Chương 9
Switch

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Nội Dung

- Qui trình xử lý gói tin của Switch
- Thiết kế mạng LAN
- Cấu hình Switch

Nội Dung

- **Qui trình xử lý gói tin của Switch**
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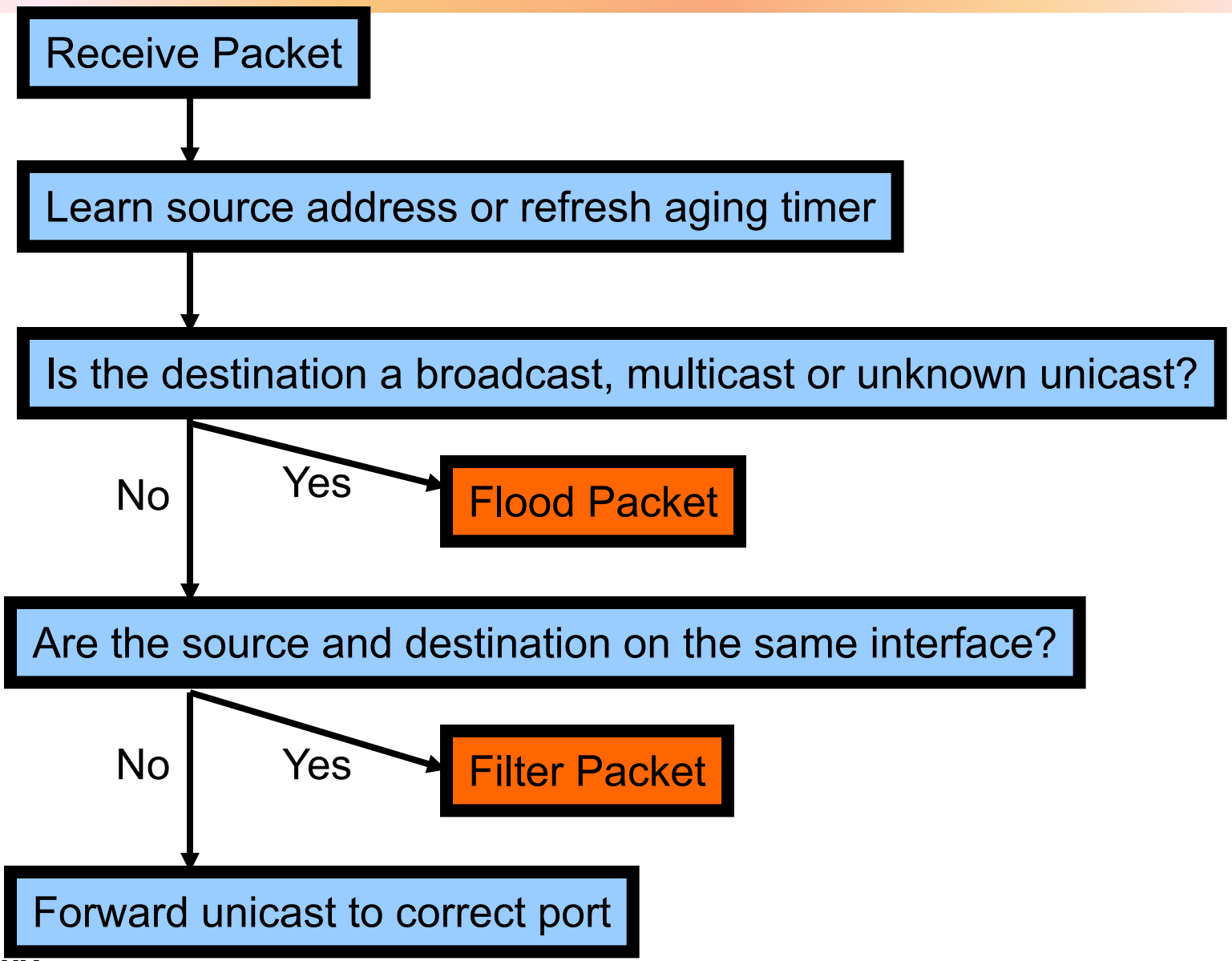
Qui trình xử lý gói tin của Switch



Qui trình xử lý gói tin của Switch

- Qui trình xử lý Frame của Switch. Khi nhận Frame, Switch sẽ thực hiện 2 thao tác cơ bản :
  - **Learning** (thêm mới hay cập nhật) : **kiểm tra Source MAC Address**
    - Nếu Source MAC Address có trong bảng Source Address Table thì sẽ cập nhật Timer
    - Ngược lại sẽ thêm vào Source Address Table 1 entry : Source MAC Address và Port tương ứng
  - **Forwarding** (Filter hay Flood) : **kiểm tra Destination MAC Address**
    - Nếu Destination MAC Address có trong bảng Source Address Table thì Switch sẽ chuyển tiếp gói tin tới đúng port cần nhận
    - Ngược lại, Switch sẽ gởi frame ra tất cả các port

Nội Dung

- Qui trình xử lý gói tin của Switch
- **Thiết kế mạng LAN**
- Cấu hình Switch

Thiết kế mạng LAN

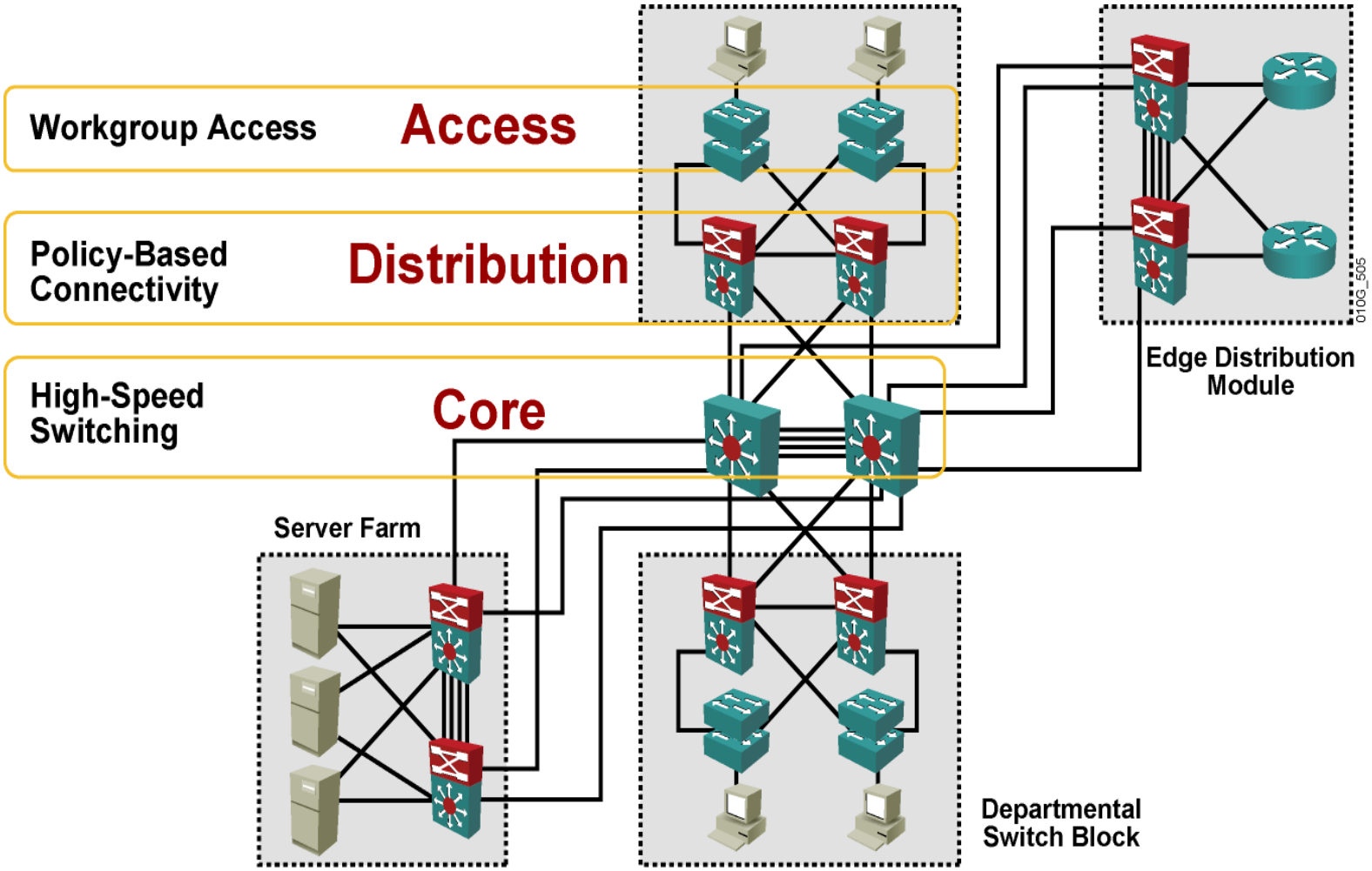
- Mục đích để thiết kế mạng LAN :

Network design requirements:

- Functionality
- Scalability
- Adaptability
- Manageability

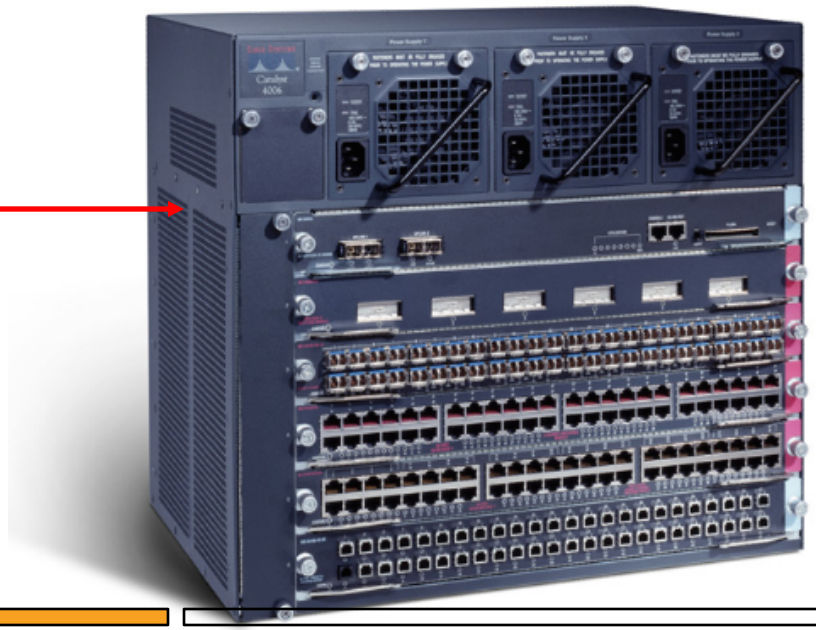
Thiết kế mạng LAN

- Thiết kế mạng theo mô hình phân cấp :

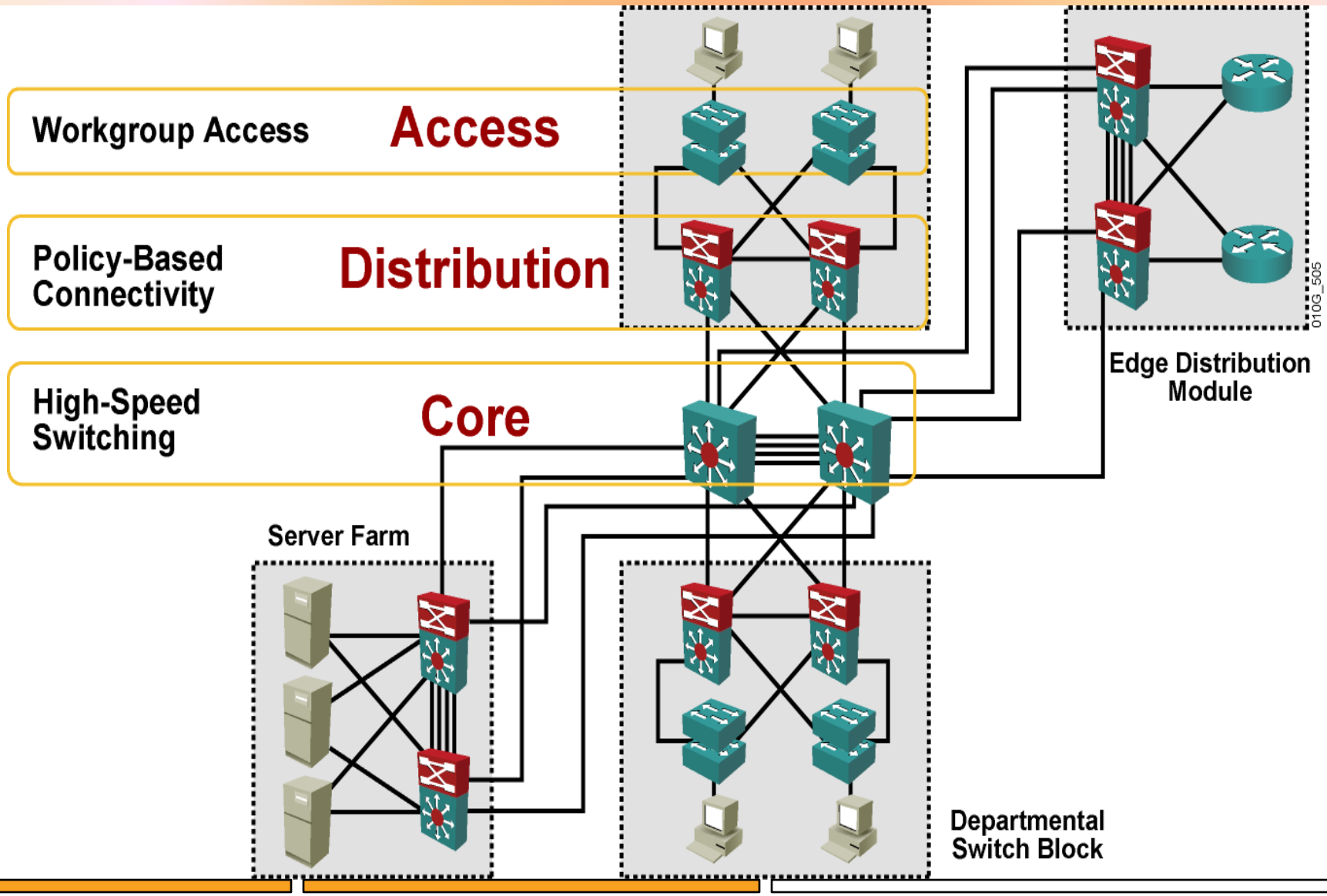


Access layer switches

- Hoạt động Layer 2
- Mục đích của Access Switch là cung cấp khả năng truy cập vào mạng của Người Dùng
  - Catalyst 1900 series
  - Catalyst 2820 series
  - Catalyst 2950 series
  - Catalyst 4000 series
  - Catalyst 5000 series



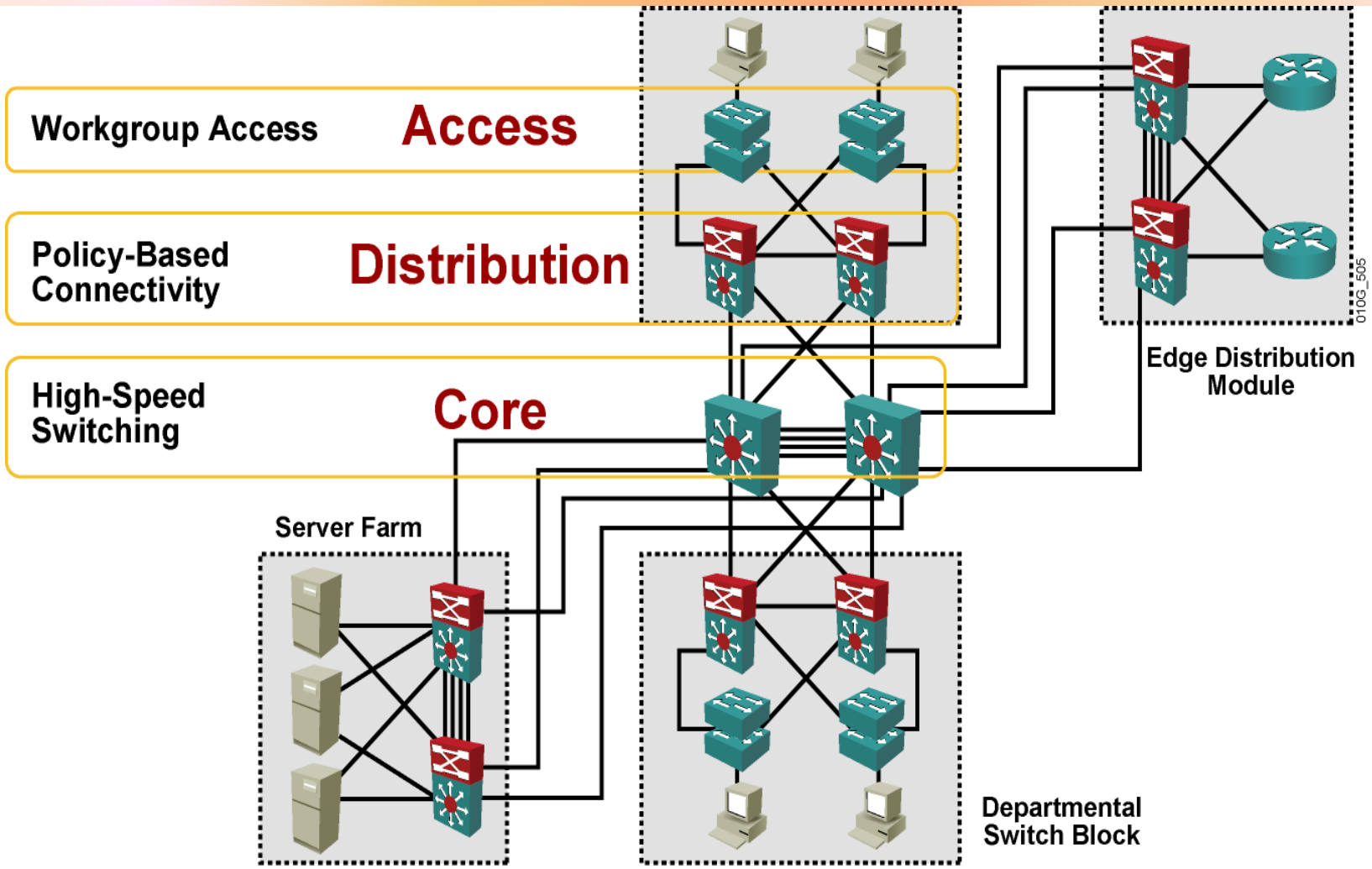
Distribution Layer



Distribution Layer

- Hoạt động ở Layer 2 và Layer 3
- Thiết lập những chính sách để lọc frame
- Những tính năng chính :
  - Chia Collison Domain và Broadcast Domain
  - VLAN
  - Security
  - ……..

Core Layer

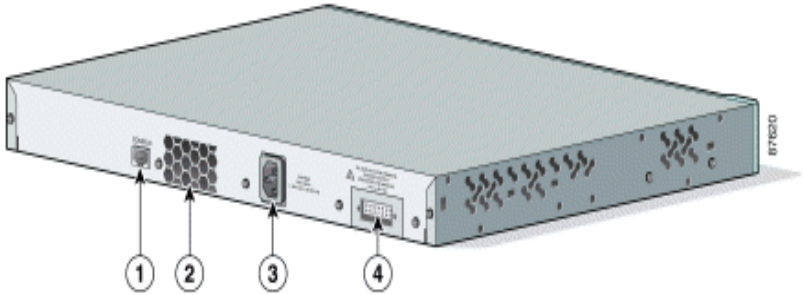

Workgroup Access
Access
Policy-Based Connectivity
Distribution
High-Speed Switching
Core
Server Farm
Edge Distribution Module
Departmental Switch Block
010G_505

Nội Dung

- Qui trình xử lý gói tin của Switch
- Thiết kế mạng LAN
- **Cấu hình Switch**

Thành phần vật lý của Switch

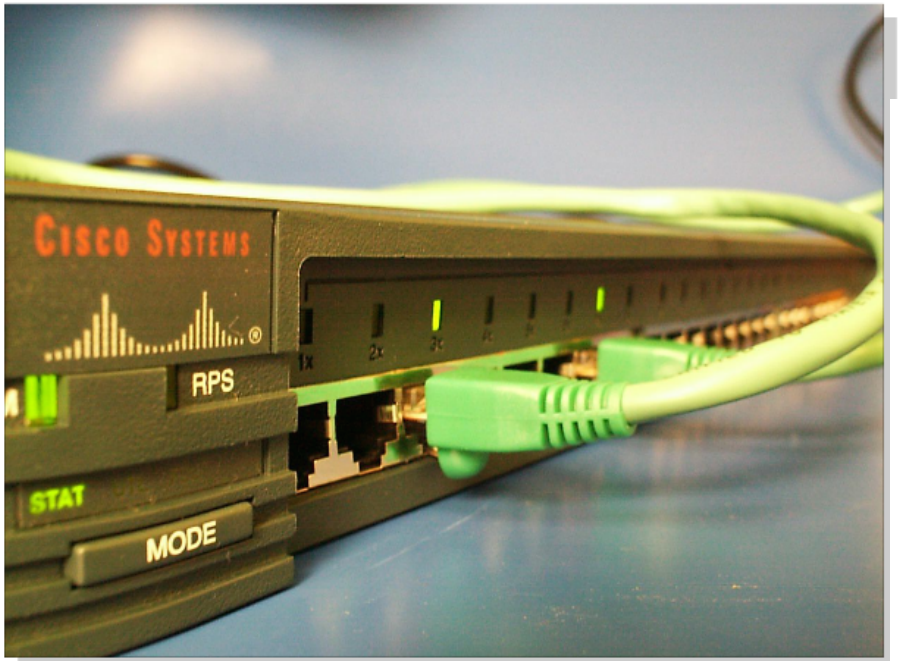
Figure 2-3 Catalyst 2970 Switch Rear Panel

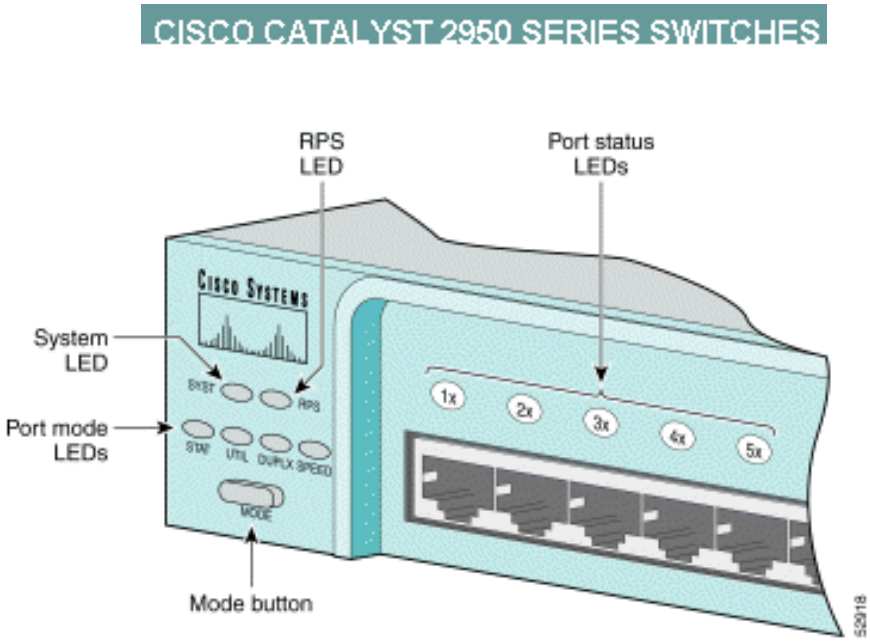


1	RJ-45 console port
2	Fan exhaust
3	AC power connector
4	RPS connector

- Switch giống như máy tính đặc biệt :
  - Central Processing Unit (CPU)
  - Random Access Memory (RAM)
  - Operating System
- Switch có thể được kết nối quản lý bằng cổng console

Switch LED indicators





- LED indicators : cho biết trạng thái của Switch

Switch LED indicators

Mode LED	Color	Description
STAT	Off	No link
	Solid Green	Link operational
	Flashing Green	Port is sending or receiving data
	Alternating green/amber	Link fault
	Solid amber	Port is not forwarding because it was disabled by management or address violation, or blocked by Spanning/Tree Protocol.
UTL	Off	Each LED that is off indicates a reduction by half of the total bandwidth. The LEDs are turned off from right to left. If the right-most LED is off, then the switch is using less than 50% of total bandwidth. If the two right-most LEDs are off, the switch is using less than 25% of total bandwidth.
	Green	If all LEDs are green, the switch is using 50% or more of total bandwidth.
FDUP	Off	Port is operating in half-duplex mode.
	Green	Port is operating in full-duplex mode.
100	Off	Port is operating at 10 Mbps.
	Green	Port is operating at 100 Mbps.

Examining help in the switch CLI

Cisco

```
Switch>?

Exec commands:

access-enable    Create a temporary Access-List entry

clear            Reset functions

connect          Open a terminal connection

disable          Turn off privileged commands

disconnect       Disconnect an existing network
                 connection

enable           Turn on privileged commands
```

show running-config

```
ALSwitch#show running-config
Building configuration...

Current configuration : 1300 bytes
!
version 12.1
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname ALSwitch
!
!
ip subnet-zero
!
!
spanning-tree mode pvst
no spanning-tree optimize bpdu transmission
spanning-tree extend system-id
!
!
!
!
interface FastEthernet0/1
```

show interface

```
Switch#show interface FastEthernet0/1
FastEthernet0/1 is down, line protocol is down
  Hardware is Fast Ethernet, address is
0008.e32e.e501 (bia 0008.e32.e.e601)
  MTU 1500 bytes, BW 0 Kbit, DLY 100 usec,
    reliability 255/25, txlead 1/255, rxlead 1/255
  Encapulation ARPA, Loopback not set
  Keepalive not set
  Auto-duplex, AutoSpeed , 100BaseTX/TX
  ARP type: ARPA, ARP TImeout 04:00:00
  Last Input never, output 00:31:54, output hang
never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue o/75, 0
drops
  5 minute input rate 0 bits/sec, 0 packets/sec
```

show vlan

```
Switch#show vlan
VLAN Name                Status  Ports
---- ------------------- ------  -------------------------
1    default             active  Fa0/1, Fa0/2, Fa0/3, Fa0/4,
                                 Fa0/5, Fa0/6, Fa0/7, Fa0/8,
                                 Fa0/9, Fa0/10,Fa0/11,Fa0/12
1002 fddi-default        active
1003 token-ring-default  active
1004 fddinet-default     active
1005 trnet-default       active

VLAN Type  SAID    MTU   Parent RingNo BridgeNo
---- ----- ------  ----- ------ ------ --------
1    enet  100001  1500  -      -      -
1002 fddi  101002  1500  -      -      -
1003 tr    101003  1500  1005   0      -
1004 fdnet 101004  1500  -      -      1
```

show flash

```
Switch#show flash or Switch#dir flash:
Directory of flash:/

  2  -rwx     1674921   Apr 30 2001 15:09:51  c2950-
c3h2s-mz.120-5.3.WC.1.bin
  3  -rwx         269   Jan 01 1970 00:00:57
env_vars
  4  drwx       10240   Apr 30 2001 15:09:52  html

7741440 bytes total (4780544 bytes free)
```

show version

```
Switch#show version
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-C3H2S-M), Version
12.0(5.3)WC(1), MAINTENANCE INTERIM SOFTWARE
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Mon 30-Apr-01 07:56 by devgoyal
Image text-base: 0x80010000, data-base: 0x8031A000

ROM: Bootstrap program is CALHOUN boot loader

Switch uptime is 1 hour, 24 minutes
System returned to ROM by power-on
System image file is "flash:c2950-c3h2s-mz.120-
5.3.WC.1.bin"
cisco WS-C2950-12 (RC32300) processor (revision B0) with
22260K bytes of memory.
Processor board ID FOC0605W0BH
```

Reset all Switch Configurations & Reload

Catalyst 2950

```
Switch#delete flash:vlan.dat
Delete filename [vlan.dat]?
Delete flash:vlan.dat? [confirm]
Switch#erase startup-config
<output omitted>
Switch#reload
```

Catalyst 1900

```
Switch#delete nvram
```

Set IP Address and Default Gateway

```
ALSwitch(config)#interface VLAN1
ALSwitch(config-if)#ip address 192.168.1.2
255.255.255.0
ALSwitch(config)#ip default-gateway 192.168.1.1
```

Catalyst 1900

```
ALSwitch(config)#ip address 192.168.1.2
255.255.255.0
ALSwitch(config)#ip default-gateway 192.168.1.1
```

Set Port Speed and Duplex Settings

```
Switch(config)#interface FastEthernet0/2
Switch(config-if)#duplex full
Switch(config-if)#speed 100
```