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# **Universidad Nacional de La Matanza**

## Departamento de Ingeniería e Investigaciones Tecnológicas

# **Redes de Computadoras - Verano**

# **TP Nº 2**

## **“Introducción Packet Tracer”**

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* 1. Al estar en modo usuario y escribir “?” se muestran los comandos disponibles de ese modo. Desde el modo privilegiado, se puede notar que se muestran más comandos que los disponibles en el modo anterior.
  2. Una vez seteada la contraseña para modo usuario, cuando cualquier usuario intente entrar a la consola del router pedirá una contraseña, con un timeout si se demora demasiado en escribirla. Poner las contraseñas en texto encriptado o claro funciona exactamente igual a la hora de loguearse. La diferencia está en cómo la guarda.
  3. Verificamos los comandos show:

## Show version

Este comando muestra la configuración del hardware, la versión del software, los nombres y orígenes de los archivos de configuración, las imágenes de arranque y tiempo que ha estado corriendo el router desde que se encendió.

Router1#show version

Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE (fc2)

Technical Support: http://www.cisco.com/techsupport

Copyright (c) 1986-2007 by Cisco Systems, Inc.

Compiled Wed 23-Feb-11 14:19 by pt\_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)

cisco1941 uptime is 54 minutes, 30 seconds

System returned to ROM by power-on

System image file is "flash0:c1900-universalk9-mz.SPA.151-1.M4.bin"

Last reload type: Normal Reload

This product contains cryptographic features and is subject to United

States and local country laws governing import, export, transfer and

use. Delivery of Cisco cryptographic products does not imply

third-party authority to import, export, distribute or use encryption.

Importers, exporters, distributors and users are responsible for

compliance with U.S. and local country laws. By using this product you

agree to comply with applicable laws and regulations. If you are unable

to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:

http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to

export@cisco.com.

Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.

Processor board ID FTX152400KS

2 Gigabit Ethernet interfaces

2 Low-speed serial(sync/async) network interface(s)

DRAM configuration is 64 bits wide with parity disabled.

255K bytes of non-volatile configuration memory.

249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

-------------------------------------------------

Device# PID SN

-------------------------------------------------

\*0 CISCO1941/K9 FTX15244Y8J-

Technology Package License Information for Module:'c1900'

----------------------------------------------------------------

Technology Technology-package Technology-package

Current Type Next reboot

-----------------------------------------------------------------

ipbase ipbasek9 Permanent ipbasek9

security disable None None

data disable None None

Configuration register is 0x2102

## Show running-config

Este comando muestra la configuración con la que está corriendo actualmente. No necesariamente se va a mantener si se reinicia el dispositivo. Para ver con qué configuración bootea, ejecutar show startup-config.

Router1# show running-config

Building configuration...

Current configuration : 910 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Router1

!

!

!

!

!

!

!

!

no ip cef

no ipv6 cef

!

!

!

!

license udi pid CISCO1941/K9 sn FTX15244Y8J-

!

!

!

!

!

!

!

!

!

ip host Router1 192.168.1.1 192.168.3.1 172.16.0.1

!

!

spanning-tree mode pvst

!

!

!

!

!

!

interface GigabitEthernet0/0

ip address 172.16.0.1 255.255.0.0

duplex auto

speed auto

!

interface GigabitEthernet0/1

no ip address

duplex auto

speed auto

shutdown

!

interface Serial0/1/0

ip address 192.168.3.1 255.255.255.0

!

interface Serial0/1/1

ip address 192.168.1.1 255.255.255.0

clock rate 2000000

!

interface Vlan1

no ip address

shutdown

!

ip classless

ip route 172.17.0.0 255.255.0.0 192.168.1.2

ip route 172.18.0.0 255.255.0.0 192.168.3.2

!

ip flow-export version 9

!

!

!

!

!

!

!

!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end

## Show interfaces

Este comando muestra todas las interfaces disponibles del dispositivo, su estado, configuración, especificaciones de hardware y estadísticas sobre cuántos paquetes recibieron, errores, broadcast, etc.

Router1#show interfaces

GigabitEthernet0/0 is up, line protocol is up (connected)

Hardware is CN Gigabit Ethernet, address is 00e0.8fdd.c401 (bia 00e0.8fdd.c401)

Internet address is 172.16.0.1/16

MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,

reliability 255/255, txload 1/255, rxload 1/255

Encapsulation ARPA, loopback not set

Keepalive set (10 sec)

Full-duplex, 100Mb/s, media type is RJ45

output flow-control is unsupported, input flow-control is unsupported

ARP type: ARPA, ARP Timeout 04:00:00,

Last input 00:00:08, output 00:00:05, output hang never

Last clearing of "show interface" counters never

Input queue: 0/75/0 (size/max/drops); Total output drops: 0

Queueing strategy: fifo

Output queue :0/40 (size/max)

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

0 packets input, 0 bytes, 0 no buffer

Received 0 broadcasts, 0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort

0 watchdog, 1017 multicast, 0 pause input

0 input packets with dribble condition detected

0 packets output, 0 bytes, 0 underruns

0 output errors, 0 collisions, 1 interface resets

0 unknown protocol drops

0 babbles, 0 late collision, 0 deferred

0 lost carrier, 0 no carrier

0 output buffer failures, 0 output buffers swapped out

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Hardware is CN Gigabit Ethernet, address is 00e0.8fdd.c402 (bia 00e0.8fdd.c402)

MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,

reliability 255/255, txload 1/255, rxload 1/255

Encapsulation ARPA, loopback not set

Keepalive set (10 sec)

Full-duplex, 100Mb/s, media type is RJ45

output flow-control is unsupported, input flow-control is unsupported

ARP type: ARPA, ARP Timeout 04:00:00,

Last input 00:00:08, output 00:00:05, output hang never

Last clearing of "show interface" counters never

Input queue: 0/75/0 (size/max/drops); Total output drops: 0

Queueing strategy: fifo

Output queue :0/40 (size/max)

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

0 packets input, 0 bytes, 0 no buffer

Received 0 broadcasts, 0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort

0 watchdog, 1017 multicast, 0 pause input

0 input packets with dribble condition detected

0 packets output, 0 bytes, 0 underruns

0 output errors, 0 collisions, 2 interface resets

0 unknown protocol drops

0 babbles, 0 late collision, 0 deferred

0 lost carrier, 0 no carrier

0 output buffer failures, 0 output buffers swapped out

Serial0/1/0 is up, line protocol is up (connected)

Hardware is HD64570

Internet address is 192.168.3.1/24

MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,

reliability 255/255, txload 1/255, rxload 1/255

Encapsulation HDLC, loopback not set, keepalive set (10 sec)

Last input never, output never, output hang never

Last clearing of "show interface" counters never

Input queue: 0/75/0 (size/max/drops); Total output drops: 0

Queueing strategy: weighted fair

Output queue: 0/1000/64/0 (size/max total/threshold/drops)

Conversations 0/0/256 (active/max active/max total)

Reserved Conversations 0/0 (allocated/max allocated)

Available Bandwidth 1158 kilobits/sec

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

0 packets input, 0 bytes, 0 no buffer

Received 0 broadcasts, 0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort

0 packets output, 0 bytes, 0 underruns

0 output errors, 0 collisions, 1 interface resets

0 output buffer failures, 0 output buffers swapped out

0 carrier transitions

DCD=up DSR=up DTR=up RTS=up CTS=up

Serial0/1/1 is up, line protocol is up (connected)

Hardware is HD64570

Internet address is 192.168.1.1/24

MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,

reliability 255/255, txload 1/255, rxload 1/255

Encapsulation HDLC, loopback not set, keepalive set (10 sec)

Last input never, output never, output hang never

Last clearing of "show interface" counters never

Input queue: 0/75/0 (size/max/drops); Total output drops: 0

Queueing strategy: weighted fair

Output queue: 0/1000/64/0 (size/max total/threshold/drops)

Conversations 0/0/256 (active/max active/max total)

Reserved Conversations 0/0 (allocated/max allocated)

Available Bandwidth 1158 kilobits/sec

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

0 packets input, 0 bytes, 0 no buffer

Received 0 broadcasts, 0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort

0 packets output, 0 bytes, 0 underruns

0 output errors, 0 collisions, 1 interface resets

0 output buffer failures, 0 output buffers swapped out

0 carrier transitions

DCD=up DSR=up DTR=up RTS=up CTS=up

Vlan1 is administratively down, line protocol is down

Hardware is CPU Interface, address is 0005.5ea3.d070 (bia 0005.5ea3.d070)

MTU 1500 bytes, BW 100000 Kbit, DLY 1000000 usec,

reliability 255/255, txload 1/255, rxload 1/255

Encapsulation ARPA, loopback not set

ARP type: ARPA, ARP Timeout 04:00:00

Last input 21:40:21, output never, output hang never

Last clearing of "show interface" counters never

Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0

Queueing strategy: fifo

Output queue: 0/40 (size/max)

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

1682 packets input, 530955 bytes, 0 no buffer

Received 0 broadcasts (0 IP multicast)

0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored

563859 packets output, 0 bytes, 0 underruns

0 output errors, 23 interface resets

0 output buffer failures, 0 output buffers swapped out

## Show Controllers

Este comando muestra las especificaciones físicas del router

Router1#show controllers

Interface Serial0/1/0

Hardware is PowerQUICC MPC860

DTE V.35 TX and RX clocks detected

idb at 0x81081AC4, driver data structure at 0x81084AC0

SCC Registers:

General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8

Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00

Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E

Interrupt Registers:

Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000

Mask [CIMR]=0x00200000, In-srv [CISR]=0x00000000

Command register [CR]=0x580

Port A [PADIR]=0x1030, [PAPAR]=0xFFFF

[PAODR]=0x0010, [PADAT]=0xCBFF

Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E

[PBODR]=0x00000, [PBDAT]=0x3FFFD

Port C [PCDIR]=0x00C, [PCPAR]=0x200

[PCSO]=0xC20, [PCDAT]=0xDF2, [PCINT]=0x00F

Receive Ring

rmd(68012830): status 9000 length 60C address 3B6DAC4

rmd(68012838): status B000 length 60C address 3B6D444

Transmit Ring

tmd(680128B0): status 0 length 0 address 0

tmd(680128B8): status 0 length 0 address 0

tmd(680128C0): status 0 length 0 address 0

tmd(680128C8): status 0 length 0 address 0

tmd(680128D0): status 0 length 0 address 0

tmd(680128D8): status 0 length 0 address 0

tmd(680128E0): status 0 length 0 address 0

tmd(680128E8): status 0 length 0 address 0

tmd(680128F0): status 0 length 0 address 0

tmd(680128F8): status 0 length 0 address 0

tmd(68012900): status 0 length 0 address 0

tmd(68012908): status 0 length 0 address 0

tmd(68012910): status 0 length 0 address 0

tmd(68012918): status 0 length 0 address 0

tmd(68012920): status 0 length 0 address 0

tmd(68012928): status 2000 length 0 address 0

tx\_limited=1(2)

SCC GENERAL PARAMETER RAM (at 0x68013C00)

Rx BD Base [RBASE]=0x2830, Fn Code [RFCR]=0x18

Tx BD Base [TBASE]=0x28B0, Fn Code [TFCR]=0x18

Max Rx Buff Len [MRBLR]=1548

Rx State [RSTATE]=0x0, BD Ptr [RBPTR]=0x2830

Tx State [TSTATE]=0x4000, BD Ptr [TBPTR]=0x28B0

SCC HDLC PARAMETER RAM (at 0x68013C38)

CRC Preset [C\_PRES]=0xFFFF, Mask [C\_MASK]=0xF0B8

Errors: CRC [CRCEC]=0, Aborts [ABTSC]=0, Discards [DISFC]=0

Nonmatch Addr Cntr [NMARC]=0

Retry Count [RETRC]=0

Max Frame Length [MFLR]=1608

Rx Int Threshold [RFTHR]=0, Frame Cnt [RFCNT]=0

User-defined Address 0000/0000/0000/0000

User-defined Address Mask 0x0000

buffer size 1524

PowerQUICC SCC specific errors:

0 input aborts on receiving flag sequence

0 throttles, 0 enables

0 overruns

0 transmitter underruns

0 transmitter CTS losts

0 aborted short frames

Interface Serial0/1/1

Hardware is PowerQUICC MPC860

DCE V.35, clock rate 2000000

idb at 0x81081AC4, driver data structure at 0x81084AC0

SCC Registers:

General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8

Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00

Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E

Interrupt Registers:

Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000

Mask [CIMR]=0x00200000, In-srv [CISR]=0x00000000

Command register [CR]=0x580

Port A [PADIR]=0x1030, [PAPAR]=0xFFFF

[PAODR]=0x0010, [PADAT]=0xCBFF

Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E

[PBODR]=0x00000, [PBDAT]=0x3FFFD

Port C [PCDIR]=0x00C, [PCPAR]=0x200

[PCSO]=0xC20, [PCDAT]=0xDF2, [PCINT]=0x00F

Receive Ring

rmd(68012830): status 9000 length 60C address 3B6DAC4

rmd(68012838): status B000 length 60C address 3B6D444

Transmit Ring

tmd(680128B0): status 0 length 0 address 0

tmd(680128B8): status 0 length 0 address 0

tmd(680128C0): status 0 length 0 address 0

tmd(680128C8): status 0 length 0 address 0

tmd(680128D0): status 0 length 0 address 0

tmd(680128D8): status 0 length 0 address 0

tmd(680128E0): status 0 length 0 address 0

tmd(680128E8): status 0 length 0 address 0

tmd(680128F0): status 0 length 0 address 0

tmd(680128F8): status 0 length 0 address 0

tmd(68012900): status 0 length 0 address 0

tmd(68012908): status 0 length 0 address 0

tmd(68012910): status 0 length 0 address 0

tmd(68012918): status 0 length 0 address 0

tmd(68012920): status 0 length 0 address 0

tmd(68012928): status 2000 length 0 address 0

tx\_limited=1(2)

SCC GENERAL PARAMETER RAM (at 0x68013C00)

Rx BD Base [RBASE]=0x2830, Fn Code [RFCR]=0x18

Tx BD Base [TBASE]=0x28B0, Fn Code [TFCR]=0x18

Max Rx Buff Len [MRBLR]=1548

Rx State [RSTATE]=0x0, BD Ptr [RBPTR]=0x2830

Tx State [TSTATE]=0x4000, BD Ptr [TBPTR]=0x28B0

SCC HDLC PARAMETER RAM (at 0x68013C38)

CRC Preset [C\_PRES]=0xFFFF, Mask [C\_MASK]=0xF0B8

Errors: CRC [CRCEC]=0, Aborts [ABTSC]=0, Discards [DISFC]=0

Nonmatch Addr Cntr [NMARC]=0

Retry Count [RETRC]=0

Max Frame Length [MFLR]=1608

Rx Int Threshold [RFTHR]=0, Frame Cnt [RFCNT]=0

User-defined Address 0000/0000/0000/0000

User-defined Address Mask 0x0000

buffer size 1524

PowerQUICC SCC specific errors:

0 input aborts on receiving flag sequence

0 throttles, 0 enables

0 overruns

0 transmitter underruns

0 transmitter CTS losts

0 aborted short frames

## Show flash

Este comando muestra qué archivos residen en la memoria flash del dispositivo, cuánto ocupan y cuánto espacio queda libre.

Router1#show flash

System flash directory:

File Length Name/status

3 33591768 c1900-universalk9-mz.SPA.151-4.M4.bin

2 28282 sigdef-category.xml

1 227537 sigdef-default.xml

[33847587 bytes used, 221896413 available, 255744000 total]

249856K bytes of processor board System flash (Read/Write)

## Show history

Este comando muestra el historial de comandos que se ejecutaron en la sesión actual.

Router1# show history

conf t

show hosts

write

show startup-config

show running-config

show interfaces

clear

show interfaces

show flash

show history

## Show users

Este comando muestra los usuarios conectados actualmente a este dispositivo, sea por línea de comando, por Telnet, etc.

Router1#show users

Line User Host(s) Idle Location

\* 0 con 0 idle 00:00:00

134 vty 0 idle 00:03:21 172.16.0.3

Interface User Mode Idle Peer Address

1. Antes de configurar las tablas de routeo de forma manual en cada router, el comando ping solo funciona con las interfaces directamente conectadas al switch de la misma LAN. Esto es porque cuando al router le llega un paquete dirigido a una IP que no pertenece a la LAN, no sabe hacia dónde enviarlo y lo descarta.   
   Una vez creada la tabla de routeo, el router lo va a enviar por la conexión WAN al siguiente router y este lo va a dirigir al host correspondiente. Pero cuando el host responda al ping, el router de su LAN (que todavía no tiene su tabla creada) no va a saber por dónde enviar la respuesta. Recién cuando todas las tablas de routeo estén configuradas en todos los routers, todos los hosts van a ser capaces de hacer y responder pings contra cualquier otro host.  
   Show ip route una vez creada la tabla para el Router1:

Router1#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks

C 172.16.0.0/16 is directly connected, GigabitEthernet0/0

L 172.16.0.1/32 is directly connected, GigabitEthernet0/0

S 172.17.0.0/16 [1/0] via 192.168.1.2

S 172.18.0.0/16 [1/0] via 192.168.3.2

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.1.0/24 is directly connected, Serial0/1/1

L 192.168.1.1/32 is directly connected, Serial0/1/1

192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.3.0/24 is directly connected, Serial0/1/0

L 192.168.3.1/32 is directly connected, Serial0/1/0

1. Asociamos los nombres de hosts a sus respectivas IPs y ejecutamos show hosts.

Router1#show hosts

Default Domain is not set

Name/address lookup uses domain service

Name servers are 255.255.255.255

Codes: UN - unknown, EX - expired, OK - OK, ?? - revalidate

temp - temporary, perm - permanent

NA - Not Applicable None - Not defined

Host Port Flags Age Type Address(es)

Router1 None (perm, OK) 0 IP 192.168.1.1

192.168.3.1

172.16.0.1

1. Ingresamos por Telnet al router 2 desde la PC 1 y ejecutamos show users.

C:\>telnet 172.17.0.1

Trying 172.17.0.1 ...Open

User Access Verification

Password:

Router2>show users

Line User Host(s) Idle Location

\*134 vty 0 idle 00:00:00 172.16.0.3

Interface User Mode Idle Peer Address