



DES-6300

Photo shows DES-6300 Chassis Switch with the following modules installed (from top down): DES-6302 management module, DES-6303 10/100Mbps RJ-45 port module, DES-6305 Fast Ethernet fiber port module, DES-6306 1000BASE-SX Gigabit port module, DES-6307 1000BASE-LX Gigabit port module, DES-6308 Gigabit copper port module, DES-6309 GBIC Gigabit port module, and 2 DES-6310 universal redundant power supplies.

## Multi-layer Chassis Switch

The DES-6300 is a multi-layer routing chassis switch that combines packet switching with wire-speed routing, multiple link aggregation and quality of service (QoS). Designed to give everything a business needs for today's switched networks, this 7-slot chassis offers high-speed performance, flexible twisted-pair and fiber cabling, edge device simplicity, modularized configuration and ideal price/performance ratio for departmental, backbone and campus connection in diversified network environments.

### Wire-speed IP Packet Routing

Using standard-based routing, the DES-6300 provides instant support for Windows, NetWare, Unix, AppleTalk and Internet environments. Built-in wire-speed non-blocking switch fabric provides hardware-based packet filtering/forwarding. Packet routing is performed by on-board ASICs, which is many times faster than traditional CPU-based routers.

### Seamless Integration

The DES-6300 can be instantly integrated into any existing network for seamless integration of multi-layer packet switching. With multi-layer support for every port, you can flexibly segment the network into domains and sub-domains, using (1) subnet, user and server IDs to route traffic, and (2) custom filters based on users' physical MAC addresses to filter extraneous traffic. At Layer 2, the switch uses auto-learned and user-defined MAC addresses to discard and forward packets. At higher layers, it looks at the routing table to route packets to their destinations.

### Scalable Port Density

With a modularized design and a wide range of port selection from Ethernet/Fast Ethernet to twisted-pair and fiber Gigabit, this switch provides for easy, scalable expansion. Bandwidth migration is simple with 10/100/1000Mbps multi-speed support and module hot swapping capability. This architecture provides for great flexibility and investment protection.

### Up to 96 Fast Ethernet or 12 Gigabit Ports

You can configure the switch with up to 96 10/100Mbps Fast Ethernet ports, 72 100Mbps fiber ports, 12 Gigabit ports, or a combination of these. Copper and fiber Gigabit ports (SX, LX and GBIC included) are provided. This flexible configuration allows you to install Fast Ethernet for workstation connections, copper Gigabit for departmental server connections, and fiber Gigabit for backbone/campus attachments.

### Maximum Network Uptime

The switch provides the capability to operate with an optional redundant power supply. This gives you the added reliability against power interruption risks and is important for mission-critical applications. The switch comes standard with a single power supply. For campus/enterprise application, you can opt to install dual power supplies.

### VLANs for Performance & Security

When operating at Layer 2, you can set up VLANs for different ports or users to set broadcast domains and segment network traffic to manage available bandwidths and enhance network security.

### Port Trunks for Bandwidth Aggregation

You can combine up to 8 Fast Ethernet ports on the same module into a trunk to create a 1600Mbps full duplex aggregated bandwidth to connect to a server or to another switch. 2 Gigabit ports from the same module can be combined into to create a 4000Mbps trunk. Port trunking supports load-sharing and redundant backup links, and is useful for switch-to-switch cascading or server connection.

### Quality of Service (QoS)

With Quality of Service based on multi-layer information, your workstations and server can be attached to the switch and run delay-sensitive applications like video-conference and IP telephony based on traffic prioritization and queuing mechanism.

### IP Multicast (IGMP snooping)

The switch listens to IGMP (Internet Group Management Protocol) messages to build mapping table and associate forwarding filters. It uses GMRP (GARP Multicast Registration Protocol) to dynamically configure the switch ports to forward IP multicast traffic only to those ports associated with multicast hosts.

### Port Mirroring

This capability allows you to mirror adjacent ports for the purpose of analyzing incoming and outgoing packets where packets can be studied.

## Features

- Multi-layer routing chassis switch with flexible modularized design
- Very high port density, suitable for departmental and enterprise connection
- 6-slot chassis with open slots for installation of up to 96 10/100Mbps ports, or 72 Fast Ethernet fiber ports, or 12 Gigabit ports
- 32Gbps backplane bandwidth
- Enhanced security & performance with packet routing (Layer 3) and VLAN packet switching (Layer 2)
- IP, IPX, AppleTalk routing support
- QoS with multi-layer bandwidth control
- Traffic Priority Queues for VoIP, multimedia applications
- IGMP snooping for multimedia applications
- Port mirroring
- Port trunking supporting load sharing and redundant backup links
- Web-based and SNMP management, RMON monitoring
- SLIP/PPP remote management
- TFTP firmware upgradeable
- Optional redundant power supplies for maximum uptime
- Spanning Tree for redundant backup paths
- Modules hot swappable without requiring power off

### General

#### Topology

Star

#### Protocol

CSMA/CD

#### Data Transfer Rates

- Ethernet: 10Mbps (half duplex)
- 20Mbps (full duplex)
- Fast Ethernet:
- 100Mbps (half duplex)
- 200Mbps (full duplex)
- Gigabit Ethernet:
- 2000Mbps (full duplex)

### Hardware

#### Chassis

- Number of slots: 7
- Number of user-configurable slots: 6
- 2 redundant power supply bays
- Backplane switch fabric bandwidth: 32Gbps

#### DES-6302 Management Module

- Flash memory firmware (upgradable)
- CPU
- DB-9 RS-232 console port
- LED report: CPU status, Power
- Power alarm ON/OFF

#### DES-6303 10/100Mbps Copper Port Module

- IEEE 802.3 10BASE-T/802.3u 100BASE-TX standards
- 16 auto-sensing 10/100Mbps ports
- Full/half duplex support with ANSI/IEEE 802.3 NWay auto-negotiation
- IEEE 802.3x Flow Control in full-duplex, back pressure in half-duplex
- MDI-II/MDI-X auto-sensing for all twisted-pair ports
- Auto-correction of twisted-pair Rx reverse polarity
- 10BASE-T cables:
- UTP Cat. 4, 5 (100 m max.)
- EIA/TIA-568 150-ohm screened twisted-pair (STP) (100 m max.)
- 100BASE-TX cables:
- UTP Cat. 5 (100 m max.)
- EIA/TIA-568B 150-ohm screened twisted-pair (STP) (100 m max.)
- LED report (per port):
- 10/100Mbps speed
- Link/Act

#### DES-6304 Fast Ethernet Fiber Port Module

- IEEE 802.3u 100BASE-FX standard
- 12 100Mbps fiber ports (MT-RJ connectors)
- Full duplex support
- IEEE 802.3x Flow Control
- Cables:
- 50, 62.5/125 micron multi-mode fiber (2 km max.)
- LED report (per port): Link/Act

#### DES-6305 Fast Ethernet Fiber Port Module

- IEEE 802.3u 100BASE-FX standard
- 8 100Mbps fiber ports (SC connectors)
- Full duplex support
- IEEE 802.3x Flow Control
- Cables:
- 50, 62.5/125 micron multi-mode fiber (2 km max.)
- LED report (per port): Link/Act

#### DES-6306 Gigabit Fiber Port Module

- IEEE 802.3z 1000BASE-SX standard
- 2 Gigabit fiber ports (SC connectors)
- Full duplex support
- IEEE 802.3x Flow Control
- Cables: 50/125 micron multi-mode fiber (525 m max.), 62.5/125 micron multi-mode fiber (275 m max.)
- LED report (per port): Link/Act

#### DES-6307 Gigabit Fiber Port Module

- IEEE 802.3z 1000BASE-LX standard
- 2 Gigabit fiber ports (SC connectors)
- Full duplex support
- IEEE 802.3x Flow Control
- Cables: single-mode fiber (30km max.)
- LED report (per port): Link/Act

#### DES-6308 Gigabit Copper Port Module

- IEEE 802.3 10BASE-T/802.3u 100BASE-TX/IEEE 802.3ab 1000BASE-T standards
- 2 auto-sensing 10/100/1000Mbps ports
- Full/half duplex support with ANSI/IEEE 802.3 NWay auto-negotiation
- IEEE 802.3x Flow Control in full-duplex, back pressure in half-duplex
- 10BASE-T/100BASE-TX: full/half duplex
- 1000BASE-T: full duplex
- MDI-II/MDI-X auto-sensing for all twisted-pair ports
- Auto-correction of twisted-pair Rx reverse polarity

- 10BASE-T cables:

- UTP Cat. 4, 5 (100 m max.)
- EIA/TIA-568 150-ohm screened twisted-pair (STP) (100 m max.)
- 100BASE-TX/1000BASE-T cables:
- UTP Cat. 5/Cat. 5e (100 m max.)
- EIA/TIA-568B 150-ohm screened twisted-pair (STP) (100 m max.)
- LED report (per port):
- 100/1000Mbps speed
- Link/Act

#### DES-6309 GBIC Module

- IEEE 802.3z standard
- 2 GBIC ports for installation of 1000BASE-SX and 1000BASE-LX PHY modules
- Full duplex support
- IEEE 802.3x Flow Control
- Cables: single-mode and multi-mode fiber
- LED report (per port): Link/Act

### Software (Embedded Firmware)

#### VLAN (Layer 2)

- IEEE 802.1Q VLAN Tagging
- Port-based VLANs: 4K per VLAN
- GARP/GVRP

#### Spanning Tree (Layer 2)

- Standards:
- IEEE 802.1D Bridging STP (Spanning Tree Protocol)
- IEEE 802.1w Rapid Spanning Tree - Spanning Tree per VLAN
- Root Avoidance (ability to block the switch from becoming STP Root)
- 802.1w Rapid Spanning Tree (edge port support)
- 802.1s Multiple Spanning Tree Groups (proprietary)

#### IP Routing (Layer 3)

- IP forwarding enable/disable
- IP Proxy ARP
- IP Fragmentation support
- IP v4 support
- IP multi-netting
- Path MTU discovery
- VRRP support
- Routing protocols: RIP-1, RIP-2, OSPF v.2

#### IPX Routing (Layer 3)

Routing protocol: IPX-RIP

#### Apple Talk Routing (Layer 3)

Bridge support only

#### Quality of Service (QoS)

(Classification & Prioritization)

- Layer 2:
- Priority bits (IEEE 802.1p standard)
- Layer 3:
- IP TOS and DSCP bits
- IP destination & source addresses
- Layer 4:
- TCP/UDP port number
- Socket number

#### QoS (Others)

- Number of priorities queues: 4 per port
- Rate limit: physical port starting at 512Kbps
- Bandwidth control
- Broadcast storm control

#### Multicast

- GMRP
- IGMP v2
- IGMP Snooping
- PIM Dense mode
- PIM Sparse mode \*
- DVMRP

#### Security (Layer 2 Filters)

- MAC based: user-specified MAC addresses
- VLAN based: ingress checking enable/disable
- Port based: MAC address learning per port enable/disable

#### Security (Layer 3 Access Control List)

IP address based

#### Access Control

IEEE 802.1x Port-based Network Access Control

#### Link Aggregation (Port Trunking)

- Standard: 802.3ad
- Ether Channel interoperable
- 802.3ad compatible link aggregation
- Number of port trunks: 16 per device
- Number of ports per Ethernet/Fast Ethernet trunk: 8 ports
- Number of ports per Gigabit trunk: 2 ports

# DES-6300

## Technical Specifications

## Multi-layer Chassis Switch

### Queuing Mechanism

- WRR or Weighted RED
- Strict Priority Queuing

### Bandwidth Reservation

Resource Reservation Protocol (RSVP) \*

## Configuration & Management

### Configuration

- RS-232 port out-of-band configuration
- Web-based
- Telnet server
- TFTP client
- Bootp client
- DHCP client
- DHCP/Bootp relay agent

### Management

- Password enabled
- IP filtering on management interface
- NMS
- SNMP v1
- SNMP v.2c\*
- TFTP firmware upgradeable
- SLIP/PPP for remote management
- CLI (Command Line Interface)

### Management Agent

Supported protocols: IP, UDP, ARP, ICMP

### MIB

- SNMP (RFC 1157)
- SNMP v.2 (RFC 1907)
- MIB II (RFC 1213)
- Bridge (RFC 1493)
- RMON (RFC 1757, 1271)
- Ethernet (RFC 1643)
- IP Forwarding Table (RFC 2096)
- RIP-1 (RFC 1058)
- RIP-2 (RFC 1723)
- OSPF (RFC 2178)
- CIDR (RFC 2096)
- 802.1p (RFC 2674)
- Private MIB (proprietary)

### RMON

4 Groups: Statistics, History, Alarms, Events

### Port Configuration & Monitoring

- Auto-negotiation
- Port Mirroring

### Redundant Power Management

Power alarm

## Performance

### Switching Method (Layer 2)

- Store-and-forward

### MAC Address Table (Layer 2)

- 64K entries per device

### Auto MAC Address Learning

Address aging: 300 sec. (max.)

### Routing Tables

- IPv4: 64K entries
- IPX: 32K entries

### Packet Buffer Memory

16MB per module

## Physical & Environmental

### Redundant Power Supplies (DES-6310)

- Universal internal dual power supplies (1 provided, 1 optional)
- Current sharing design
- Redundant backup for continuous operation
- Hot-swappable capability allows change of power supply without turning OFF power
- Power management function enabled (power alarm ON/OFF)
- Revolving handles for easy removal
- Ventilation: 60 x 60mm DC fans x 2 (per power supply)

### Power Input

90 - 264VAC, 47 - 63Hz (per power supply)

### Power Output

- 3.3V: 80A max. (per power supply)
- 12V: 2A max. (per power supply)

### Ventilation

80 x 80 mm DC fans x 4 (built into chassis)

### Chassis Dimensions

440 (W) x 294 (D) x 356 (H) mm (excluding rubber feet)  
(17.32 x 11.57 x 14.01 inches)  
Standard 19-inch rack-mount width, 8 U height

### Chassis Weight

16.5kg (36.47 lb.) (includes DES-6301, DES-6302 and 1 DES-6310)

### Operating Temperature

0° - 50°C (32° - 122°F)

### Storage Temperature

-25° - 55°C (-13° - 131°F)

### Humidity

5% - 95% non-condensing

### EMI Certification

- FCC Class A
- VCCI Class A
- CE Class A
- C-Tick Class A

### Safety Certification

- UL/CUL
- TUV

\* Available in next release version

## Ordering Information

### Multi-layer Routing Switch Chassis

**DES-6300** Basic configuration (includes chassis + DES-6301 backplane + DES-6302 management module + 1 DES-6310 power supply)

### Optional Modules

**DES-6303** 16 10/100Mbps copper twisted-pair ports  
**DES-6304** 12 100BASE-FX fiber ports (MT-RJ connectors)  
**DES-6305** 8 100BASE-FX fiber ports (SC connectors)  
**DES-6306** 2 1000BASE-SX Gigabit fiber ports (SC connectors)  
**DES-6307** 2 1000BASE-LX Gigabit fiber ports (SC connectors)  
**DES-6308** 2 10/100/1000Mbps Gigabit copper twisted-pair ports  
**DES-6309** 2 Port GBIC module  
**DES-6310** Universal redundant power supply (see specifications above)

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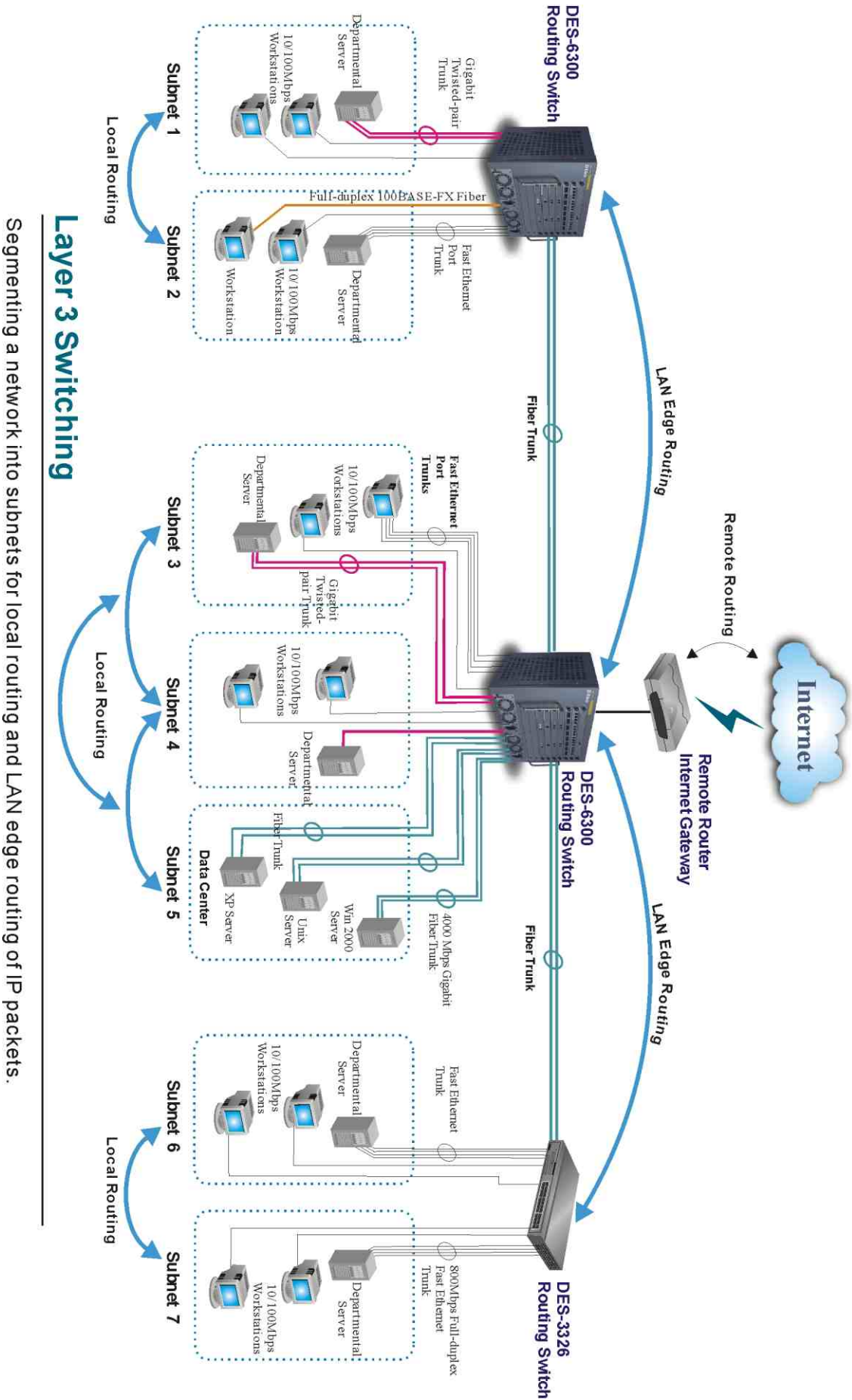
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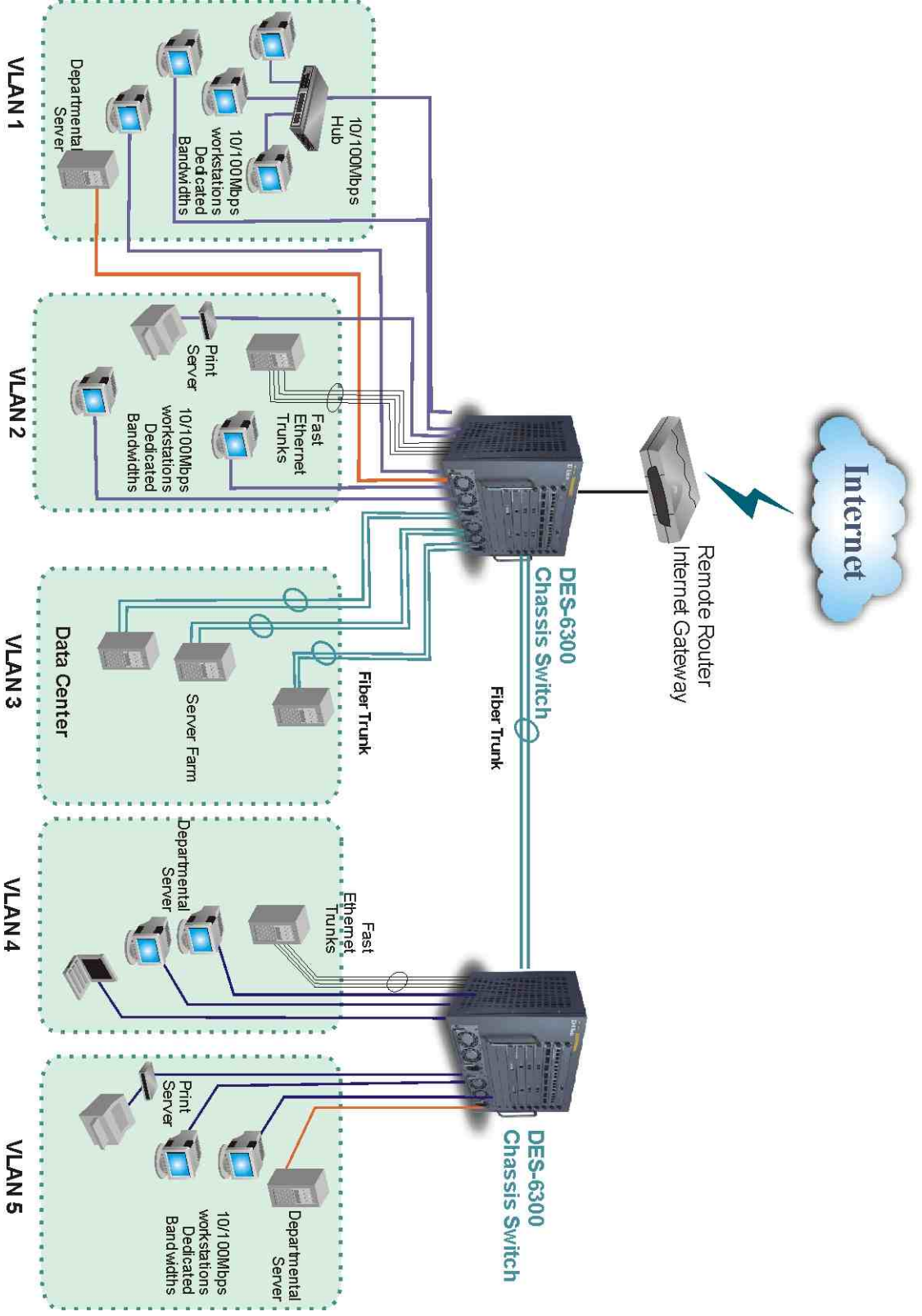
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Layer 3 Switching

Segmenting a network into subnets for local routing and LAN edge routing of IP packets.



**Layer2 Switching**

Segmenting a network into VLANs to enhance performance and security.