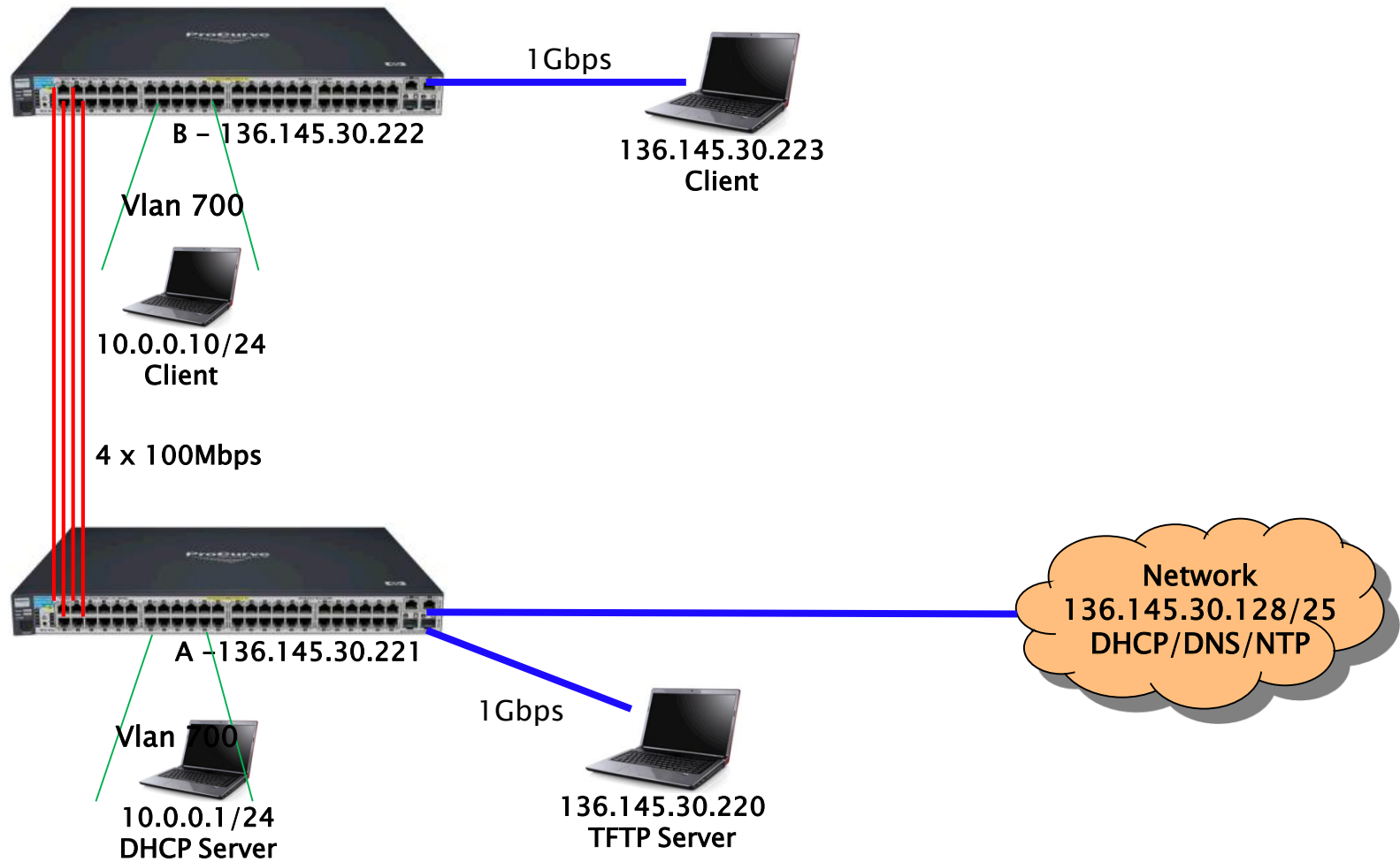
Introduction to Switches
(HP Procurve)
V 1.3

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CTI-RUM
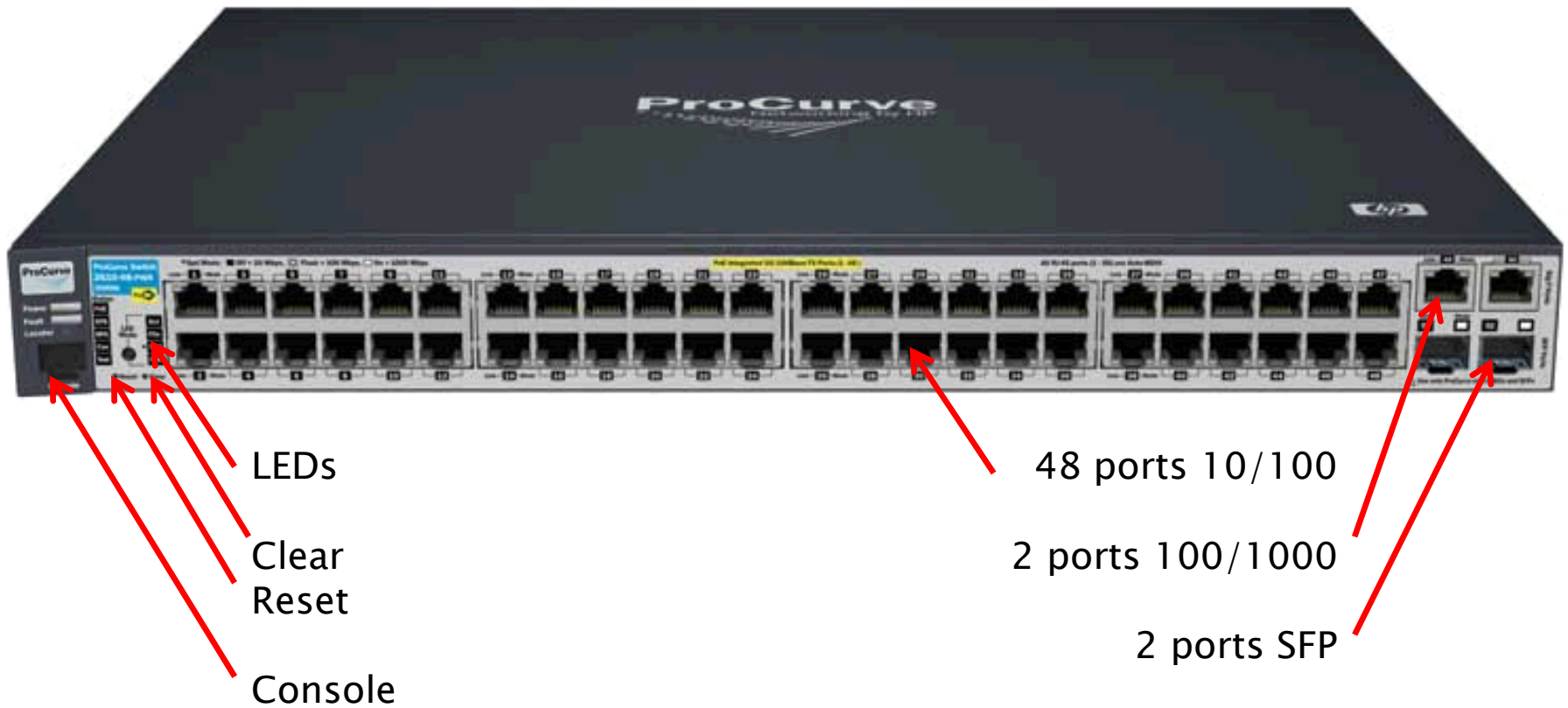
PN-Switches: Agenda

- Basic Functions
- Login
- Menu / CLI / Web
- Basic Configuration
  - Name
  - Username/Password
  - IP Address
  - SSH
- NTP
- SNMP
- Interfaces

- Trunks
- VLAN
- DHCP Snooping
- ARP / Ping
- Search MAC Address
- Filter MAC Address
- Configuration
- Backup / Restore
- Factory Reset
- Hints

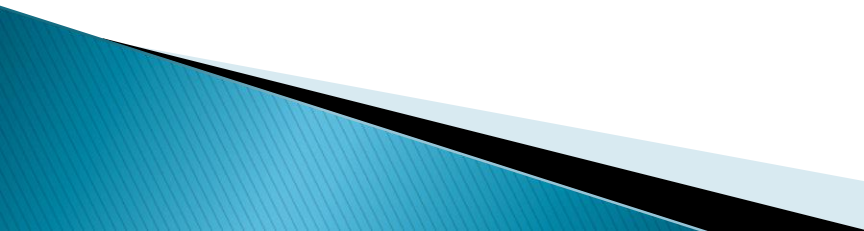# PN-Switches: Demonstration

1Gbps

B – 136.145.30.222

136.145.30.223
Client

Vlan 700

10.0.0.10/24
Client

4 x 100Mbps

Network
136.145.30.128/25
DHCP/DNS/NTP

A –136.145.30.221

Vlan 700

1Gbps

10.0.0.1/24
DHCP Server

136.145.30.220
TFTP Server

PN-Switches: HP Procurve 2610-48

LEDs

Clear
Reset

Console

48 ports 10/100

2 ports 100/1000

2 ports SFP

PN-Switches: Basic Functions

- Switch is a Layer 2 device
- Break Collision Domains
- Does NOT break Broadcast Domains
  ◦ Broadcast has a MAC [FF:FF:FF:FF:FF:FF]
- Learn MAC Address from connected devices
- Create a Table [port – MAC Address]
- Forward traffic based on destination MAC

PN-Switches: Login

- Connect to Serial Port / Telnet / SSH / HTTP
  - Serial Port settings 9600N,8,1
- Login Prompt
  - **ProCurve> Operator Level**
  - **ProCurve# Manager Level**
  - **ProCurve(config)# Global Configuration Level**
  - **ProCurve(<context>)# Context Configuration Levels**

PN-Switches: Menu / CLI / Web

```
ProCurve(config)# show running
Running configuration:
; J9220A Configuration Editor; Created on release # N.10.XX
hostname "ProCurve"
snmp-server community "notpublic" Unrestricted
vlan 1
name "DEFAULT_VLAN"
untagged 1-24
ip address dhcp-bootp
exit
password manager
password operator
```
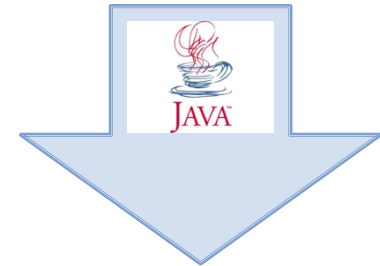


```
=========================- CONSOLE - MANAGER MO
                              Main Menu

     1. Status and Counters...
     2. Switch Configuration...
     3. Console Passwords...
     4. Event Log
     5. Command Line (CLI)
     6. Reboot Switch
     7. Download OS
     8. Run Setup
     9. Stacking...
     0. Logout
 
Provides the menu to display configuration, status, and counters.
To select menu item, press item number, or highlight item and press <Enter>.
```

```
ProCurve# menu [Enter]
```

PN-Switches: Basic Configuration 1

Name
- hostname "switch name"

```
ProCurve> enable
Password:
ProCurve# config terminal
ProCurve(config)# hostname "Demo"
Demo(config)# end
Demo# write memory
Demo#
```

PN-Switches: Basic Configuration 2

Password
- ◦ password manager user-name *username*
- ◦ password operator user-name *username*

```
Demo# config terminal
Demo(config)# password manager user-name admin
New password for Manager: ********
Please retype new password for Manager: ********
Demo(config)# end
Demo# write memory
Demo#
```

PN-Switches: Basic Configuration 3

IP Address
- Vlan 1
  - Ip address n.n.n.n m.m.m.m
  - Exit
- Ip default-gateway g.g.g.g

123.456.78.90

```
ProCurve# config term
ProCurve(config)# ip default-gateway 10.22.32.1
ProCurve(config)# vlan 1
ProCurve(vlan-1)#    ip address 10.31.22.5 255.255.255.0
ProCurve(vlan-1)# exit
ProCurve# write memory
```

PN-Switches: Basic Configuration 4

Crypto key generate ssh rsa
Ip ssh

```
ProCurve# config term
ProCurve(config)# crypto key generate ssh rsa
Installing new RSA key.  If the key/entropy cache is
depleted, this could take up to a minute.
ProCurve(config)# ip ssh
ProCurve(config)# exit
ProCurve# write memory
```

PN-Switches: NTP

sntp server n.n.n.n
timesync sntp
sntp unicast
Time timezone -240
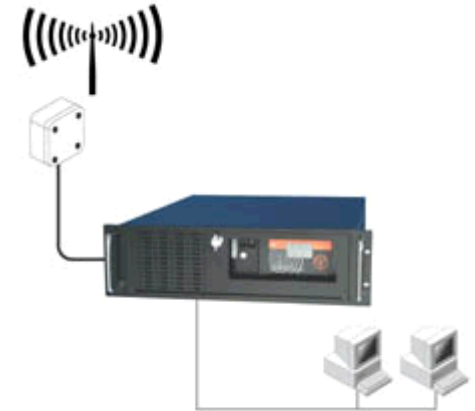
```
Demo# config term
Demo(config)# sntp server 136.145.30.2
Demo(config)# timesync sntp
Demo(config)# sntp unicast
Demo(config)# time timezone -240
Demo(config)# end
Demo# write memory
```

PN-Switches: SNMP

snmp–server community "community" operator
snmp–server contact "Admininstrator Name"
snmp–server location "switch location"

```
Demo# config term
Demo(config)# snmp-server community "rumnet2000" operator
Demo(config)# snmp-server contact "Martin Melendez"
Demo(config)# snmp-server location "Monzon-107"
Demo(config)# end
Demo# write memory
```
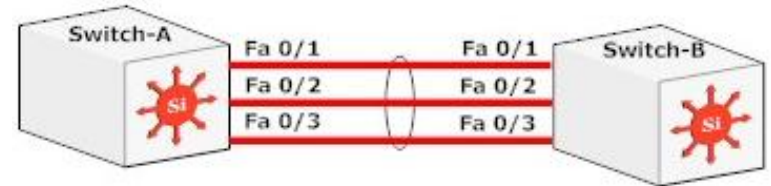
PN-Switches: Interfaces

interface eth [#]
- name
- enable / disable
- speed-duplex [auto / 100-full / 1000-full ...]

```
Demo# config term
Demo(config)# interface eth 1
Demo(eth-1)# speed-duplex 1000-full
Demo(eth-1)# end
Demo# write memory
```

PN-Switches: Trunks
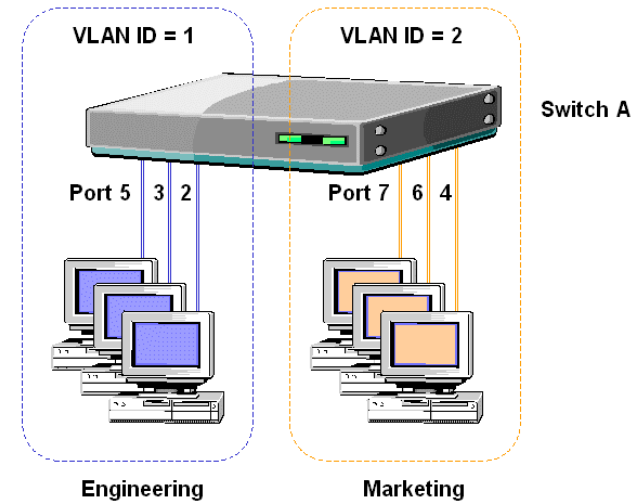
Max 8 port per trunk
Max 12 trunks per switch

trunk <port-list> < trk1 ... trk12 > < trunk | lacp >

```
Demo# config term
Demo(config)# trunk 1-4 trk1 lacp
Demo(config)# vlan 1
Demo(vlan-1)# untag trk1
Demo(vlan-1)# end
Demo# write memory
```
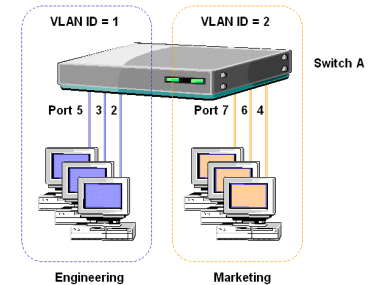
PN-Switches: VLAN

vlan [#]
- name
- tagged #
- untagged #
- ip address


```
Demo# config term
Demo(config)# vlan 123
Demo(vlan-123)# name "Lab-107"
Demo(vlan-123)# untagged 1-44
Demo(vlan-123)# ip address 136.145.123.130 255.255.255.0
Demo(vlan-123)# tagged 45-46,48
Demo(vlan-123)# end
Demo# write memory
```

PN-Switches: DHCP Snooping

VLAN ID = 1   VLAN ID = 2   Switch A
Port 5 3 2   Port 7 6 4
Engineering   Marketing

Authorize DHCP Servers (max 20)

dhcp-snooping authorized-server 10.1.1.10

Define Trusted Ports

dhcp-snooping trust 4, 5, 6, 7

Define Vlans that use this feature

dhcp-snooping vlan 1-3

Activate Globally

dhcp-snooping

```
Demo# config term
Demo(config)# dhcp-snooping authorized-server 136.145.30.2
Demo(config)# dhcp-snooping trust 23
Demo(config)# dhcp-snooping vlan 700
Demo(config)# dhcp-snooping
Demo(config)# end
Demo# write memory
```

PN-Switches: ARP / Ping

- show arp
- Ping a.b.c.d

```
Demo(config)# sh arp

 IP ARP table
  IP Address       MAC Address        Type      Port
  ---------------- ------------------ -------   ----
   10.30.0.1        00b08e-858c34      dynamic 50


Demo(config)# ping 10.30.30.101
10.30.30.101 is alive, time = 1 ms


Demo(config)# sh arp

 IP ARP table
  IP Address       MAC Address        Type      Port
  ---------------- ------------------ -------   ----
   10.30.0.1        00b08e-858c34      dynamic 50
   10.30.30.101     0026f1-56e8c0      dynamic 50
```

PN-Switches: Search MAC Address

- show mac-address [*mac-addr*]
- show mac-address [*port-list*]
- show mac-address [*vlan <vid>*]

```
ProCurve(config)# show mac-address

Status and Counters - Port Address Table

MAC Address     Located on Port
-------------- ----------------
0001e6-09620c        1
0001e7-61d4c0        2
0001e7-6025c0        3
```

PN-Switches: Filter MAC Address

▸ lockout-mac [*mac-addr*]

```
ProCurve# config term
ProCurve(config)# lockout-mac 123456-123456
ProCurve(config)# end
ProCurve# write memory
ProCurve#
ProCurve# sh lockout-mac
Locked Out Addresses
 123456-123456
Number of locked out MAC addresses = 1
ProCurve#
ProCurve# config term
ProCurve(config)# no lockout-mac 123456-123456
ProCurve(config)# end
ProCurve# write memory
ProCurve#
```

PN-Switches: Backup / Restore

copy startup-config tftp n.n.n.n filename <pc|unix>

copy tftp n.n.n.n filename startup-config <pc|unix>

```
Demo# copy startup-config tftp 10.30.1.2 switch_a_sept_10_2011.txt

Demo# copy tftp 10.30.1.2 switch_a_sept_10_2011.txt startup-config
```

PN-Switches: Factory Reset

Simultaneously press both the **Reset** and **Clear** buttons on the front of the switch. The power and fault lights come on.
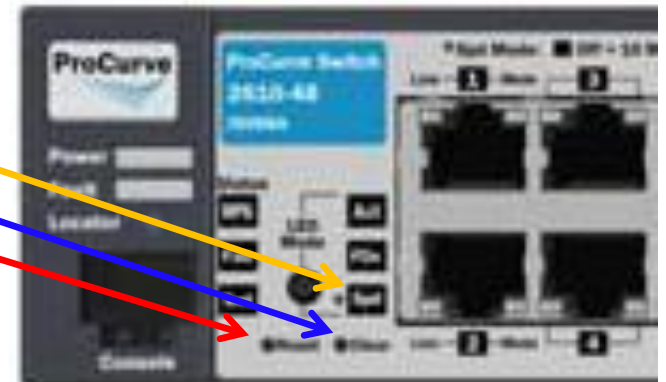
Continue to press the **Clear** button while releasing the **Reset** button.

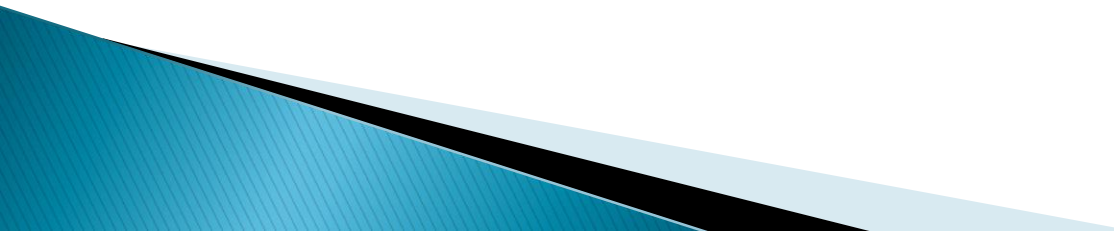When the Self Test LED begins to flash, release the **Clear** button.
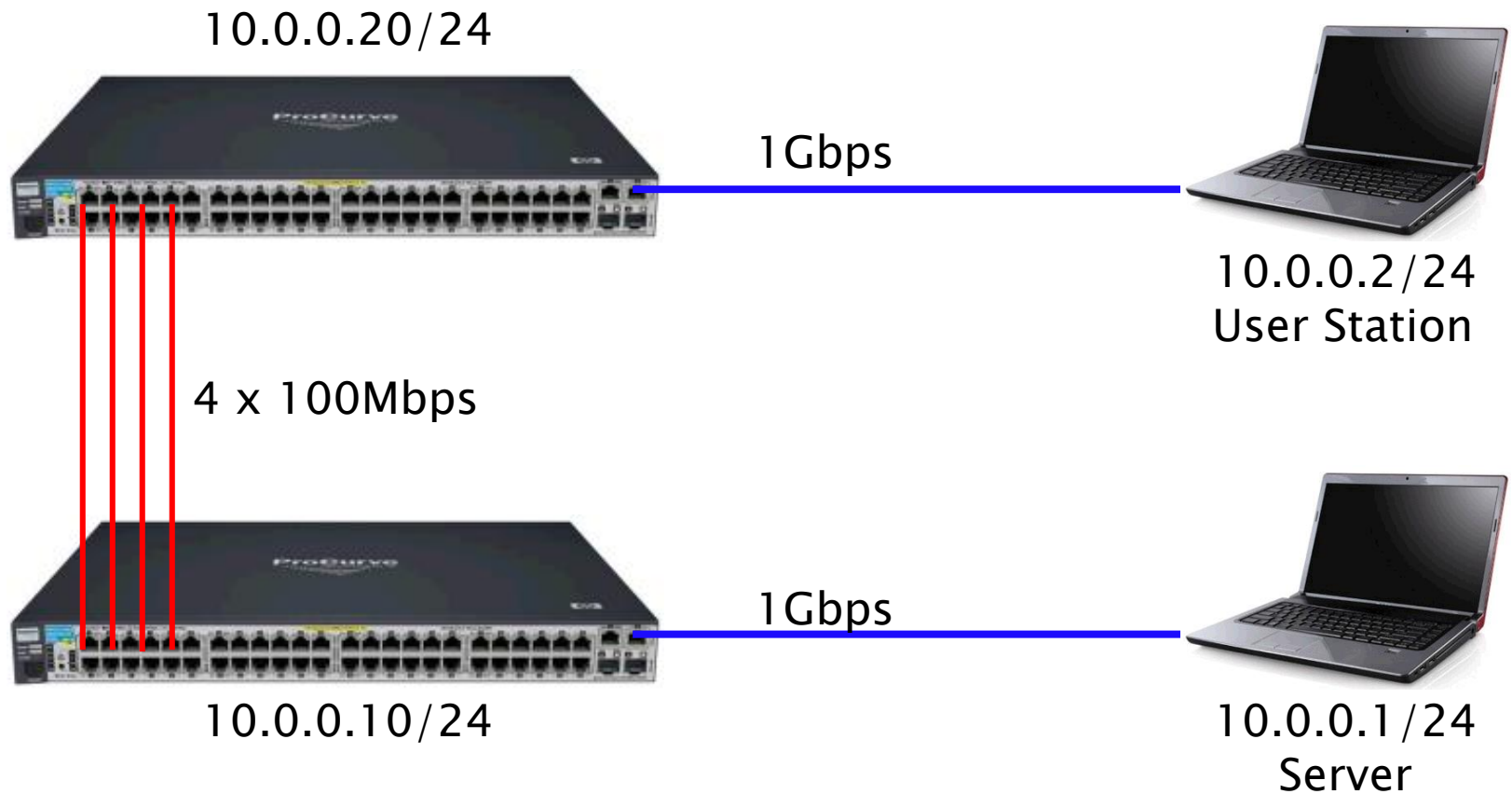
Test LED
Clear
Reset

PN-Switches: Hints

- Upgrade the Firmware

- Place the best switch where the traffic is heavier

- Use names related to locations

PN-Switches: Demonstration

10.0.0.20/24

1Gbps

10.0.0.2/24
User Station

4 x 100Mbps

1Gbps

10.0.0.10/24

10.0.0.1/24
Server

PN-Switches: Configuration

```
ProCurve> enable
Password:
ProCurve# config terminal
ProCurve(config)# hostname "ProCurve Switch"
ProCurve(config)# ip default-gateway 10.22.32.1
ProCurve(config)# snmp-server community "public" Unrestricted
ProCurve(config)# vlan 1
ProCurve(vlan-1)#    name "DEFAULT VLAN"
ProCurve(vlan-1)#    untagged 1,7-10,13-14
ProCurve(vlan-1)#    tagged 4-6
ProCurve(vlan-1)#    no untagged 2-3
ProCurve(vlan-1)#    ip address 10.31.22.5 255.255.255.0
ProCurve(vlan-1)# exit
ProCurve(config)# int eth 6
ProCurve(eth-6)# speed-duplex 100-full
ProCurve(eth-6)# exit
ProCurve(config)# password manager
ProCurve(config)# Password operator
```