

# CAPELLIX 3000

## MODULAR SAN SWITCH



### FEATURES

- 3-SLOT MODULAR CHASSIS
- 28 GBPS FIBRE CHANNEL SWITCH ENGINE
- SCALABLE FROM 6 TO 32 PORTS
- GBIC, DB-9, HSSDC, AND DUAL SC CONNECTIVITY OPTIONS
- NATIVE ARBITRATED LOOP DEVICE SUPPORT
- FABRIC CONNECTIVITY (FL PORTS) SUPPORTED
- VENTANA™ SANTOOLS™ MANAGEMENT
- CONNECTIVITY TO NETWORK AND STORAGE MANAGEMENT FRAMEWORKS
- REDUNDANT, HOT-SWAPPABLE POWER SUPPLY AND FAN ASSEMBLY OPTION

## OVERVIEW

Gadzoox® Networks, the market leader in storage area networks (SAN) solutions, introduces the first modular switch for the SAN market, the Capellix™ 3000 modular SAN switch. The Capellix 3000 is a modular platform designed to satisfy the evolving requirements of mission-critical SAN environments. The Capellix 3000 enables the construction of a robust, end-to-end SAN solution through its unmatched flexibility, scalability and ease-of-use.

### CAPELLIX 3000: ENABLING THE SAN EVOLUTION

The deployment of SANs has rapidly extended beyond the direct replacement of SCSI with Fibre Channel. As more servers, operating systems, storage subsystems and software applications become Fibre Channel enabled, SANs become the critical element required to successfully manage the quickly growing data management needs of today's enterprise organizations.

# CAPELLIX 3000

The SAN infrastructure must provide a level of scalability that keeps pace with the evolving requirements of the storage market. The Capellix 3000 offers an unsurpassed level of flexibility and modularity to meet the requirements for a wide range of SAN applications.

## SCALABILITY

The modularity of the Capellix 3000 design provides an ideal platform for building highly scalable SANs. The 3-slot chassis enables you to grow your SAN as your needs grow by offering a choice of GBIC, dual-SC, DB-9, or small form-factor connector plug-in modules (PIMs). By employing PIMs with small form-factor connectors such as the copper HSSDC, the Capellix 3000 switch can be configured for up to 32 ports.

To complement its port scalability, the Capellix 3000 features an integrated 28 Gbps switch engine, which provides the highest bandwidth of any switch in its class (Figure 1). This enables the user to build larger networks without the hidden cost of inter-switch port consumption and performance bottlenecks inherent in network designs using fixed-configuration switches (Fig 3).

Number of Nodes	Number of 8-Port Switches	Number of 16-Port Switches	Number of Capellix Switches
8	1	1	1
16	3	1	1
24	4	2	1
32	5	3	1
40	7	3	2
48	8	4	2
56	9	4	2
64	11	5	2

□ Non-blocking architecture  
■ Blocking architecture

FIGURE 1

*SAN scalability: fixed configuration versus modular designs*

## EASE OF INTEGRATION

Employing standards-based, loop-switch technology, the Capellix 3000 offers quick and easy integration into new and existing SANs. The Capellix 3000 is designed to work with the same Fibre Channel protocol that is supported by all host adapters, RAID controllers and storage subsystems, employing Fibre Channel Arbitrated Loop (FC-AL).

## RESILIENCY

Building on the proven resiliency of Gadzoox embedded management technology, the second generation Reflex™ II Name Server is designed to provide unmatched network stability and network reliability for switched environments. By constantly monitoring and analyzing the status of SAN devices, the Reflex II Name Server detects, isolates and suppresses disruptive events associated with power-cycling, rebooting, device plugging and intermittent link failures. This prevents such events from affecting the throughput of data to and from operational nodes. This intelligent, proactive capability ensures network stability even in the most dynamic environments.



FIGURE 2

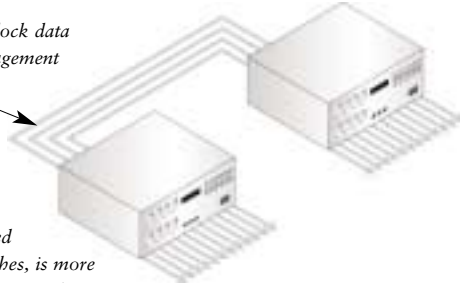
*Plug-in modules offer pay-as-you-grow flexibility to add up to 32 ports and application-specific SAN services, as needed.*

## 24-Node Application

### 16-PORT FIXED CONFIGURATION SOLUTION

*Interswitch links block data flow and add management complexity.*

*A 24-port SAN topology, using fixed configuration switches, is more complex and costly to implement.*



### CAPELLIX 3000 MODULAR SOLUTION

*Capellix' 28 Gbps switch engine enables 24-port, non-blocking SAN topology.*



FIGURE 3

### MANAGEMENT

The Capellix 3000 is managed by Gadzoox Networks' proven SAN management software, Ventana SANtools GX. This basic version of the management software comes preconfigured with every Capellix 3000 switch. Once configured, intelligent agents monitor the health of links, helping systems and network administrators to meet customers' expectations for high levels of service and ensures accessibility to business critical applications.

Ventana SANtools GXS, the optional advanced version of the management software, is a value-added software package for SAN administrators who require an increased level of device management. Ventana SANtools GXS provides the SNMP support required to integrate a Capellix 3000 switch with third-party applications. Ventana SANtools GXS provides snap-in management solutions under the enterprise management framework for Tivoli® NetView®, Novell® Console One™ and Computer Associates® Unicenter TNG®.

### EXTENSIBILITY

The SAN infrastructure must provide a flexible foundation to support increasing storage requirements. In rapidly evolving SAN environments, the slotted chassis design and unique architecture of the Capellix switch provide extensibility, allowing the addition of SAN capabilities as they become available.

Ventana SANtools Management	GX	GXS
FC-AL Support	✓	✓
PIM Support	✓	✓
Reflex II Name Server	✓	✓
Zoning	✓	✓
Telnet	✓	✓
Menu-driven Interface	✓	✓
FC MIB 2.2		✓
Web Management		✓
SNMP		✓
Third-Party Snap-ins		✓

The Capellix 3000 modular architecture enables the support of multiple protocols, link speeds and connector types via upgradeable plug-in modules.

To help ensure extensibility of management capabilities and on-going compliance with standards and frameworks, the architecture of the Capellix switch supports a broad range of downloadable agents. Capabilities such as embedded management, SAN services, MIB extensions, and SAN application APIs can be easily added or upgraded in the field as these standards evolve.

### FLEXIBLE CONFIGURATION OPTIONS

The Capellix 3000 offers a choice of two 3-slot chassis models—a high availability chassis (shown on front) and standard chassis (Figure 2). The high availability model, Capellix 3000HA, is a 3U rack-mountable chassis designed for mission-critical SAN applications. Capellix 3000HA utilizes redundant power supplies and fan assemblies (Figures 4 and 5) that are hot-swappable, allowing scheduled replacement and better system downtime management. The standard model is a 2U, rack-mountable chassis for more space-conscious and cost-effective SAN applications. A modular solution provides pay-as-you-grow capability enhanced by a cost-effective, integrated media solution for storage consolidation or server clustering applications.



FIGURE 4 Model 3001 removable power supplies in Capellix 3000HA



FIGURE 5 Model 3005 removable fan trays in Capellix 3000HA

Application	Capellix 3000 Advantage
<b>Storage Consolidation</b>	<ul style="list-style-type: none"> <li>• Superior scalability of servers and storage devices using the integral 28 Gbps switch engine, modular addition of ports as needed.</li> <li>• Reliable partitioning of servers and storage pools through advanced secure zoning.</li> <li>• Ease of integration with legacy storage subsystems available via FC-AL compliant PIMs.</li> </ul>
<b>Storage Management</b>	<ul style="list-style-type: none"> <li>• LAN-free backup, restore, mirroring and vaulting of data.</li> <li>• Downloadable Java applets and management agents provide a foundation for emerging SAN framework initiatives.</li> <li>• Conforms with IETF MIB standards for SNMP management.</li> </ul>
<b>Clustering</b>	<ul style="list-style-type: none"> <li>• Consolidates server-to-server messaging and server-to-storage I/O connections in high availability cluster environments.</li> </ul>

The modular design of the Capellix 3000 allows it to be configured for a wide variety of SAN applications and services through the use of plug-in modules (PIMs). The DB-9, and dual-SC connector PIMs (Figure 6, middle) enable the configuration of an 8-, 16- or 24-port switch with copper and/or optical media. Users can pre-configure Capellix, or field-install the PIMs in 8-port increments as the storage network grows.

For applications requiring higher port counts, the smaller form-factor HSSDC PIM (Figure 6, bottom) offers 12 ports per module. These plug-in modules enable the Capellix 3000 to be configured with up to 32 ports.

The 6-port GBIC PIM (Figure 6, top) provides the additional flexibility to configure the switch for varying cable media on a port-by-port basis. The GBIC plug-in module supports insertion of any combination of copper, short-wave optical, and longwave optical GBICs for connections up to 80 kilometers. The GBIC PIM can be used in combination with fixed copper or shortwave optical modules to optimize port density. GBICs also offer cost-effective attachment of local devices while retaining flexibility to add longwave connectivity to storage resources up to 80 km away for remote mirroring, backup, or data warehousing applications.



FIGURE 6

3110 GBIC (top), 3120 DB-9, 3130 Dual-SC  
and 3140 HSSDC PIMs

## TECHNICAL SPECIFICATIONS

### FUNCTIONAL SPECIFICATIONS:

SWITCH ENGINE : 28 GBPS, INTEGRAL TO THE CHASSIS  
 COMMUNICATIONS MODES: FULL DUPLEX, DIPLEX  
 DATA TRANSFER LATENCY: <500 NANOSECONDS, 280 NANOSECONDS TYPICAL  
 NUMBER OF PIM SLOTS: 3  
 PROTOCOLS SUPPORTED: FC-AL, FC-AL-2, FC-PH, FC-PH-2, FC-PH-3, FC-PLDA, FCP  
 MANAGEMENT ACCESS: LOCAL CONSOLE VIA RS232, SNMP VIA 10BASE-T, TELNET  
 MANAGEMENT INTERFACE: ASCII VIA RS232, VENTANA SANTOOLS VIA 10BASE-T  
 MANAGEMENT STANDARDS: IETF FIBRE CHANNEL MANAGEMENT MIB

### CHASSIS PHYSICAL SPECIFICATIONS:

MODEL 3000HA: 3U, RACKMOUNTABLE  
 H)5.2IN/132MM W)17.3IN/439MM D)18.5IN/469MM  
 WEIGHT: NET - 30.9LBS (14.0KG)  
 MODEL 3000: 2U, RACKMOUNTABLE  
 H)3.4IN/86MM W)17.3IN/439MM D)18.5IN/469MM  
 WEIGHT: NET - 18.5LBS (8.4KG)

### CHASSIS ELECTRICAL SPECIFICATIONS:

MODEL 3000HA: AC VOLTAGE: 100-240 VAC, 50-60 HZ  
 POWER SUPPLY: (2) 1.5A, 200W, REDUNDANT, HOT SWAPPABLE  
 MODEL 3000: AC VOLTAGE: 100-240 VAC, 50-60 HZ  
 POWER SUPPLY: (1) 3A, 200W, FIXED

### PIM OPTIONS:

MODEL 3110: 6-PORT GBIC 1GB/S FIBRE CHANNEL SWITCH PIM  
 MODEL 3120: 8-PORT DB-9 1GB/S FIBRE CHANNEL SWITCH PIM  
 MODEL 3130: 8-PORT DUAL SC MULTI-MODE 1GB/S FIBRE CHANNEL SWITCH PIM  
 MODEL 3140: 12-PORT HSSDC FIBRE CHANNEL SWITCH PIM

### ENVIRONMENTAL SPECIFICATIONS:

OPERATING TEMPERATURE: +10°C TO +40°C  
 STORAGE TEMPERATURE: -30°C TO +60°C  
 OPERATING HUMIDITY: 20% TO 80% NON-CONDENSING

### SAFETY COMPLIANCE:

UL: UL 1950, 1995, 3RD EDITION  
 CSA: CSA C22.2 NO. 950-95, 3RD EDITION  
 TUV: EN 60950:1992 A1, A2:1993, A3:1995, A4:1997  
 CB SCHEME: CB BULLETIN NO. 86A1

### EMC COMPLIANCE:

CE EMISSIONS REQUIREMENTS: EN55022:1994 (CISPR 22, CLASS A)  
 CE IMMUNITY REQUIREMENTS: EN50024:1998 (CISPR 24, MODIFIED)  
 FCC EMISSIONS (USA): CFR 47, PART 15, SUBPART B, CLASS A  
 CANADIAN REQUIREMENTS: ICES-003, CLASS A  
 VCCI CERTIFICATION: VCCI, CLASS A  
 AUSTRALIAN/NEW ZEALAND: AS/NZS 3548/95 CLASS A

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