D-Link®

Business & Enterprise SOLUTIONS

xStack™

"Best in Test"
Network Magazine
DGS-3324SR
MAY 2004

———— DGS-3324SRi

———— DGS-3324SR

———— DXS-3350SR

———— DXS-3326GSR

———— DES-3352SR

xStack

The Ultimate Stackable Alternative to Meet Your Chassis Requirements

D-Link's next-generation switches xStacks are high port-density Layer 3 stackable switches that combine the ultimate performance with fault tolerance, security, management functions with flexibility and ease-of-use. All these features typically found in the more expensive chassis-based solutions, at the price of a stackable!

Fault Tolerant Star Stacking

Each D-Link xStack switch is equipped with 2 stacking ports providing 20Gbps full duplex bandwidth. Up to 6 xStack switches can be stacked with a Stacking Master, itself equipped with 6 stacking ports providing 120Gbps aggregated stacking bandwidth. Star stacking provides fault tolerance, and switch units can be added or removed without interrupting the service of the entire stack. The switches are stacked together through high-speed stack cables, allowing the entire stack to operate as a single high-performance entity.

Ring Stacking Topology

Shared 40Gbps stacking bandwidth in the ring topology is also provided for installation sites with fewer switches to stack, so you don't have to add a Stacking Master. In a ring stacking scheme, xStack supports up to 12 units per stack. No matter if the Star or Ring topology is employed, you can easily see the ID number of the stacked units from the LED display on the front panel of each switch.

High Gigabit Port-Density

D-Link's xStack provides up to 48 Gigabit ports per switch in a low-profile 1-U rack-mount case. This gives you up to 312 Gigabit ports per stack in the star architecture, or maximum 384 Gigabit ports per stack in the ring topology. This high Gigabit port density allows your xStack to be deployed either as a core switch or as an easily expandable stack for Gigabit-to-the-desktop applications.

10G Uplinks 10 Times the Speed of Gigabit*

D-Link xStack provides the 10G uplinks for transmission at 10 times the speed of a Gigabit port. The 10G uplinks are available as optional modules each equipped with 2 XFP compliant slots, into which you can install 2 IEEE 802.3ae-compliant XFP transceivers for data transmission at 20,000Mbps in the full duplex mode.

### Complete Solution for Mid-Sized Businesses & Enterprises

Whether you need to bring Gigabit or just conventional 10/100Mbps speed to your organization's desktops, D-Link xStack has the right solution with right port types, port densities and uplinks to match your requirements. With scalability and flexibility built in, individual 10/100Mbps Ethernet and 10/100/1000Mbps Gigabit units may be joined in any combination to evolve with your network needs.

Wire-speed Packet Routing

D-Link xStack provides wire-speed non-blocking switch fabrics with very fast hardware-based packet filtering/forwarding and instant support for Windows, Unix and Internet environments. Packet routing supports RIP v.1, v.2, OSPF and DVMRP protocols, performed by on-board ASICs at speeds many times faster than CPU-based routers.

Stackable Switches

xStack™ - Ring (Bus) Architecture

Stackable Switches

Stacking Master

Stackable Switches
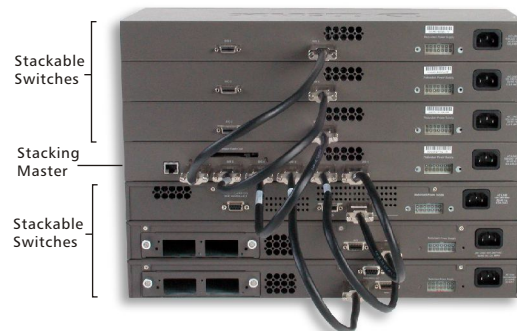
xStack™ - Star Architecture

Plug-and-Play Configuration

The xStack simplifies and speeds up your management tasks, as multiple switches can be configured, monitored and maintained from any workstation running a web browser through one single IP address. The stack is managed as a single object, and all stacked units are identified by a single IP address. A simple yet powerful web-based interface allows you to perform most comprehensive management and configuration tasks, eliminating the need for you to install expensive, complex SNMP network management software.

Easy Expansion Beyond Your xStack

With D-Link SIM (Single IP Management) support, you can easily add up to 32 switch units per stack outside of your xStack that are not limited to any specific models. Through the built-in web manager, you can have a Tree View with clear information about the members of the stacks, and your Network Topology that shows the locations of the stacked units and their link information. Your xStack's support for any switch models with embedded Single IP Management means that you can expand your stack to include also L2 access-level or any other switches to accommodate your network growth.

Comprehensive Security

D-Link's xStack provides a complete set of security features for connectivity and access control. This set includes Access Control Lists (ACLs) based on MAC address, switch port, IP address, and/or TCP/UDP port numbers, 802.1x user authentication and MAC address control. The xStack also provides central management for administration access via TACACS/TACACS+ and RADIUS. Together with network application control, this security ensures that not only proper user access is served, but malicious traffic is also prevented from being spread across the network.

Enhanced Network Performance & Availability

D-Link's xStack provides extensive VLAN support including GARP/GVRP and 802.1Q to enhance network security and performance. Bandwidth control allows you to set traffic limit for each port to control the traffic volume from the edge of the network. The xStack supports redundant power option to maximize network uptime. Other features include 802.3ad Link Aggregation, 802.1d Spanning Tree and 802.1w Rapid Spanning Tree to increase network reliability and availability of your stack.

Multi-layer Quality of Service (QoS)

The xStack implements a robust set of multi-layer (L2, L3, L4) QoS/CoS features to ensure that critical network services like VoIP, ERP, Intranet and video conference are served with proper priority. Up to 8 priority queues for 802.1p/TOS/DiffServ are supported, with classification and marking based on MAC SA/DA, IP SA/DA, and/or TCP/UDP port numbers.

Virtual Router Redundancy Protocol (VRRP) Support

D-Link xStack supports the Virtual Router Redundancy Protocol (VRRP), allowing several L3 switches on a multi-access link to utilize the same virtual IP address. One switch will be elected as a master with the other switches acting as backups in case of the failure of the master router. This VRRP support provides convenience, permitting your host system to be configured manually or via DHCP with a single default gateway.

Extensive Network Management Functions

The xStack supports a variety of network management options including: console CLI, Telnet configuration, web-based and SNMP v.1, v.2c, v.3 management, RMON monitoring, TFTP firmware upgrade, Port Mirroring for troubleshooting, Bootp and DHCP IP assignment. The xStack also supports a variety of advanced traffic management options including: 802.1x, Bandwidth Control, Broadcast Storm Prevention, and support for IGMP v.1, v.2 snooping.

Key Features

- High port density per switch, with comprehensive 10/100Mbps, copper Gigabit, SFP fiber Gigabit support
- Very high-speed 10G uplink option 10 times faster than Gigabit *
- Fault tolerant star stacking
- Up to 7 units per stack, maximum 312 Gigabit ports per stack (star stacking)**
- Up to 12 units per stack, maximum 384 Gigabit ports per stack (ring stacking)***
- High bandwidth 120Gbps star stacking, 40Gbps ring stacking
- Wire-speed packet routing supporting RIP v.1, v.2, OSPF, DVMRP, PIM Dense mode
- Per-port bandwidth control & multi-layer (L2, L3, L4) QoS/CoS

- Advanced Access Control Lists (ACL), enhanced TACACS/TACACS+ and RADIUS authentication
- 802.3ad Link Aggregation port trunks
- Jumbo frame support
- High availability with redundant power supply, Spanning Tree support
- Single IP Management, SNMP v.1, v.2c, v.3 support, RMON monitoring, Syslog, web-based management, Telnet, CLI through console port

* 10G supported on switch models DXS-3326GSR and DXS-3350SR only.
** Calculation based on 6 units of DXS-3350SR stacked with a DGS-3324SRi Stacking Master.
*** Calculation based on 8 units of DXS-3350SR ring-stacked together.

The xStack Switches & Modules

DGS-3324SRi

24-Port L3 Gigabit Stacking Master

- 24 1000BASE-T Ports
- 8 Combo SFP
- 6 Stacking Ports

DGS-3324SR

24-Port L3 Gigabit Switch

- 24 1000BASE-T Ports
- 4 Combo SFP
- 2 Stacking Ports

DXS-3350SR

50-Port L3 Gigabit Switch

- 48 1000BASE-T Ports
- 4 Combo SFP
- 2 Stacking Ports
- 1 Open Slot for Optional 10G Uplink Module

DES-3352SR

52-Port L3 10/100Mbps Switch

- 48 10/100BASE-TX Ports
- 2 1000BASE-T Ports
- 2 SFP
- 2 Stacking Ports

DXS-3326GSR

26-Port L3 Gigabit Switch

- 24 SFP
- 4 Combo 1000BASE-T Ports
- 2 Stacking Ports
- 1 Open Slot for Optional 10G Uplink Module

DEM-420X

Optional 10G Uplink Module

- 10G Module With 2 XFP slots

xStack

Technical Specifications

Hardware

Device Ports
DGS-3324SRi:
- 24 10/100/1000BASE-T Gigabit ports
- 8 Combo SFP
- 6 stacking ports
- 1 CompactFlash slot
- 1 console port

DGS-3324SR:
- 24 10/100/1000BASE-T Gigabit ports
- 4 Combo SFP
- 2 stacking ports
- 1 console port

DES-3352SR:
- 48 10/100BASE-TX Ethernet ports
- 2 10/100/1000BASE-T Gigabit ports
- 2 SFP
- 2 stacking ports
- 1 console port

DXS-3326GSR:
- 24 SFP
- 4 Combo 10/100/1000BASE-T Gigabit ports
- 2 stacking ports
- 1 open slot
- 1 console port

DXS-3350SR:
- 48 10/100/1000BASE-T Gigabit ports
- 4 Combo SFP
- 2 stacking ports
- 1 open slot
- 1 console port

Port Standard/Function Support
- IEEE 802.3 10BASE-T/802.3u 100BASE-TX/802.3ab 1000BASE-T
- ANSI/IEEE 802.3 NWay auto-negotiation
- IEEE 802.3x Flow Control
- Auto MDI/MDIX
- Port mirroring

SFP Support
- IEEE 802.3z 1000BASE-LX (DEM-310GT transceiver)
- IEEE 802.3z 1000BASE-SX (DEM-311GT transceiver)
- IEEE 802.3z 1000BASE-LH (DEM-314GT transceiver)
- IEEE 802.3z 1000BASE-ZX (DEM-315GT transceiver)

XFP Support
- IEEE 802.3ae 10GBASE-SR(DEM-421XT transceiver)
- IEEE 802.3ae 10GBASE-LR(DEM-422XT transceiver)

Maximum Number of Units per Stack *
- DGS-3324SR: star stacking 6 units, ring stacking 12 units
- DES-3352SR: star stacking 6 units, ring stacking 12 units
- DXS-3326GSR: star stacking 6 units, ring stacking 12 units
- DXS-3350SR: star stacking 6 units, ring stacking 8 units

* In the ring stacking scheme, maximum 12 units per stack if only DGS-3324SR, DES-3352SR and DXS-3326GSR (any combination) are used. If DXS-3350SR is included in the stack, maximum number of units per stack will be less than 12. Star stacking requires a DGS-3324SRi Stacking Master.

Stacking Port Speed
20,000Mbps full-duplex per port

Switch Fabric
- DGS-3324SRi: 168Gbps
- DGS-3324SR: 88Gbps
- DES-3352SR: 57.6Gbps
- DXS-3326GRS: 128Gbps
- DXS-3350SR: 176Gbps

Packet Forwarding Rate
- DGS-3324SRi: 125Mpps
- DGS-3324SR: 65.5Mpps
- DES-3352SR: 43Mpps
- DXS-3326GRS: 95Mpps
- DXS-3350SR: 131Mpps

Packet Buffer Memory
- DGS-3324SRi: 2MB
- DGS-3324SR: 2MB
- DXS-3326GRS: 2MB
- DXS-3350SR: 4MB

Maximum IP Address Table Entries
All models: 3K

Maximum MAC Address Table Entries
All models: 16K

Software

IP Routing
- IP v.4 support
- IP Fragmentation support
- Multiple IP interfaces per VLAN
- Routing protocols supported:
  Static routing
  RIP v.1, RIP v.2
  OSPF v.2

VLAN
- Port-based VLAN
- IEEE 802.1Q Tagged VLAN
- GARP/GVRP
- Maximum number of VLANs
  Dynamic: 255
  Static: 4K

Priority Queues (CoS)
- Standard: IEEE 802.1p
- Maximum number of queues: 8

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

Access Security
- 802.1x port-based access control
- 802.1x MAC-based access control
- Port security
- SSH
- SSL

Access Control List
Multi-layer ACL based on:
- MAC address
- TOS
- Diffserv (DSCP)
- IP address
- Packet protocol type
- TCP/UDP port number (user-definable application types)
- TCP/UDP payload (user-definable packet content)
- Per port ACL definition
- IPv6 address
- IPv6 traffic class
- IPv6 flow label

Spanning Tree Protocol
- 802.1D Spanning Tree compatible
- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree

IP Multicast
- IGMP v.2
- DVMRP
- PIM Dense mode
- VRRP

Port Trunk
- Maximum number of ports per trunk: 8
- Maximum number of trunks per stack: 32
- Operation mode support: load sharing
- 802.3ad compatible Link Aggregation (LACP)

Transmission Method
Store-and-Forward

Jumbo Frame
9KB (max.)

Configuration & Management

Management Support
- D-Link SIM (Single IP Management)
- SNMP v.1, v.2c, v.3
- Web-based management
- Web GUI traffic monitoring
- Web-based MAC address browsing
- CLI (command line interface)
- RMON monitoring
- Telnet server (up to 8 sessions)
- TACACS/TACACS+ authentication on switch admin access
- RADIUS authentication on switch admin access
- SYSLOG
- DHCP/Bootp relay
- DNS relay
- Dual Images
- Back-Door function
- Port description
- CPU utilization monitoring

MIBs
- MIB-II (RFC 1213)
- Bridge MIB (RFC 1493)
- RMON MIB (RFC 1757)
- 802.1p Priority Queues (RFC 2674)
- 802.1Q VLAN MIB (RFC 2674)
- IGMP MIB (RFC 2833)
- If MIB (RFC 2233)
- Ethernet-like MIB (RFC 1643)
- RIP MIB (RFC 1724)
- OSPF MIB (RFC 1850)
- CIDR MIB (RFC 2096)
- D-Link enterprise MIB

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

IP Number Self-identification
Through DHCP client, Bootp client

Firmware Upgrade
TFTP

Physical & Environmental

Dimensions
(W x D x H) (device only)
- DGS-3324SRi, DGS-3324SR: 441 x 207 x 44 mm
- DES-3352SR: 441 x 309 x 44 mm
- DXS-3326GSR, DXS-3350SR: 441 x 430 x 44 mm
19-inch rack-mount width, 1U height

Weight
(without optional module, device only)
- DGS-3324SRi, DGS-3324SR: 3.15 kg
- DES-3352SR: 4.75 kg
- DXS-3326GSR: 6.5 kg
- DXS-3350SR: 6.41 kg

Power Supply
- 100 to 120VAC, 200 to 240VAC, 50/60Hz
- Internal universal power supply
- Optional external redundant power supply support

Power Consumption
- DGS-3324SRi, DGS-3324SR: 90 watts (max.)
- DES-3352SR: 80 watts (max.)
- DXS-3326GSR: 140 watts (max.)
- DXS-3350SR: 143 watts (max.)

Ventilation
- DGS-3324SRi, DGS-3324SR, DXS-3326GSR:
  2 40 x 40 mm DC fans, 1 60 x 60 mm DC fan
- DES-3352SR, DXS-3350SR: 2 40 x 40 mm DC fans

Operating Temperature
0° to 40 °C

Storage Temperature
-25° to 55 °C

Humidity
5% to 95% non-condensing

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

Safety
CSA International

Optional SFP Transceivers	
DEM-310GT	SFP transceiver for 1000BASE-LX, single-mode fiber, max. distance 10km, 3.3V
DEM-311GT	SFP transceiver for 1000BASE-SX, multi-mode fiber, max. distance 550m, 3.3V
DEM-314GT	SFP transceiver for 1000BASE-LHX, single-mode fiber, max. distance 50km, 3.3V
DEM-315GT	SFP transceiver for 1000BASE-ZX, single-mode fiber, max. distance 80km, 3.3V

Optional XFP Transceivers	
DEM-421XT	XFP transceiver for 10GBASE-SR, multi-mode fiber, max. distance 300m, 3.3V/5V
DEM-422XT	XFP transceiver for 10GBASE-LR, single-mode fiber, max. distance 10km,3.3V/5V

Optional Redundant Power Supply	
DPS-500	140-watts redundant power supply
DPS-800	2-slot redundant power supply chassis
DPS-900	8-slot redundant power supply chassis