

# Brief CISCO routers documentation

## 1 Connection and startup

1. Use the **minicom** tool in a terminal. You can exit using **Ctrl-a, then z then q**.
2. Connect to the router using an appropriate cable (DB9 (RJ45) console). The serial line parameters are 9600 (Baud) 8N1 (8 data bits, no parity, 1 stop bit) **Ctrl-a, z, p**
3. You are now connected to the IOS console interface, the prompt ends by the character : >.

The prompt tells you what command level you are at. For instance :

- initial mode : > ;
- admin mode : # ;
- configuration mode : **(config)** # ;
- interface configuration : **(config-if)** # .

you go back to the previous level by typing **exit**.

**At any time, type the character “?” to get the available commands** (ex : show?).  
Auto-completion is available with tab.

## 2 Configuration of the interfaces

- **enable** : allows to switch into admin mode (may be protected by a password – please do not specify a password, it's a pain to recover a router with a lost password).
- In enable mode (prompt : #)
  - **show interfaces** : you see the state of the router interfaces.
  - **configure terminal** : switches to config mode.
  - **write** : Saves the current configuration into startup-config (same as **copy running-config startup-config**)
  - **show running-config** See current configuration (still in RAM).
  - **show startup-config** See the file saved with **write**).
- In config mode (prompt : **(config)**#)
  - **interface <interface name> <number>** : allows to enter the interface configuration command level. Typical interface name is fast Ethernet  
Example : interface FastEthernet 0
- In interface config mode (prompt : **(config-if)**#)

- **ip address <adresse internet> <netmask>** : set the IP address and mask of an interface  
Example : ip address 192.168.0.1 255.255.255.0
- **no shutdown** : active l'interface

## 2.1 Configuration of the ports of the internal switch

The internal switch (ports 0 to 3 on the cisco 881) are all initially associated with the IP interface VLAN 1. You cannot specify an IP address to these interfaces. If you want another IP interface, create an additional VLAN.

Example :

**(config)# interface fastEthernet 0**

**(config-if)#switchport access vlan 2**

Associates interface 0 to VLAN 2 (and remove it from VLAN 1)

Then : **(config)#interface vlan 2**

**(config-if)#ip address 192.168.2.1 255.255.255.0**

### Port mirroring

To observe the traffic between two routers, you can interconnect them through the HP switch that sits on the table.

Use the following commands to observe the traffic on Eth 2 to 4 on Eth 1 : **(config)# mirror ethernet 1 !!** the traffic will be mirrored to Eth1

**(config)# interface eth 2-4**

**(config eth-2-4)# monitor**

## 3 Routing

- Routing table observation
  - **show ip route** (in config mode (prompt #)) :  
In the routing table, an "S" means that it is a static route, a "C" is a locally accessible network,  
0.0.0.0 is the default route  
Example : C 192.168.0.1/24 is directly connected Ethernet 0
- Activating RIP, OSPF, EIGRP, BGP ..
  - **router <routing proto>** : (prompt : (config)#). (followed by a process number for OSPF, and by the AS number for BGP.)
  - Then you are in the routing protocol configuration mode (config-router)\*#  
**network < network address>** needs to be specified for all the prefixes handled by the routing protocol.  
Example, launching RIP on 2 networks :  
**router rip**

- network 192.168.2.0**
- network 192.168.1.0**
- **no router <algo de routage>** : stops the corresponding routing protocol
- **ip route <net addr> <netmask> <next hop>**  
adds a static route.  
Example : **ip route 192.168.0.0 255.255.255.0 10.0.0.1**  
For a default route : 0.0.0.0 0.0.0.0
- **no ip route <address> <netmask>**  
removes a static route.

## 4 Divers

- to change the router name (appearing on the prompt) :  
in config mode : **hostname router\_name**
- To stop a traceroute or ping, press **control-shift-6**.
- To avoid endless DNS queries after a typo : **no ip domain-lookup**.

## 5 Saving and restoring a config

You may backup and restore the (**startup-config**)with TFTP to a machine accessible by the router.

1. Launch tftpd on the machine  
Uncomment the tftp lines in the `/etc/inetd.conf` file, so that the super-daemon `inetd` launches TFTP when a packet arrives on port 69.  
The `-s` option of `tftpd` allows to specify where all files will go. In general, we use `/tftpboot`. For `inetd` to take into account your changes in `/etc/inetd.conf`, send it the "HUP" signal : `killall -HUP inetd`. (You can also simply kill and restart `inetd`!)
2. Create a file in the `/tftpboot` directory.  
`tftpd` never creates a file, a file with a proper name needs to preexist. `chmod <file> 777` makes sure it can access it.
3. File transfers :
  - From router to computer :  
`ROUTER# copy nvram:/startup-config tftp`
  - From computer to router :  
`ROUTER# copy tftp nvram: then restart the router : reload`
4. Return to a blank configuration :  
`erase startup-config then reload`  
To the question "...initial configuration dialog?", say "no"!

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## 6 Using Zebra in FressBSD

Mode d'emploi :

- Starting zebra.  
You need a **zebra.conf** config file in **/usr/local/etc/quagga**. Simply copy **zebra.conf.sample**<sup>1</sup> into this directory.  
Start the zebra daemon : **zebra -d** You can access a prompt similar to the IOS config prompt : **telnet localhost zebra** (Yes, there is a zebra port number in `/etc/services`, when the package is installed). The password is **zebra** (as per the config file!).
- Starting a routing protocol.  
To use RIP, OSPF or BGP, start the corresponding daemons **in addition to zebra**. the daemons are called `ospfd`, `bgpd` et `ripd` and the config files `ospfd.conf`, `bgpd.conf`, `ripd.conf`.  
You can now `telnet localhost ospfd`.
- You may still have to activate the routing :  
`sysctl net.inet.ip.forwarding=1`
- Saving the config.  
Use the **write** command to update the **.conf** file.  
NB : the databases are in **/tmp/.zebra**. You can empty them after killing the daemons.

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1. Copié depuis `/usr/local/share/examples/quagga`