Secure Inter-Branch Connectivity Using Cisco Packet Tracer

Objective

To establish a secure and functional inter-branch network connection between two remote offices (Ghana and Cape Verde) using Cisco Packet Tracer, including:
- IP addressing
- Router and switch configuration
- PC setup
- Static routing
- Successful ping tests
- Access Control Lists (ACLs) for security
- Logging denied traffic

1. Network Devices Used

Routers:
- Router-Ghana
- Router-CapeVerde

Switches:
- Switch-Ghana
- Switch-CapeVerde

End Devices:
- PC-G1, PC-G2, PC-G3, PC-G4 (Ghana)
- PC-C1, PC-C2, PC-C3, PC-C4 (Cape Verde)

2. Router-to-Router Connection

Interface used: Serial0/1/0
Connection Type:
- Router-Ghana: DCE
- Router-CapeVerde: DTE

Clock rate set on DCE side (Ghana): clock rate 64000

3. Router and Interface Configuration

Router-Ghana Configuration:

```
interface GigabitEthernet0/1
ip address 192.168.10.1 255.255.255.0
no shutdown

interface Serial0/1/0
ip address 10.0.0.1 255.255.255.252
clock rate 64000
no shutdown
```

Router-CapeVerde Configuration:

```
interface GigabitEthernet0/1
ip address 192.168.20.1 255.255.255.0
no shutdown

interface Serial0/1/0
ip address 10.0.0.2 255.255.255.252
no shutdown
```

4. PC Configuration

Ghana Side:
- PC-G1: 192.168.10.2 / 255.255.255.0 | Gateway: 192.168.10.1
- PC-G2: 192.168.10.3 / 255.255.255.0 | Gateway: 192.168.10.1
- PC-G2: 192.168.10.4 / 255.255.255.0 | Gateway: 192.168.10.1
- PC-G2: 192.168.10.5 / 255.255.255.0 | Gateway: 192.168.10.1

Cape Verde Side:
- PC-C1: 192.168.20.2 / 255.255.255.0 | Gateway: 192.168.20.1
- PC-C2: 192.168.20.3 / 255.255.255.0 | Gateway: 192.168.20.1
- PC-C2: 192.168.20.4 / 255.255.255.0 | Gateway: 192.168.20.1
- PC-C2: 192.168.20.5 / 255.255.255.0 | Gateway: 192.168.20.1

5. Static Routing Configuration

Router-Ghana:

```
ip route 192.168.20.0 255.255.255.0 10.0.0.2
```

Router-CapeVerde:

```
ip route 192.168.10.0 255.255.255.0 10.0.0.1
```

6. Access Control List (ACL) Configuration

Router-Ghana (ACL 10):

```
access-list 10 permit 192.168.10.2 0.0.0.0
access-list 10 deny any log

interface Serial0/1/0
ip access-group 10 out
```

Router-CapeVerde (ACL 11):

```
access-list 11 permit 192.168.20.3 0.0.0.0
access-list 11 deny any log

interface Serial0/1/0
ip access-group 11 in
```

7. Verification & Testing

Successful:
- PC-G1 → PC-C2: Success
- PC-G2 → PC-C2: Blocked

- Serial connectivity (ping between routers): Success