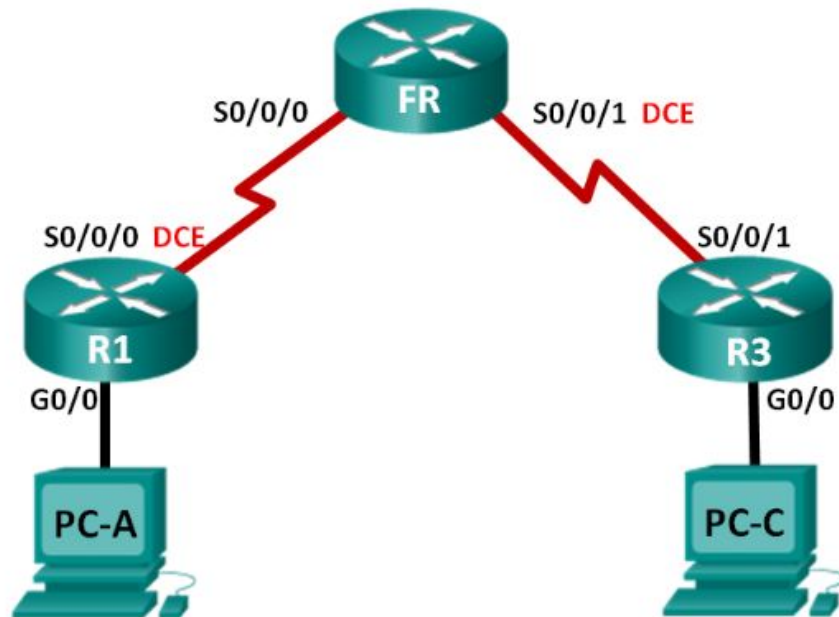# Конфигурирование Frame Relay на маршрутизаторах и команды для отладки сети

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Топология сети

Настройка коммутатора Frame Relay

FR(config)# **frame-relay switching**

FR(config)# **interface s0/0/0**

FR(config-if)# **encapsulation frame-relay**

FR(config)# **interface s0/0/0**

FR(config-if)# **frame-relay intf-type dce**

FR(config-if)# **frame-relay route 103 interface s0/0/1 301**

FR(config-if)# **no shutdown**

FR(config)# **interface s0/0/1**

FR(config-if)# **encapsulation frame-relay**

FR(config-if)# **frame-relay intf-type dce**

FR(config-if)# **frame-relay route 301 interface s0/0/0 103**

FR(config-if)# **no shutdown**

Проверка настройки Frame Relay

```
FR# show frame-relay pvc

PVC Statistics for interface Serial0/0/0 (Frame Relay DCE)

            Active      Inactive     Deleted      Static
Local         0            0            0            0
Switched      0            1            0            0
Unused        0            0            0            0

DLCI = 103, DLCI USAGE = SWITCHED, PVC STATUS = INACTIVE, INTERFACE = Serial0/0/0

input pkts 0            output pkts 0          in bytes 0
out bytes 0            dropped pkts 0         in pkts dropped 0
out pkts dropped 0            out bytes dropped 0
in FECN pkts 0        in BECN pkts 0         out FECN pkts 0
out BECN pkts 0       in DE pkts 0           out DE pkts 0
out bcast pkts 0      out bcast bytes 0
30 second input rate 0 bits/sec, 0 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
switched pkts 0
Detailed packet drop counters:
no out intf 0         out intf down 0        no out PVC 0
in PVC down 0         out PVC down 0         pkt too big 0
shaping Q full 0      pkt above DE 0         policing drop 0
connected to interface Serial0/0/1 301
pvc create time 00:00:53, last time pvc status changed 00:00:53

PVC Statistics for interface Serial0/0/1 (Frame Relay DCE)

            Active      Inactive     Deleted      Static
Local         0            0            0            0
Switched      0            1            0            0
Unused        0            0            0            0

DLCI = 301, DLCI USAGE = SWITCHED, PVC STATUS = INACTIVE, INTERFACE = Serial0/0/1

input pkts 0            output pkts 0          in bytes 0
out bytes 0            dropped pkts 0         in pkts dropped 0
out pkts dropped 0            out bytes dropped 0
in FECN pkts 0        in BECN pkts 0         out FECN pkts 0
out BECN pkts 0       in DE pkts 0           out DE pkts 0
out bcast pkts 0      out bcast bytes 0
```

Проверка настройки Frame Relay

```
30 second input rate 0 bits/sec, 0 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
switched pkts 0
Detailed packet drop counters:
no out intf 0            out intf down 0          no out PVC 0
in PVC down 0            out PVC down 0           pkt too big 0
shaping Q full 0         pkt above DE 0           policing drop 0
connected to interface Serial0/0/0 103
pvc create time 00:00:16, last time pvc status changed 00:00:16
```

Проверка настройки Frame Relay

```
FR# show frame-relay route
Input Intf        Input Dlci        Output Intf       Output Dlci       Status
Serial0/0/0       103               Serial0/0/1       301               inactive
Serial0/0/1       301               Serial0/0/0       103               inactive
```

Настройка маршрутизатора

R3(config)# **interface s0/0/1**

R3(config-if)# **encapsulation frame-relay**

R3(config-if)# **no frame-relay inverse-arp**

R3(config-if)# **frame-relay map ip 10.1.1.1 301 broadcast**

R3(config-if)# **frame-relay map ipv6 2001:db8:acad:b::1 301**

R3(config-if)# **frame-relay map ipv6 fe80::1 301 broadcast**

R3(config-if)# **frame-relay map ip 10.1.1.2 301**

R3(config-if)# **frame-relay map ipv6 2001:db8:acad:b::3 301**

R3(config-if)# **no shutdown**

Убедимся, что протокол Frame Relay активен

```
R1# ping 10.1.1.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/40 ms
R1# ping 2001:db8:acad:b::3
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:ACAD:B::3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/28 ms
```

Убедимся, что протокол Frame Relay активен

```
R1# show frame-relay pvc

PVC Statistics for interface Serial0/0/0 (Frame Relay DTE)

                Active      Inactive      Deleted      Static
Local             1             0            0            0
Switched          0             0            0            0
Unused            0             0            0            0

DLCI = 103, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0/0/0

  input pkts 22            output pkts 154        in bytes 2240
  out bytes 10860          dropped pkts 0         in pkts dropped 0
  out pkts dropped 0             out bytes dropped 0
  in FECN pkts 0           in BECN pkts 0         out FECN pkts 0
  out BECN pkts 0          in DE pkts 0           out DE pkts 0
  out bcast pkts 134       out bcast bytes 8780
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
  pvc create time 01:59:40, last time pvc status changed 01:55:14
```

Убедимся, что протокол Frame Relay активен

```
FR# show frame-relay route
Input Intf        Input Dlci     Output Intf      Output Dlci    Status
Serial0/0/0       103            Serial0/0/1      301            active
Serial0/0/1       301            Serial0/0/0      103            active
```

Убедимся, что протокол Frame Relay активен

```
R1# show frame-relay map
Serial0/0/0 (up): ipv6 FE80::3 dlci 103(0x67,0x1870), static,
                  broadcast,
                  CISCO, status defined, active
Serial0/0/0 (up): ipv6 2001:DB8:ACAD:B::1 dlci 103(0x67,0x1870), static,
                  CISCO, status defined, active
Serial0/0/0 (up): ip 10.1.1.1 dlci 103(0x67,0x1870), static,
                  CISCO, status defined, active
Serial0/0/0 (up): ipv6 2001:DB8:ACAD:B::3 dlci 103(0x67,0x1870), static,
                  CISCO, status defined, active
Serial0/0/0 (up): ip 10.1.1.2 dlci 103(0x67,0x1870), static,
                  broadcast,
                  CISCO, status defined, active
```

Отладка Frame Relay

```
R1# debug frame-relay lmi
Frame Relay LMI debugging is on
Displaying all Frame Relay LMI data
R1#
*Jun 26 18:28:45.922: Serial0/0/0(out): StEnq, myseq 50, yourseen 49, DTE up
*Jun 26 18:28:45.922: datagramstart = 0xC318D54, datagramsize = 13
*Jun 26 18:28:45.922: FR encap = 0xFCF10309
*Jun 26 18:28:45.922: 00 75 01 01 01 03 02 32 31
*Jun 26 18:28:45.922:
*Jun 26 18:28:45.922: Serial0/0/0(in): Status, myseq 50, pak size 13
*Jun 26 18:28:45.922: RT IE 1, length 1, type 1
*Jun 26 18:28:45.922: KA IE 3, length 2, yourseq 50, myseq 50
*Jun 26 18:28:45.922: PVC IE 0x7 , length 0x6 , dlci 103 , status 0x2 , bw 0
```