DES-3326SR with 24 10/100Mbps ports. A stack module installed in the open slot provides a GBIC port and switch stacking capability.

24-Port Layer 3 Fast Ethernet Stackable Switch With Redundant Power Support

The DES-3326SR is a Stackable Multi-layer Routing Switch that combines wire-speed Layer 2 switching with basic Layer 3 IP packet routing and quality of service (QoS), all in one single box. It provides 24 10/100Mbps ports, 1 expansion slot for installation of a Fast Ethernet or Gigabit module, redundant backup power support, and scalable expansion of up to 8 units per stack. Designed to give everything a business needs for today's switched networks, this switch gives you the edge device simplicity and the price/performance ratio ideal for departmental connection.

24 10/100Mbps Ports for Workstation Connection

The switch provides 24 10/100Mbps ports supporting auto-sensing and auto-negotiation of network speeds and full/half duplex. These ports can connect to workstations and print servers, giving each a dedicated bandwidth. All ports support auto MDI/MDIX uplink, allowing you to connect to workstations, servers, or other switches from any port without the need to change your usual straight-through twisted-pair cables.

Scalable Expansion

Up to 8 DES-3326SR switches can be stacked together. You can add units to reach maximum 192 10/100Mbps ports and 8 GBIC-based ports per stack. The switches are stacked together through high-speed stack cables that provide multi-gigabit per second back plane, allowing the entire stack to perform as a single entity.

Wire-speed IP Routing

The switch is designed for basic IP routing, with instant support for Windows, Unix and Internet environments. It provides wire-speed non-blocking switch fabrics with hardware-based packet filtering/forwarding. Packet routing is performed by on-board ASICs at speeds many times faster than CPU-based routers.

Seamless Integration

The switch can be instantly integrated into any existing network for seamless integration of Layer 2 and Layer 3 packet switching. With multi-layer support for every port, you can start with Layer 2 switching, then upgrade to Layer 3 routing anytime by simply re-configuring the ports. You can flexibly segment the network into domains and sub-domains, using (1) subnet IDs and user IP numbers 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 Layer 3, it looks at the user-specified routing table to route packets to their destinations.

Ready for Multimedia, Video Applications

With Priority Queues and IP multicast (IGMP snooping) support, Quality of Services (QoS) can be guaranteed for successful execution of delay-sensitive applications like video conference.

Flow Control to Prevent Packet Loss

The switch supports standard IEEE 802.3x Flow Control. Working in conjunction with buffer overrun auto-detection, this full-duplex data transfer mode provides protection against possible data loss for 802.3x supported servers directly connected to the switch.

Port Trunks for Aggregated Bandwidths

With low cost per port, port trunks supporting static Link Aggregation standard provide an easy and economical alternative solution for server connection to attain Gigabit bandwidth. Up to 8 10/100Mbps ports or 8 Gigabit ports can be combined together to create a multi-link load-sharing aggregated bandwidth to a server. Port trunks can span multiple units of the stack for fail-safe connectivity to mission-critical servers and the network center. Up to 8 multi-link trunks can be configured for a stack.

VLANs for Enhanced Security & Performance

VLANs improve security and bandwidth utilization by limiting the broadcast domains and confining intra-group traffic within their segments. To segment up the network, workstations supporting IEEE 802.1Q VLAN Tagging connected to the switch can be grouped into different Virtual LANs (VLANs). The switch also supports GVRP (GARP VLAN Registration Protocol) for automatic VLAN configuration distribution.

Advanced Network Access Management

802.1x features enable user authentication for each network access attempt. Port security features allow you to limit the number of MAC addresses per port in order to control the number of stations for each port. Static MAC addresses can be defined for each port to ensure only registered machines are allowed to access. By enabling both of these features, you can establish an access mechanism based on user and machine identities, as well as control the number of access stations.

Multi-layer Access Control List (ACL)
Access Control Lists (ACL) allow the network administrator to define policies on network traffic control. The switch supports comprehensive and multi-layer ACLs, providing a powerful tool for network management. For example, the switch can be set to block malicious bulk traffic from specific clients (based either on MAC or IP addresses). Or during a virus attack, the switch can be set to restrict its flooding based on a virus's unique pattern (TCP/UCP port number).

Advanced QoS Support
The switch supports not only Layer 2 802.1p Priority Queue control, but also a variety of ways to prioritize network packets. Multi-layer information from L2 to L4 can be used to classify packet priorities. This function support allows you to attach IP telephony devices or video servers to the switch to run delay-sensitive applications like video conference.

Flexible Transmission Scheduling
The switch supports 2 methods of packet transmission scheduling: Strict Round-Robin (SRR) and Weighted Round-Robin (WRR). You can select to use SRR to strictly enforce your priority queues, or WRR to address bandwidth limitations at peak time. WRR allows each queue to be assigned a different percentage of the output port's bandwidth, so that lower-priority queues are not denied access to buffer space and port bandwidth.

IGMP Snooping for Broadcast Control
The switch listens to IGMP (Internet Group Management Protocol) messages to build mapping table and associate forwarding filters. It dynamically configures the switch ports to forward IP multicast traffic only to those ports associated with multicast hosts.

Broadcast Storm Control
To prevent too many broadcast/multicast packets from flooding the network, broadcast/multicast storm control is configured to screen excessive traffic. Threshold values are available to control the rate limit for each port. Packets are discarded if the respective count exceeds the configured upper threshold in a given time interval. The possible range of upper threshold is from 0 to 255k packets per second.

Port Mirroring
This function allows you to mirror adjacent ports for the purpose of analyzing incoming and outgoing packets where packet patterns can be studied.

802.1D Spanning Tree & 802.1w Rapid Spanning Tree Support
For mission critical environments with multiple switches supporting STP, you can configure the stack of switches with a redundant backup bridge path, so transmission and reception of packets can be guaranteed in event of any fail-over switch on the network.

Multiple Management Interfaces
SNMP v.1, v.2c, v.3 network management is supported, using the built-in MIBs. RMON monitoring and SYSLOG are provided for effective central management. The switch also provides a Command Line Interface (CLI) and a Web-based GUI. CLI enables quick system configuration for administrators familiar with command line operation. The embedded Web-based interface allows you to easily access the switch from anywhere on the network and troubleshoot it in real-time. You can, for example, browse the MAC address table via the Web browser and perform searching to identify the location of any workstation. Port utilization graphs provide real-time traffic monitoring and diagnostic information.

Optional Ports (Stand-alone Configuration)
If you configure the DES-3326SR as a stand-alone switch, you can install the following modules in the open slot:

- 2-port Fast Ethernet module (10/100BASE-TX)
- 1 or 2-port Fast Ethernet multi-mode fiber module (100BASE-FX)
- 1 or 2-port Fast Ethernet single-mode Fiber module (100BASE-FX)
- 2-port Gigabit fiber module (1000BASE-SX)
- 2-port Gigabit fiber module (1000BASE-LX)
- 2-port Gigabit copper module (1000BASE-T)
- GBIC module (2 GBIC slots)

Gigabit Over Copper Twisted-pair
The optional Gigabit copper ports provide an inexpensive alternative solution to the fiber. Using your existing low-cost Cat. 5 twisted-pair wires as the transmission media, these ports allow you to instantly upgrade your servers to Gigabit capability without requiring you to install new, expensive fiber cables.

Redundant Power Support
The switch can be connected to an external power supply for redundant power backup purposes. In case the built-in internal power supply fails, the redundant power supply unit will automatically provide all the required power to ensure continuous operation. For redudant power supply, the following can be deployed:

- DPS-200 redudant power supply, providing 60 watts of power
- DPS-900 8-slot standard rack-mountable chassis, for installation of 8 DPS-200 power supply units for a stack of 8 DES-3326SR switches

Key Features

- *24 built-in 10/100Mbps ports*
- *Switch stacking configuration: 8 units per stack + 8 GBIC ports*
- *1 open slot for 2 additional 10/100Mbps ports, 1 or 2 Fast Ethernet fiber ports or 2 Gigabit ports (stand-alone configuration)*
- *Redundant power backup support*
- *8.8Gbps switching fabric*
- *Auto MDI/MDIX for all twisted-pair ports*
- *Static Link Aggregation port trunks of up to 8 Fast Ethernet ports*
- *IP routing supporting RIP-1, RIP-2, OSPF routing protocols, DVMRP, PIM Dense mode*
- *Supports 802.1Q VLAN, IGMP snooping, 802.1p Priority Queues, port mirroring*
- *Multi-layer ACL and QoS support*
- *Administrator-definable port security*
- *802.1x port access control*
- *Per-port bandwidth control*
- *Broadcast storm control*
- *802.3x Flow Control*
- *802.1D and 802.1w Spanning Tree for redundant backup bridge paths*
- *SNMP v.1, v2c, v.3 network management, RMON monitoring*

General

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

Basic Configuration
- 24 auto-sensing 10/100Mbps ports (built-in)
- 1 open slot

Switch Fabric
8.8 Gbps

LED
- Power (per device)
- Console (per device)
- RPS (per device)
- 10/100Mbps speed (per port)
- Link/Act (per port)

Built-in Ports Supported Functions
- IEEE 802.3 10BASE-T/802.3u 100BASE-TX standards
- 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/MDIX auto-sensing for all twisted-pair ports
- Auto-correction of twisted-pair Rx reverse polarity
- 10BASE-T cables:
  UTP Cat. 3, 4, 5 (100 m max.)
- 100BASE-TX cables:
  UTP Cat. 5 (100 m max.)

Optional Modules

DES-332GS Stack + GBIC Module
- 1 stacking port
- 1 GBIC slot (IEEE 802.3z/802.3ab standards)
- Stackable units: 8 switches per stack
- Stacking method: ring
- Full duplex support for GBIC slot
- IEEE 802.3x Flow Control (GBIC slot)
- Stacking cable: proprietary IEEE 1394 cable (provided)
- Network cables (GBIC slot): single-mode and multi-mode fiber
- LED report (per port): Link/Act (GBIC slot)

DES-132 10/100Mbps Fast Ethernet Module
- IEEE 802.3 10BASE-T/802.3u 100BASE-TX standards
- 2 10/100Mbps ports
- IEEE 802.3x Flow Control in full-duplex, back pressure in half-duplex
- Auto MDI/MDIX for each port

DES-131F/132F Fast Ethernet Fiber Module
- IEEE 802.3u 100BASE-FX standard
- 1/2 100Mbps fiber port(s) (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-131FL/132FL Fast Ethernet Fiber Module
- IEEE 802.3u 100BASE-FX standard
- 1/2 100Mbps fiber port(s) (SC connectors)
- Full duplex support
- IEEE 802.3x Flow Control
- Cables: 9-micron single-mode fiber (15 km max.)
- LED report (per port): Link/Act

DES-132G Gigabit Fiber 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-132GL Gigabit Fiber 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 (5 km max.)
- LED report (per port): Link/Act

DES-132T Gigabit Copper 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/MDIX auto-sensing for all twisted-pair ports
- Auto-correction of twisted-pair Rx reverse polarity
- 10BASE-T cables:
  UTP Cat. 3, 4, 5 (100 m max.)
- 100BASE-TX/1000BASE-T cables:
  UTP Cat. 5/Cat. 5e (100 m max.)
- LED report (per port):
  100/1000Mbps speed
  Link/Act

DES-132GB GBIC Module
- IEEE 802.3z standard
- 2 GBIC slots for installation of Gigabit transceivers
- Full duplex support
- IEEE 802.3x Flow Control
- Cables: single-mode and multi-mode fiber, twisted-pair cable
- LED report (per port): Link/Act

Software

IP Routing
- IP v4 support
- IP multi-netting
- IP Fragmentation support
- Routing protocols supported:
  Static routing
  RIP-1, RIP-2
  OSPF v.2

VLAN
- IEEE 802.1Q Tagged VLAN
- Port-based VLAN
- Number of VLANs: 255 per device (max.)

Spanning Tree
- 802.1D Spanning Tree
- 802.1w Rapid Spanning Tree

Multicast
- IGMP v2
- IGMP Snooping
- DVMRP
- PIM-DM

Priority Queues (CoS)
- Standard: IEEE 802.1p
- Number of queues: 4

Traffic Classification (CoS)
Can be based on user-definable application types:
- TOS
- Diffserv (DSCP)
- Port-based
- MAC address
- IP address
- TCP/UCP port number

Access Control Security
- Port security
- 802.1x user authentication
- RADIUS client
- Multi-layer ACL (Access Control List) based on:
  Port number
  TOS
  Diffserv (DSCP)
  MAC address
  IP address
  User-definable applications

MultiLink Trunking (MLT)
Enables grouping of links between the switch and another switch or a server to provide higher bandwidth of up to 8 10/100 ports or up to 8 Gigabit ports with active redundant links. A multi-link is defined as trunked ports spanning multiple units of the stack for fail-safe connectivity to mission-critical servers and the network center.

- Number of Fast Ethernet ports per trunk: 8 (max.)
- Number of Fast Ethernet ports per multi-link trunk: 8 (max.)
- Number of Gigabit ports per multi-link trunk: 8 (max.)
- Number of trunks per switch: 6 (max.)
- Number of multi-link trunks per stack: 8 (max.)
- Operation mode: load sharing

Performance

Transmission Method
Store-and-forward

MAC Address Table
8K entries per device

MAC Address Learning
- Dynamic entries: automatic update
- Static entries: user-defined

Routing Table
2K entries per device

Layer 2 Packet Forwarding Rates (half duplex)
- Ethernet: 14,880 pps per port
- Fast Ethernet: 148,810 pps per port
- Gigabit Ethernet: 1,488,100 pps per port

Layer 3 Packet Forwarding Rate (half duplex)
6.6Mpps

RAM Buffer
16 MB per device (excluding optional modules)

Configuration & Management

Management Methods & Standards
- SNMP management v.1, v.2c, v.3
- Web-based management (via web browser)
- RMON monitoring
- Telnet (up to 8 sessions)
- CLI (command line interface)

Management Security
Password enabled

MIBs
- MIB-II (RFC 1213)
- Bridge MIB (RFC 1493)
- RMON MIB (RFC 1757)
- RIP (RFC 1724)
- OSPF (RFC 1850)
- CIDR (RFC 2096)
- 802.1Q VLAN MIB (RFC 2674)
- IGMP MIB (RFC 2833)
- If MIB (RFC 2233)
- Ethernet-like MIB (RFC 2358)
- dot3statsTable
- D-Link enterprise MIB

RMON Groups
1, 2, 3, 9 (Alarm, Statistics, History, Event)

IP Number Self-identification
- DHCP client
- Bootp client

Firmware Upgrade
TFTP

Console Port
DB-9 RS-232 DCE

Physical & Environmental

Power Input
100 - 240 VAC, 50/60 Hz
Internal universal power supply

Redundant Power Backup Support
Connector to connect to external redundant power supply

Power Consumption
60 watts (max.)

Ventilation
40 x 40 mm DC fans x 2

Operating Temperature
0˚ - 40˚C

Storage Temperature
-25˚ - 55˚C

Humidity
5% - 95% non-condensing

Dimensions
441 x 210 x 43 mm (17.36 x 8.27 x 1.69 inches)
19-inch rack-mount width, 1 U height

Weight
2.5 kg (5.51 lb.) (without module installed)

Emission (EMI)
- FCC Class A
- CE Class A
- C-Tick Class A

Safety
CSA International

ACN 052 202 838

CSA60950
UL 60950
IEC 60950
EN 60950

Ordering Information

10/100Mbps Stackable Layer 3 Switch

DES-3326SR	24 10/100Mbps ports , 1 open slot, redundant power support

Optional Port Module

DES-332GS	1 stacking port + 1 GBIC port
DES-132	2 10/100Mbps ports
DES-131F	1 100BASE-FX multi-mode fiber port (SC connector)
DES-132F	2 100BASE-FX multi-mode fiber ports (SC connectors)
DES-131FL	1 100BASE-FL single-mode fiber port (SC connector)
DES-132FL	2 100BASE-FL single-mode fiber ports (SC connectors)
DES-132G	2 1000BASE-SX Gigabit fiber ports (SC connectors)
DES-132GL	2 1000BASE-LX Gigabit fiber ports (SC connectors)
DES-132T	2 10BASE-T/100BASE-TX/1000BASE-T Gigabit copper ports
DES-132GB	2 GBIC-based ports

Optional GBIC Transceivers

DGS-701	For 1000BASE-SX, multi-mode fiber, 550 m max.
DGS-702	For 1000BASE-LX, single-mode fiber, 5 km max.
DGS-703	For 1000BASE-LX, single-mode fiber, 10 km max.
DGS-704	For 1000BASE-LX, single-mode fiber, 30 km max.
DGS-708	For 1000BASE-LX, single-mode fiber, 70 km max.
DGS-711	For 1000BASE-T, Cat. 5 cable, 100 m max.

Optional Redundant Power Supply

DPS-200	Redundant power supply
DPS-900	8-slot redundant power supply chassis

D-Link®

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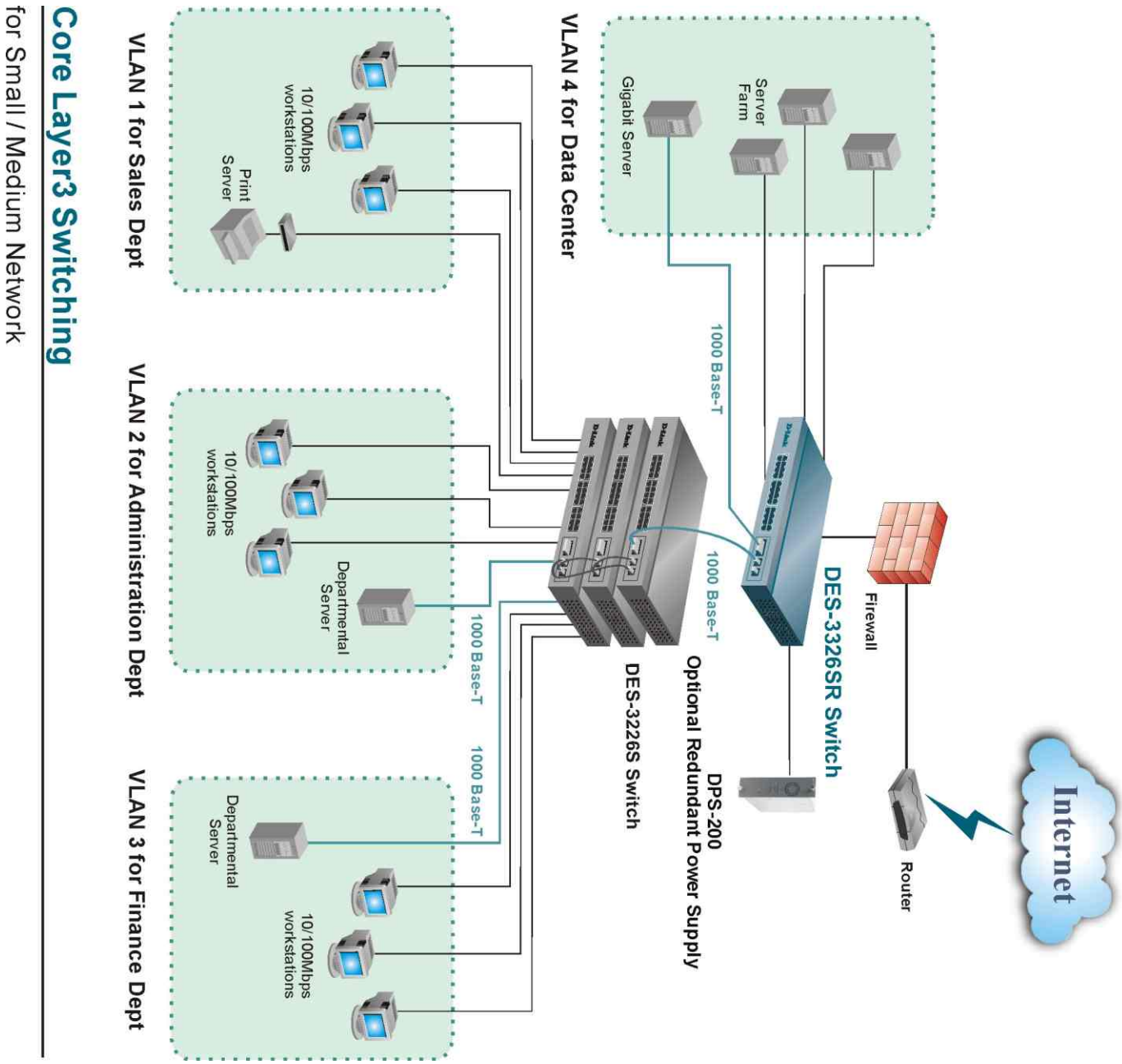
Finland	TEL: 358-9-2707-5080	FAX: 358-9-2707-5081
Singapore	TEL: 65-6774-6233	FAX: 65-6774-6322
Australia	TEL: 61-2-8899-1800	FAX: 61-2-8899-1868
Japan	TEL: 81-3-5434-9678	FAX: 81-3-5434-9868
China	TEL: 86-10-8518-2533	FAX: 86-10-8518-2250
India	TEL: 91-22-652-6696	FAX: 91-22-652-8914
Egypt	TEL: 202-62-44615	FAX: 202-62-44583
UAE	TEL: 971-4-3916480	FAX: 971-4-3908881
Turkey	TEL: 90-212-335-2525	FAX: 90-212-335-2500
Israel	TEL: 972-9-9715700	FAX: 972-9-971-5601
Chile	TEL: 56-2-232-3185	FAX: 56-2-232-0923
Brasil	TEL: 55-11-3094-2910	FAX: 55-11-3094-2921
South Africa	TEL: 27(0)1266-52165	FAX: 27(0) 1266-52186
Russia	TEL: 7-095-737-3389	FAX: 7-095-737-3390
Taiwan	TEL: 886-2-2910-2626	FAX: 886-2-2910-1515
D-Link Corp.	TEL: 886-2-2916-1600	FAX: 886-2-2914-6299

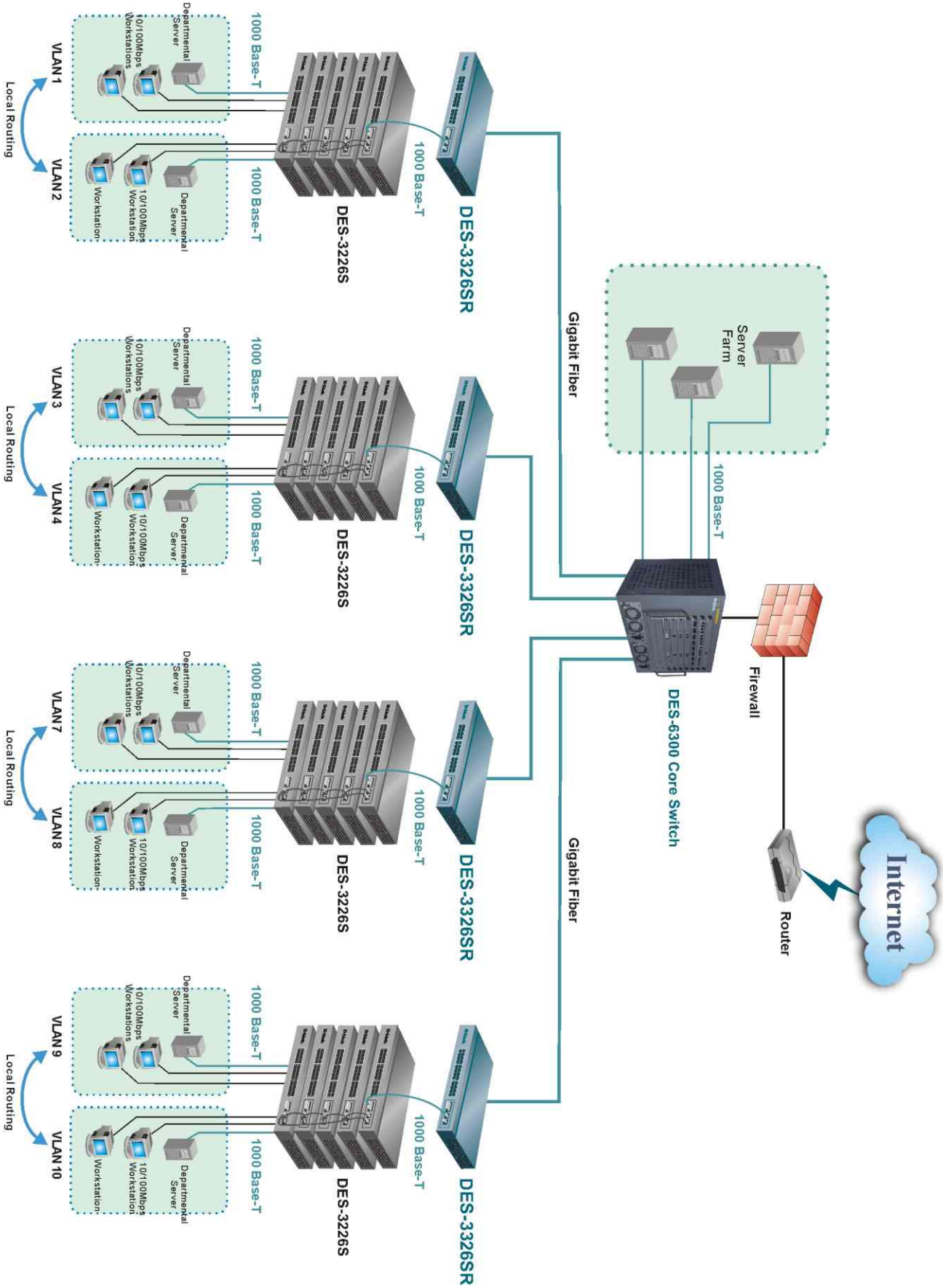
RECYCLABLE

Rev. 01 (Jun. 2003)



Core Layer3 Switching

for Small / Medium Network



Distributed Routing Implementation

For Large Enterprise & Compus Network