# 实验三、路由器的基本配置

## 一、 实验目的

1. 掌握路由器配置前的准备
2. 掌握路由器的机器名的配置
3. 接口 IP 地址、基本封装类型

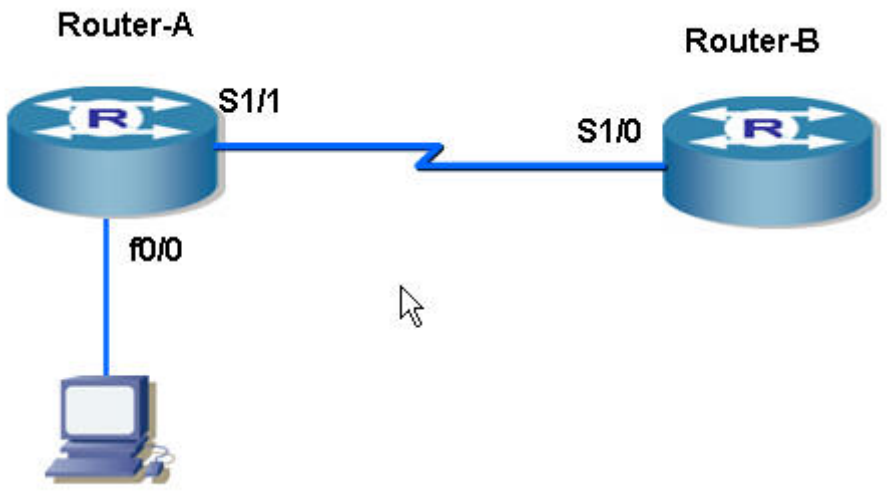
## 二、 应用环境

1. 在执行配置之前，本节学习的基本配置，是其他任务的基础。
2. 主要学习机器名、接口地址、特权模式密码等方法

## 三、 实验设备

1. DCR-1751 两台
2. CR-V35MT 一条
3. CR-V35FC 一条
4. 网线 两条

## 四、 实验拓扑




## 五、 实验要求

配置表

| Router-A | | | | Router-B | | |
|---|---|---|---|---|---|---|
| 接口 | 类型 | IP 地址 | | 接口 | 类型 | IP 地址 |
| S1/1 | DCE | 192.168.1.1 | | S0/0 | DTE | 192.168.1.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| F0/0 | | 192.168.2.1 | | | | |

## 六、 实验步骤

**路由器 A 的基本配置：**

**第一步：恢复出厂设置**

Router>**enable** ！进入特权模式

Router#2004-1-1 00:32:10 User DEFAULT enter privilege mode from console 0, level = 15

Router#**show running-config** ！查看当前配置

Building configuration...

Current configuration:

!

!version 1.3.2E

<省略>

Router#**delete** ！删除配置文件

this file will be erased,are you sure?(y/n)y

Router#**reboot** ！重新启动

Do you want to reboot the router(y/n)?y

Please wait…..

**第二步：设置接口 IP 地址、DCE 的时钟频率以及验证**

Router>**enable** ！进入特权模式

Router #**config** ！进入全局配置模式

Router _config#**hostname Router-A** ！修改机器名

Router-A_config#**interface s1/1** ！进入接口模式

Router-A_config_s1/0#**ip address 192.168.1.1 255.255.255.0** ！配置 IP 地址

Router-A_config_s1/0#**physical-layer speed 64000** ！配置 DCE 时钟频率

Router-A_config_s1/0#**no shutdown**

Router-A_config_s1/0#**^Z** ！按 **ctrl + z** 进入特权模式

Router-A#**show interface s1/1** ！查看接口状态

Serial1/0 is **up**, line protocol is **down** ！对端没有配置，所以协议是 **DOWN**

Mode=Sync **DCE** Speed=64000 ！查看 **DCE**

DTR=UP,DSR=UP,RTS=UP,CTS=DOWN,DCD=UP

Interface address is **192.168.1.1/24** ！查看 **IP** 地址

MTU 1500 bytes, BW 64 kbit, DLY 2000 usec

Encapsulation prototol **HDLC**, link check interval is 10 sec ！查看封装协议

Octets Received0, Octets Sent 0

Frames Received 0, Frames Sent 0, Link-check Frames Received0

Link-check Frames Sent 89, LoopBack times 0

Frames Discarded 0, Unknown Protocols Frames Received 0, Sent failuile 0

Link-check Timeout 0, Queue Error 0, Link Error 0,

60 second input rate 0 bits/sec, 0 packets/sec!

60 second output rate 0 bits/sec, 0 packets/sec!
0 packets input, 0 bytes, 8 unused_rx, 0 no buffer
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
8 packets output, 192 bytes, 0 unused_tx, 0 underruns
error:
0 clock, 0 grace
PowerQUICC SCC specific errors:
0 recv allocb mblk fail 0 recv no buffer
0 transmitter queue full 0 transmitter hwqueue_full

Router-A#**config**
Router-A_config#**interface f0/0**
Router-A_config_f0/0#**ip address 192.168.2.1 255.255.255.0**
Router-A_config_f0/0#**no shutdown**
Router-A_config_f0/0#**^Z**
Router-A#**show interface f0/0**
FastEthernet0/0 is **up**, line protocol is **up**
address is 00e0.0f18.1a70
Interface address is **192.168.2.1/24**
MTU 1500 bytes, BW 100000 kbit, DLY 10 usec
Encapsulation **ARPA**, loopback not set
Keepalive not set
ARP type: ARPA, ARP timeout 04:00:00
60 second input rate 0 bits/sec, 0 packets/sec!
60 second output rate 6 bits/sec, 0 packets/sec!
Full-duplex, 100Mb/s, 100BaseTX, 1 Interrupt
0 packets input, 0 bytes, 200 rx_freebuf
Received 0 unicasts, 0 lowmark, 0 ri, 0 throttles
0 input errors, 0 CRC, 0 framing, 0 overrun, 0 long
1 packets output, 46 bytes, 50 tx_freebd, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 babbles, 0 late collisions, 0 deferred, 0 err600
0 lost carrier, 0 no carrier 0 grace stop 0 bus error
0 output buffer failures, 0 output buffers swapped out

**第三步**：设置特权模式密码
Router-A_config#**enable password 0 digitalchina** **！0 表示明文**
Router-A_config#**^Z**
Router-A#2004-1-1 16:38:49 Configured from console 0 by DEFAULT

Router-A#**exit**
Router-A>**enable** **！再次进入特权模式**
Password: **！需要输入密码**
Access deny !

Router-A>enable
Password: ！注意输入时不显示
Router-A#2004-1-1 16:39:14 User DEFAULT enter privilege mode from console 0, level = 15

Router-A#

**第四步：保存**
Router-A#**write** ！保存配置
Saving current configuration...
OK!

**第五步：查看配置序列**
Router-A#**show running-config**
Building configuration...

Current configuration:
!
!version 1.3.2E
service timestamps log date
service timestamps debug date
no service password-encryption
!
**hostname Router-A** ！查看机器名
!
**enable password 0 digitalchina level 15** ！注意到密码可以显示
!
interface FastEthernet0/0
 ip address **192.168.2.1 255.255.255.0** ！查看 IP 地址
 no ip directed-broadcast
!
< 省略….>
interface Serial1/1
 ip address **192.168.1.1 255.255.255.0** ！查看 IP 地址
 no ip directed-broadcast
 physical-layer speed 64000
!
interface Async0/0
 no ip address
 no ip directed-broadcast
!
**路由器 B 的配置(命令解释参照路由器 A 的配置)**
**第一步：恢复出厂设置**
Router>**enable** ！进入特权模式

Router#2004-1-1 00:32:10 User DEFAULT enter privilege mode from console 0, level = 15

Router#**show running-config** ！查看当前配置
Building configuration...

Current configuration:
!
!version 1.3.2E
<省略>

Router#**delete** ！删除配置文件
this file will be erased,are you sure?(y/n)y
Router#**reboot** ！重新启动
Do you want to reboot the router(y/n)?y
Please wait…..

**第二步：设置 IP 地址及验证**
Router>**enable**
Router#2004-1-1 01:04:14 User DEFAULT enter privilege mode from console 0, level = 15

Router#**config**
Router_config#**hostname Router-B**
Router-B_config#**interface s1/0**
Router-B_config_s1/0#**ip address 192.168.1.2 255.255.255.0**
Router-B_config_s1/0#**no shutdown**
Router-B_config_s1/0#**^Z**
Router-B#**show interface s1/0**
Serial1/0 is **up**, line protocol is **up** ！此时接口和协议都是 **up** 状态
  Mode=Sync **DTE**
    DTR=UP,DSR=UP,RTS=DOWN,CTS=UP,DCD=UP
    Interface address is **192.168.1.2/24**
    MTU 1500 bytes, BW 64 kbit, DLY 2000 usec
    Encapsulation prototol **HDLC**, link check interval is 10 sec
Octets  Received0, Octets Sent 0
Frames Received 0, Frames Sent 0, Link-check Frames Received0
Link-check Frames Sent 391,  LoopBack times 0
Frames Discarded 0, Unknown Protocols Frames Received 0, Sent failuile 0
    Link-check Timeout 0, Queue Error 0, Link Error 0,
    60 second input rate 0 bits/sec, 0 packets/sec!
    60 second output rate 0 bits/sec, 0 packets/sec!
      0 packets input, 0 bytes, 8 unused_rx, 0 no buffer
      0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
      8 packets output, 192 bytes, 0 unused_tx, 0 underruns
    error:

0 clock, 0 grace
PowerQUICC SCC specific errors:
0 recv allocb mblk fail 0 recv no buffer
0 transmitter queue full 0 transmitter hwqueue_full

**第三步：保存**

Router-B#**write**
Saving current configuration...
OK!

**第四步：查看配置序列**

Router-B#**show running-config**
Building configuration...

Current configuration:
!
!version 1.3.2E
service timestamps log date
service timestamps debug date
no service password-encryption
!
hostname **Router-B**
!
interface FastEthernet0/0
ip address **192.168.3.1 255.255.255.0**
no ip directed-broadcast
!
interface Ethernet1/1
no ip address
no ip directed-broadcast
duplex half
!
interface Serial1/0
ip address **192.168.1.2 255.255.255.0**
no ip directed-broadcast
!
interface Async0/0
no ip address
no ip directed-broadcast
!
!
!
!
!
!

!

**第五步**：测试连通性

Router-B#**ping 192.168.1.1** **！PING Router-A 的地址**

PING 192.168.1.1 (192.168.1.1): 56 data bytes

!!!!!

--- 192.168.1.1 ping statistics ---

5 packets transmitted, 5 packets received, 0% packet loss

round-trip min/avg/max = 20/22/30 ms

## 七、 注意事项和排错

1. CR-V35FC 所连的接口为 DCE，需要配置时钟频率，CR-V35MT 所连的接口为 DTE。
2. 查看接口状态，如果接口是 DOWN，通常是线缆故障；如果协议是 DOWN，通常是时钟频率没有配，或者是两端封装协议不一致（封装的实验参看实验四）

## 八、 配置序列

在步骤中已经列出

## 九、 共同思考

1. 如果要将特权模式密码用密文显示，用什么参数？（请用？查看）
2. 如果在插槽 2 上的第 2 个快速以太网接口怎么表示？（f1/1）

## 十、 课后练习

请将所有地址改为 10.0.0.0/24 这个网段，重复以上配置。

## 十一、 相关命令详解。

# show interface

使用 show interface 全局配置命令配置接口状态。

**show interface**

**show interface type** interface-number

**show interface type** *slot/port* （用于带有非信道化 E1 的物理接口的路由器）

**show interface serial** *slot/port*:*channel-group*（用于显示非信道化 E1 的物理接口）

**show interface serial** *slot/port.subinterface-number*（用于显示子接口）

**参数**

| 参数 | 参数说明 |
|---|---|
| **type** | 指定要配置的接口类型。 |

| | |
|---|---|
| *interface-number* | 逻辑接口序号。 |
| *slot* | 插槽或插卡编号。 |
| *port* | 插槽或插卡端口编号。 |
| *channel-group* | 范围为0-30的E1信道组号，使用channel-group配置命令定义。 |
| *subinterface-number* | 范围为1-32767的子接口号。 |

### 缺省

无

### 命令模式

管理态

### 使用说明

若 show interface 命令后面不带任何参数，则显示所有接口的信息

**路由器 C 的基本配置(命令解释参照路由器 A 的配置)**

**第一步：恢复出厂设置**

Router>**enable** **！进入特权模式**

Router#2004-1-1 00:32:10 User DEFAULT enter privilege mode from console 0, level = 15

Router#**show running-config** **！查看当前配置**

Building configuration...

Current configuration:

!

!version 1.3.2E

<省略>

Router#**delete** **！删除配置文件**

this file will be erased,are you sure?(y/n)y

Router#**reboot** **！重新启动**

Do you want to reboot the router(y/n)?y

Please wait…..

**第二步：设置 IP 地址及验证**

Router#**config**

Router_config#**hostname Router-C**

Router-C_config#**interface f0/0**

Router-C_config_f0/0#**ip address 192.168.2.2 255.255.255.0**

Router-C_config_f0/0#**no shutdown**

Router-C_config_f0/0#**interface e1/0**

Router-C_config_e1/0#**ip address 192.168.3.2 255.255.255.0**

Router-C_config_e1/0#**no shutdown**

Router-C_config_e1/0#**^Z**

Router-C#**show interface**

FastEthernet0/0 is **up**, line protocol is **up**

address is 00e0.0f20.0368

Interface address is **192.168.2.2/24**

MTU 1500 bytes, BW 100000 kbit, DLY 10 usec

Encapsulation **ARPA,** loopback not set

Keepalive not set

ARP type: ARPA, ARP timeout 04:00:00

60 second input rate 0 bits/sec, 0 packets/sec!

60 second output rate 0 bits/sec, 0 packets/sec!

Full-duplex, 100Mb/s, 100BaseTX, 1 Interrupt

0 packets input, 0 bytes, 200 rx_freebuf

Received 0 unicasts, 0 lowmark, 0 ri, 0 throttles

0 input errors, 0 CRC, 0 framing, 0 overrun, 0 long

1 packets output, 46 bytes, 50 tx_freebd, 0 underruns

0 output errors, 0 collisions, 0 interface resets
0 babbles, 0 late collisions, 0 deferred, 0 err600
0 lost carrier, 0 no carrier 0 grace stop 0 bus error
0 output buffer failures, 0 output buffers swapped out
Ethernet1/0 is **up**, line protocol is **up**
address is 00e0.0f20.0369
Interface address is **192.168.3.2/24**
MTU 1500 bytes, BW 10000 kbit, DLY 100 usec
Encapsulation **ARPA**, loopback not set
Keepalive not set
ARP type: ARPA, ARP timeout 04:00:00
60 second input rate 0 bits/sec, 0 packets/sec!
60 second output rate 0 bits/sec, 0 packets/sec!
Half-duplex, 10Mb/s, 10BaseTX, 0 Interrupt
0 packets input, 0 bytes, 100 rx_freebuf
Received 0 unicasts, 0 lowmark, 0 ri, 0 rx_busy
0 input errors, 0 CRC, 0 framing, 0 overrun
0 long, 0 i_collisions, 0 discard, 0 no buffer
0 packets output, 0 bytes, 50 tx_freebd, 0 underruns
0 output errors, 0 o_collisions, 0 late collisions
0 lost carrier, 0 output buffer failures
Async0/0 is down, line protocol is down
Hardware is Aux(PC16x50) Mode=Async Speed=9600
DTR=UP,DSR=DOWN,RTS=UP,CTS=DOWN,DCD=DOWN
MTU 1500 bytes, BW 9 kbit, DLY 10000 usec
Encapsulation PPP, loopback not set
Keepalive set(10 sec)
LCP Listening -- waiting for remote host to attempt open
60 second input rate 0 bits/sec, 0 packets/sec!
60 second output rate 0 bits/sec, 0 packets/sec!
pc16x50 UART 0, 5417 Interrupt
0 packets input, 0 bytes, 0 no buffer
0 input errors, 0 rx_dump, 0 Parity, 0 frame, 0 overrun
0 packets output, 0 bytes, 0 underruns
aux 0 output queue full, 0 frame has mblk more than one
flow control mode: hardware

**第三步：保存**

Router-C#**write**
Saving current configuration...
OK!

**第四步：查看配置序列**

Router-C#**show running-config**
Building configuration...

```
Current configuration:
!
!version 1.3.1S
service timestamps log date
service timestamps debug date
no service password-encryption
!
hostname Router-C
!
interface FastEthernet0/0
 ip address 192.168.2.2 255.255.255.0
 no ip directed-broadcast
!
interface Ethernet1/0
 ip address 192.168.3.2 255.255.255.0
 no ip directed-broadcast
 duplex half
!
interface Async0/0
 no ip address
 no ip directed-broadcast
!
!
gateway-cfg
 Gateway keepAlive 60
 shutdown
!
!
ivr-cfg
!
Router-C#
```