

Cisco router cheat sheets

0. standard minimal cisco setup

```
Router> enable

Router# configure terminal

Router(config)# enable secret class

Router(config)# hostname R1

Router(config)# exit

Router# copy running-config startup-config
Destination filename [startup-config]? <ENTER>
Building configuration...
[OK]
Router#reload
Proceed with reload? [confirm] <ENTER>

#####

Router> enable
Password: class

Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.

Router(config)# interface fastethernet 0/0
Router(config-if)# ip address 10.1.0.1 255.255.0.0
Router(config-if)# no shutdown
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
Router(config-if)# exit

Router(config)# interface serial 0/0/0
Router(config-if)# ip address 192.168.255.1 255.255.255.0
Router(config-if)# clock rate 64000
Router(config-if)# no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)# exit
```

1a. setting up cisco static routing

Syntax:

ip route [destination_network] [subnet_mask] [gateway_address]

Example:

```
hostname(config)# ip route 10.2.0.0 255.255.0.0 192.168.5.2
```

1b. setting up a default gateway

Syntax:

ip route 0.0.0.0 0.0.0.0 gateway_ip

Example:

```
hostname(config)# ip route 0.0.0.0 0.0.0.0 192.168.255.254
```

1c. routing met rip2

```
Router# conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)# router rip
```

```
Router(config-router)# version 2
```

```
Router(config-router)# network 10.1.0.0
```

```
Router(config-router)# network 192.168.255.0
```

```
Router(config-router)# exit
```

```
Router(config)#
```

In sommige gevallen (subnetten van mekaar gescheiden) is het noodzakelijk summarization te verhinderen:

```
Router(config-router)# no auto-summary
```

1d. routing met bgp4

```
Router# conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)# router bgp 100
```

```
Router(config-router)# bgp log-neighbor-changes
```

```
Router(config-router)# no synchronization
```

```
Router(config-router)# neighbor 172.16.1.2 remote-as 200
```

```
Router(config-router)# network 192.168.1.0
```

```
Router(config-router)# network 192.168.100.0
```

```
Router(config-router)# exit
```

```
Router(config)#
```

2a. setting up static NAT

```
Router(config)# interface Serial0/0/0
Router(config-if)# ip address 63.63.63.1 255.255.255.0
Router(config-if)# ip nat outside
Router(config-if)# exit
Router(config)# interface Ethernet0/0
Router(config-if)# ip address 10.1.1.1 255.255.255.0
Router(config-if)# ip nat inside
Router(config-if)# exit
Router(config)# ip nat inside source static tcp 10.1.1.2 80 interface
serial 0/0/0 80
(alles wat op de seriele interface binnenkomt op tcp poort 80 wordt doorgestuurd naar 10.1.1.2)
```

example ccna2 h5 in PT:

```
Router(config)# interface FastEthernet0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# ip nat inside
Router(config)# interface Serial0/0/0
Router(config-if)# ip address 209.165.200.225 255.255.255.224
Router(config-if)# clock rate 56000
Router(config-if)# ip nat outside
Router(config)# ip route 0.0.0.0 0.0.0.0 209.165.200.226
Router(config)# ip nat inside source static 192.168.1.10 209.165.200.227
(subnet /27 bevat router adres: 225; def gateway: 226 en server: 227, en nog 27 andere adressen)
```

2b. setting up dynamic NAT

```
R1# configure terminal
R1(config)# interface fastethernet0/0
R1(config-if)# ip nat inside
R1(config-if)# interface serial0/0
R1(config-if)# ip nat outside
R1(config-if)# exit
R1(config)# ip nat pool Public-IPS 200.2.2.2 200.2.2.5 prefix-length 29
R1(config)# ip nat inside source list 100 pool Public-IPS
R1(config)# access-list 100 remark == [Control NAT Pool Service]==
R1(config)# access-list 100 permit ip 192.168.0.0 0.0.0.255 any
R1# show ip nat translations
```

Pro	Inside global	Inside local	Outside local	Outside global
---	200.2.2.2	192.168.0.6	---	---
---	200.2.2.3	192.168.0.8	---	---

2c. setting up Port Address Translation (NAT overload)

```
R1# configure terminal
R1(config)# interface fastethernet0/0
R1(config-if)# ip nat inside
R1(config-if)# interface serial0/0
R1(config-if)# ip nat outside
R1(config-if)# exit
R1(config)# ip nat pool mypool 209.165.200.225 209.165.200.225 netmask
255.255.255.224
R1(config)# ip nat inside source list 1 pool mypool overload
R1(config)# access-list 1 remark == [Control NAT Service]==
R1(config)# access-list 1 permit 192.168.1.0 0.0.0.255
R1# show ip nat translations
```

Pro	Inside global	Inside local	Outside local	Outside global
udp	200.2.2.1:53427	192.168.0.6:53427	74.200.84.4:53	74.200.84.4:53
udp	200.2.2.1:53427	192.168.0.6:53427	195.170.0.1:53	195.170.0.1:53
tcp	200.2.2.1:53638	192.168.0.6:53638	64.233.189.99:80	64.233.189.99:80
tcp	200.2.2.1:57585	192.168.0.7:57585	69.65.106.48:110	69.65.106.48:110
tcp	200.2.2.1:57586	192.168.0.7:57586	69.65.106.48:110	69.65.106.48:110

3. setting up DHCP

```
Router> enable
Router# conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# ip dhcp pool cisco-dhcp
Router(dhcp-config)# network 10.255.0.0 255.255.0.0
Router(dhcp-config)# dns-server 10.255.0.8
Router(dhcp-config)# domain-name linux800.net
Router(dhcp-config)# default-router 10.255.0.1
Router(dhcp-config)# exit
Router(config)# ip dhcp excluded-address 10.255.0.1 10.255.0.200
Router# sh run
...
ip dhcp excluded-address 10.255.0.1 10.255.0.200
!
ip dhcp pool cisco-dhcp
 network 10.255.0.0 255.255.0.0
 default-router 10.255.0.1
 dns-server 10.255.0.8
!
...
```

4a. enable passwords and secrets on serial ports and vty

Setting the **enable secret** password:

```
Router(config)# enable secret ccna2
```

Setting the **console** password:

```
Router(config)# line con 0  
Router(config-line)# login  
Router(config-line)# password ccna
```

Setting the **auxiliary** port password:

```
Router(config)# line aux 0  
Router(config-line)# login  
Router(config-line)# password ccna
```

Setting the **Virtual Terminal (Telnet)** password:

```
Router(config)# line vty 0 15  
Router(config-line)# login  
Router(config-line)# password ccna
```

4b. enable SSH

```
Router(config)# hostname r1  
r1(config)# ip domain-name linux800.be  
r1(config)# crypto key generate rsa  
The name for the keys will be: r1.linux800.be  
Choose the size of the key modulus in the range of 360 to 2048 for your  
General Purpose Keys. Choosing a key modulus greater than 512  
may take a few minutes.  
How many bits in the modulus [512]: <enter>  
% Generating 512 bit RSA keys, keys will be non-exportable...[OK]  
  
r1(config)# user weareroot secret sdf1234567  
r1(config)# line vty 0 4  
*Mar 1 0:4:8.639: RSA key size needs to be at least 768 bits  
for ssh version 2  
*Mar 1 0:4:8.639: %SSH-5-ENABLED: SSH 1.5 has been enabled  
r1(config-line)# login local  
r1(config-line)# transport input ssh  
r1(config-line)# end
```

On the client host:

```
$ ssh -l weareroot 192.168.1.1  
Open  
Password: <sdf1234567>  
r1>
```

5a. copy/load router-config to/from tftp server

```
Router# copy startup-config tftp  
Address or name of remote host []? 192.168.3.10  
Destination filename [Router-config]? r1-20120504.1231
```

```
Writing startup-config....!!  
[OK - 643 bytes]
```

```
643 bytes copied in 3.038 secs (0 bytes/sec)
```

```
Router# copy tftp startup-config  
Address or name of remote host []? 192.168.3.10  
Source filename []? r1-20120504.1231  
Destination filename [startup-config]?
```

```
Accessing tftp://192.168.3.10/r1-20120504.1231...  
Loading r1-20120504.1231 from 192.168.3.10: !  
[OK - 643 bytes]  
643 bytes copied in 0.009 secs (71444 bytes/sec)
```

5b. copy/load router-config to/from ftp server

```
Router(config)# ip ftp username cisco  
Router(config)# ip ftp password cisco  
Router(config)# exit  
Router# copy run ftp  
Address or name of remote host []? 192.168.1.2  
Destination filename [Router-config]? <enter>  
Writing running-config...  
[OK - 577 bytes]  
577 bytes copied in 0.032 secs (18000 bytes/sec)  
Router#
```

6. erase a routers configuration completely

```
Router> enable  
Router# erase startup-config  
Erasing the nvram filesystem will remove all configuration  
files! Continue? [confirm] <enter>  
[OK]  
Erase of nvram: complete  
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram  
Router#
```

7. recover from an unknown or forgotten password

Tijdens het opstarten van de router onderbreken met <CTRL>+<BREAK>

Je krijgt dan de rommon prompt: **rommon 1>**

tik het volgende in:

```
rommon 1> confreg 0x2142  
rommon 1> reset  
Router> enable  
Router# copy start run  
Router# conf term  
Router(config)# enable secret class  
Router(config)# config-register 0x2102  
Router(config)# exit  
Router# copy run start  
Router# show version  
Router# reload
```

8. diverse commando's

set history size:

```
Router# terminal history size 50
```

remove dns lookup for wrongly entered commands:

```
Router(config)# no ip domain-lookup
```

banner:

```
Router(config)# line con 0  
Router(config-line)# banner motd # this is the motd #  
Router(config)# line con 0  
Router(config-line)# banner login # this is the login banner #  
Router(config-line)# password cisco  
Router(config-line)# login  
Router(config-line)# end
```

password encryption:

```
Router# sh run  
...  
line con 0  
  password cisco  
  login  
Router(config)# service password-encryption  
(this is not really safe - you can download reverse engineered software to hack this)  
Router# sh run  
...line con 0  
  password 7 0822455D0A16  
  login
```

status messages:

```
Router(config)# line con 0  
Router(config-line)# logging synchronous
```

encapsulation:

```
Router(config)# int ser 0/0/0  
Router(config-if)# ip address 10.1.1.1 255.255.255.252  
Router(config-if)# clock rate 4000000  
Router(config-if)# encapsulation ppp  
Router(config-if)# no shut
```

9. show commands

General Use:

```
show running-config
show startup-config
show version
```

Routing Related:

```
show ip protocols
show ip route
```

Interface Related:

```
show interfaces
show ip interface brief
show protocols
show controllers
```

Connectivity Related:

```
show cdp neighbors
show sessions
show ssh
```


Router# **show history**

```
show history
enable
show history
conf t
terminal history size 50
! dit is commentaar
```

Router# **show running-config**

```
Building configuration...

Current configuration : 625 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
interface FastEthernet0/0
 ip address 192.168.3.94 255.255.255.224
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 ip address 192.168.3.98 255.255.255.252
!
interface Serial0/0/1
 no ip address
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 version 2
 network 192.168.3.0
!
ip classless
!
line con 0
line vty 0 4
 login
!
end
```

Router# **show interfaces**

```
FastEthernet0/0 is up, line protocol is up (connected)
  Hardware is Lance, address is 0007.ec11.ba01 (bia 0007.ec11.ba01)
  Internet address is 192.168.3.94/27
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 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 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 21 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 input packets with dribble condition detected
    22 packets output, 1544 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out

FastEthernet0/1 is administratively down, line protocol is down (disabled)
  Hardware is Lance, address is 0007.ec11.ba02 (bia 0007.ec11.ba02)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 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 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 input packets with dribble condition detected
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 2 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out

Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 192.168.3.98/30
  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 15 bits/sec, 0 packets/sec
  5 minute output rate 15 bits/sec, 0 packets/sec
    21 packets input, 1092 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
    21 packets output, 1092 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions
  DCD=up DSR=up DTR=up RTS=up CTS=up

Serial0/0/1 is administratively down, line protocol is down (disabled)
  Hardware is HD64570
  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, 2 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions
  DCD=down DSR=down DTR=down RTS=down CTS=down
Vlan1 is administratively down, line protocol is down
Hardware is CPU Interface, address is 000a.f30c.9aea (bia 000a.f30c.9aea)
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

```

Router# **sh ip int brief**

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.3.94	YES	manual	up	up
FastEthernet0/1	unassigned	YES	unset	administratively down	down
Serial10/0/0	192.168.3.98	YES	manual	up	up
Serial10/0/1	unassigned	YES	unset	administratively down	down
Vlan1	unassigned	YES	unset	administratively down	down

Router# **show arp**

Protocol	Address	Age (min)	Hardware Addr	Type	Interface
Internet	192.168.3.94	-	0007.EC11.BA01		

Router# **show ip route**

Codes: C - connected, S - static, I - IGRP, 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

192.168.3.0/24 is variably subnetted, 3 subnets, 2 masks
R 192.168.3.0/27 [120/1] via 192.168.3.97, 00:00:16, Serial0/0/0
C 192.168.3.64/27 is directly connected, FastEthernet0/0
C 192.168.3.96/30 is directly connected, Serial0/

Router# **show protocols**

Global values:

Internet Protocol routing is enabled
FastEthernet0/0 is up, line protocol is up
Internet address is 192.168.3.94/27
FastEthernet0/1 is administratively down, line protocol is down
Serial0/0/0 is up, line protocol is up
Internet address is 192.168.3.98/30
Serial0/0/1 is administratively down, line protocol is down
Vlan1 is administratively down, line protocol is down

Router# **show version**

Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(15)T1, RELEASE SOFTWARE (fc2)

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

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Compiled Wed 18-Jul-07 04:52 by pt_team

ROM: System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)

System returned to ROM by power-on

System image file is "flash:c1841-advipservicesk9-mz.124-15.T1.bin"

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

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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 1841 (revision 5.0) with 114688K/16384K bytes of memory.

Processor board ID FTX0947Z18E

M860 processor: part number 0, mask 49

2 FastEthernet/IEEE 802.3 interface(s)

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

191K bytes of NVRAM.

63488K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102