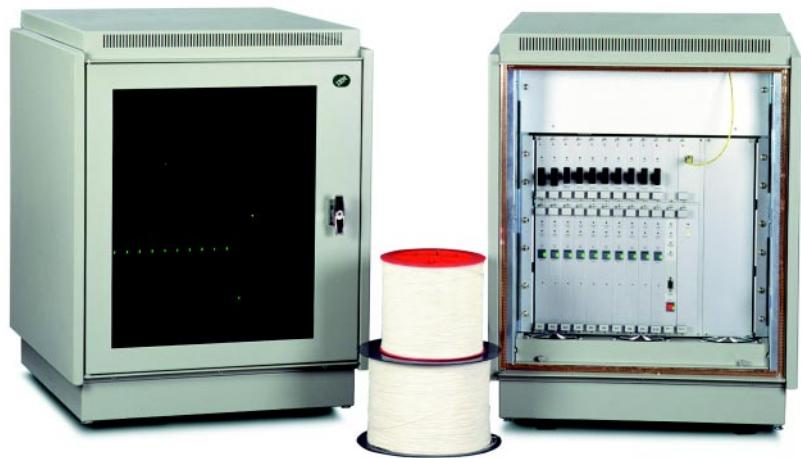*New light on site interconnectivity*

PRODUCT UPDATE

IBM 9729 Optical Wavelength Division Multiplexer

• **Lower connectivity costs plus protocol transparency**

• **Flexibility of two models**

• **Full support for Parallel Sysplex processing**

• **Disaster backup and recovery**

• **High availability**

• **New forms of inter-site traffic**

Data Comm
M A G A Z I N E
Hot Products

The IBM 9729 Optical Wavelength Division Multiplexer Model 001 provides up to 10 full-duplex (FDX), protocol-transparent, high-speed connections over a single fiber. Maximum distance and channel speed are 50 km (31 mi.) and 1 Gbps, respectively, depending on the device attached. The 9729 Model 041 provides up to four of these FDX connections, with the flexibility to upgrade to Model 001 in the future.

Positioning and Benefits

**Problem: Building a Parallel Sysplex configuration**

Environment: The hosts at each site require fiber links to each Coupling Facility, Sysplex Timer® and ESCON® connection, which might be cost-prohibitive.

1. *Coupling Facility (9674)*

2. *Host*

3. *Sysplex Timer (9037 Model 2)*

4. *ESCON Director (9032)*
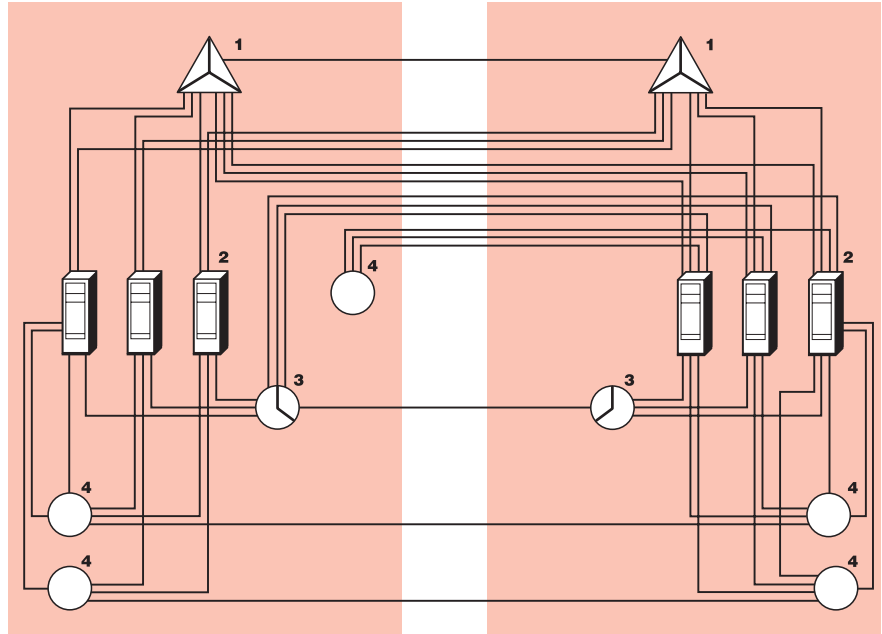
Solution: Fiber cost reduction by adding 9729s at each site.

1. *IBM 9729*

2. *Coupling Facility (9674)*

3. *Sysplex Timer (9037 Model 2)*

4. *ESCON Director (9032)*

5. *Host*
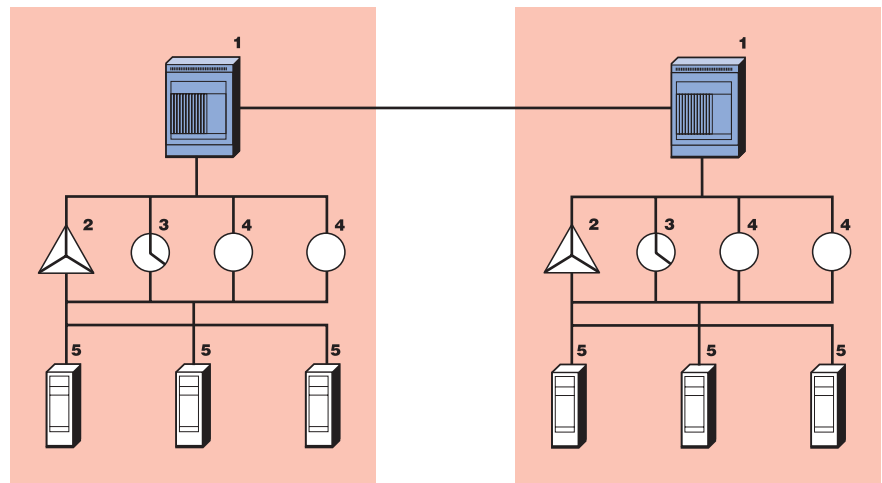
Benefits
- Full Parallel Sysplex support
- Lower fiber costs

## Problem: A need for reliable backup and recovery

Environment: Other fiber link solutions may make separation of DASD cost-prohibitive, forcing all DASD to be placed in the same location. A disaster at that single location potentially affects all DASD.

1. *Host*

2. *Disk controller*

3. *IBM 3390*

4. *Fiber link*
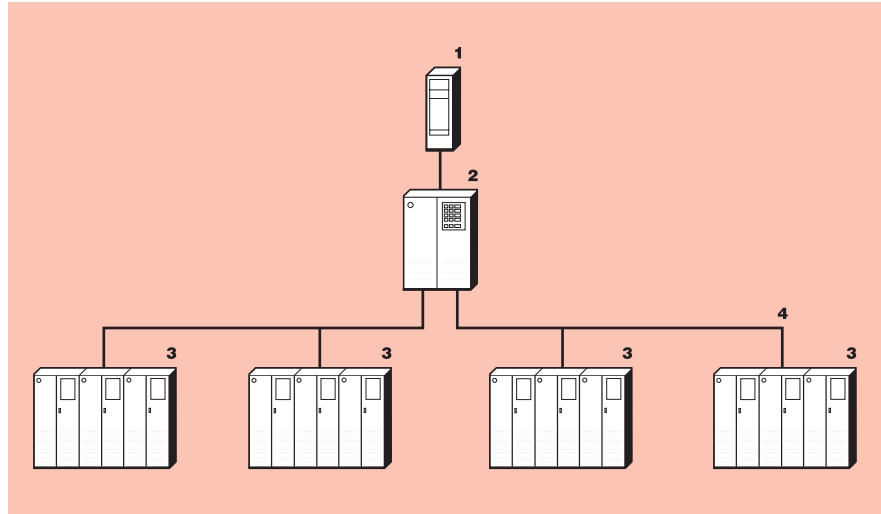
Solution: The 9729's reduction in fiber cost enables resource separation, which can reduce the scope and impact of a disaster with the capability to link locations up to 50 km (31 mi.) apart. Distances are determined by end devices' characteristics.

1. *Host*

2. *Disk controller*

3. *IBM 3390*

4. *IBM 9729*
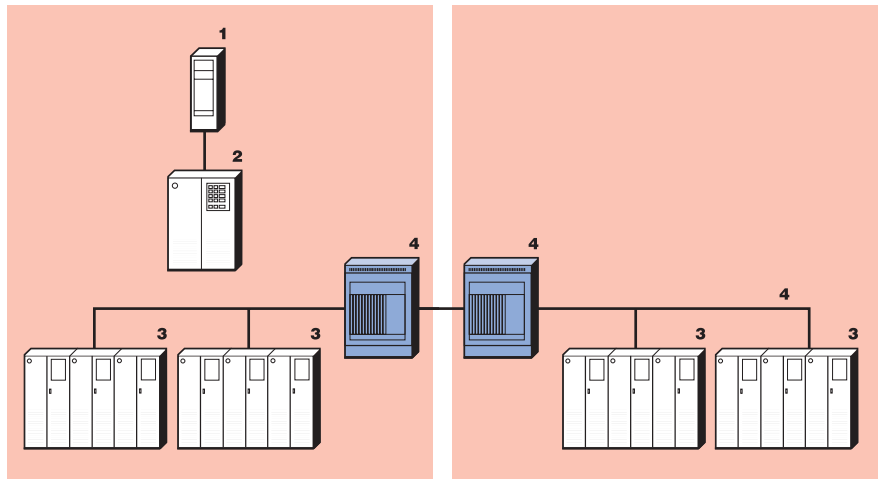
Benefits
- Cost-effective disaster recovery across multiple sites
- Economical separation of your storage center from your computing center

Product Overview

Lower connectivity costs plus protocol transparency

Now you can cost-effectively expand your network to include remote locations up to 50 km (31 mi.) apart. Instead of having to rent a pair of fibers for every 2-way connection between sites, you can get up to 10 of these connections simultaneously, all on a single fiber. You can use the connections for ESCON, Sysplex Timer, Coupling Links, OC3, Fast Ethernet and FDDI traffic independently on up to 10 different 2-way connections. The 9729 adapters accept your data formats and transport the data without translations.

The 9729 enables up to 10 FDX channels to be transmitted over a single fiber by using a technique called wavelength division multiplexing. This technique allows the 9729 to divide the bandwidths of the optical cable into a unique spectrum for each channel without any interference between channels. That means data from multiple channels can be sent simultaneously through a single fiber, regardless of differences in format — a feature not possible using technology prior to wavelength division multiplexing.

Flexibility of two models

The 9729 is available in two models. Model 001 can divide a single optical fiber line into as many as 20 wavelengths and provides dual, fully redundant power and cooling. Model 041 can divide a line into as many as eight wavelengths; redundant power is optional.

Full support for Parallel Sysplex processing

The 9729 fully supports all aspects of the Parallel Sysplex environment, including ESCON channels, the 9037 Sysplex Timer Model 2 and the 9674 Coupling Facility.

Parallel Sysplex processing enables you to implement high-performance data sharing and workload balancing across multiple processors, while simultaneously optimizing disaster recovery.

With the 9729 you can now include processors separated by as much as 40 km (24.8 mi.) in the same Parallel Sysplex environment.

The modularity of the 9729 allows you to implement features of the Parallel Sysplex independently, so you can have the solution you need today and add features to implement the solutions you need for tomorrow.

Disaster backup and recovery

The 9729 also helps you to provide data backup and disaster recovery, regardless of your environment, and is an excellent enhancement for remote copy solutions. The 9729 allows you to economically separate your storage center from your computing center. Your remote copy traffic — synchronous or asynchronous — can be channeled through the 9729. And, if required, remote tape vaulting and/or remote printing can be implemented.

High availability

Protection switching for the 9729 is provided by the dual-fiber I/O adapter. If communication on the primary link is broken, the 9729 detects the loss of light and can automatically switch over to the secondary path, helping to ensure that your link remains available.

The 9729 also features redundant power and cooling units, helping to ensure that your 9729 remains available.

New forms of inter-site traffic

The 9729 supports connections for ESCON, Coupling Links, Sysplex Timer, FDDI, OC3 and Fast Ethernet and connection to these interfaces is easy. For ESCON, FDDI and Coupling Links, a different front-panel connector is provided on the plug-in adapter. For OC3 the connection is made through an ESCON adapter with a customer-provided cable, and for Fast Ethernet the connection is made through a FDDI adapter with a customer-provided cable. There are up to 10 slots available for these adapters, and you can have any combination of them that's right for your communication needs. You don't have 10 channels? That's OK — the 9729 offers modular solutions: whether you invest in a Model 041 (supporting a maximum of 4 FDX channels) or in a Model 001 (supporting a maximum of 10), you can install the number of adapters you require now and add more later as your need grows.

The 9729 enhances existing network operations and enables establishment of remote sites — at distances of up to 50 km (31 mi.) — at competitive prices. You can now provide cost-effective disaster recovery across multiple sites, maintain a dim or lights-out mode of operating a remote data center and gain flexibility that may be required for contemplated mergers, splits or other reorganizations affecting your network structure.

Benefits

- Fiber cost reduction: Multiplexes up to 20 lightwaves providing up to 10 FDX channels on a single fiber, 1 Gbps per channel and 50-km (31-mi.) link distance.

- Protocol transparency: Supports multiple protocols in any combination — ESCON; Sysplex Timer (ETR); OC3 through an ESCON adapter; FDDI and Fast Ethernet through a FDDI adapter; and Coupling Link connectivity.

- Full Parallel Sysplex support: Fully supports all aspects of the Parallel Sysplex environment — ESCON channels, Sysplex Timer and Coupling Facility.

- Flexibility: Provides modular configuration with 10 slots available in Model 001 and 4 slots in Model 041. Supports a field upgrade of Model 041 to 001.

- High availability: Supports automatic or manual backup fiber for link connection with the dual-fiber I/O card and provides redundant power and cooling units.

9729 Optical Wavelength Division Multiplexer Specifications

Maximum number of FDX channels per model	Model 001: 10 channels Model 041: 4 channels
Options for type of FDX channel	ESCON (200 Mbps), Coupling Links (1 Gbps), Sysplex Timer (16 Mbps), FDDI (100 Mbps), OC3 (155 Mbps), Fast Ethernet (100 Mbps)
Hardware supported	All systems supporting ESCON, Sysplex Timer, Coupling Links, FDDI, Fast Ethernet and OC3 protocols
Network management	SNMP subagent (0S/2, Windows 95, Windows NT) via attached PC
Availability	• Dual-fiber I/O adapter provides protection switching access to secondary fiber path • Redundant power and cooling are standard on Model 001 • Redundant power is optional and redundant cooling is standard on Model 041
Maximum link distance	50 km (31 mi.) at 200 Mbps, single-mode fiber at 15-dB loss 40 km (24.8 mi.) at 1 Gbps, single-mode fiber at 12-dB loss
Operating environment	Temperature ranges: Shipment: 10° to 52°C (50° to 125°F) Storage: 10° to 52°C (50° to 125°F) Operating: 10° to 40°C (50° to 104°F)
Operating wavelengths	1540 to 1559 nm in 1-nm increments

Physical specifications	Width: 600 mm (23.6 in.)
	Depth: 645 mm (25.4 in.)
	Height: 775 mm (30.5 in.)
	Weight: 109 kg (240 lb) for a fully configured Model 001
	     91 kg (200 lb) for a fully configured Model 041 with a single power system
	     102 kg (225 lb) for a fully configured Model 041 with a redundant power system

Electrical service	110 V ac, 50 to 60 Hz at 6 A, or 200 to 240 V ac at 4 A

9729 base		**Model 001 FC**	**Model 041 FC**
Type A Unit Indicator		0100	0100
Type B Unit Indicator		0200	0200
Base Unit with 115 V		1000	1040
Base Unit with 240 V		1001	1041
Grating Assembly		3040	3041

Control cards		**Model 001 FC**	**Model 041 FC**
Diagnostic Card	EIA 232 connection for remote management and diagnostics	3031	3031
TEC2 Card	Temperature control card	3033	3033

Laser receiver cards		Model 001 FC	Model 041 FC
Laser Card A1	For channel 1 of a Unit A	3001	3001
Laser Card A2	For channel 2 of a Unit A	3002	3002
Laser Card A3	For channel 3 of a Unit A	3003	3003
Laser Card A4	For channel 4 of a Unit A	3004	3004
Laser Card A5	For channel 5 of a Unit A	3005	N/A
Laser Card A6	For channel 6 of a Unit A	3006	N/A
Laser Card A7	For channel 7 of a Unit A	3007	N/A
Laser Card A8	For channel 8 of a Unit A	3008	N/A
Laser Card A9	For channel 9 of a Unit A	3009	N/A
Laser Card A10	For channel 10 of a Unit A	3010	N/A
Laser Card B1	For channel 1 of a Unit B	3021	3021
Laser Card B2	For channel 2 of a Unit B	3022	3022
Laser Card B3	For channel 3 of a Unit B	3023	3023
Laser Card B4	For channel 4 of a Unit B	3024	3024
Laser Card B5	For channel 5 of a Unit B	3025	N/A
Laser Card B6	For channel 6 of a Unit B	3026	N/A
Laser Card B7	For channel 7 of a Unit B	3027	N/A
Laser Card B8	For channel 8 of a Unit B	3028	N/A
Laser Card B9	For channel 9 of a Unit B	3029	N/A
Laser Card B10	For channel 10 of a Unit B	3030	N/A
Blank Laser Receiver Card	Placeholder card	3039	3039

I/O cards		Model 001 FC	Model 041 FC
FDDI Card	For FDDI and Fast Ethernet device attachment	3034	3034
ESCON Card	For ESCON, OC3 and ETR attachment	3035	3035
Coupling Links Card	For Coupling Link and HiPerLinks attachment	3050	3050
Fiber I/O Card	For link connection	3036	3036
Dual-Fiber I/O Card	For switching to a backup fiber link	3037	3037
Blank I/O Card	Placeholder card	3038	3038

Accessories		Model 001 FC	Model 041 FC
Ship Group	Publications, SNMP agent	1002	1002
Location Group	Maintenance tools and extender card (one per location)	1003	1003
Redundant Power		N/A	1004

Wide Area Switch

Access and Transport

Key Customer Benefits

- Meets needs for data-center backup and recovery and Parallel Sysplex implementation.
  Can benefit:
  - Customers with multiple sites within 50 km (31 mi.) that require data-center connectivity, disaster backup and recovery, remote DASD or tape connectivity, Parallel Sysplex implementation, LAN interconnections supporting OC3, FDDI or Fast Ethernet traffic. Distances are determined by the connected end devices.
  - Geographies with expensive or limited availability of single-mode or dark fiber.
  - Service providers that have an objective to provide a total solution that includes fiber and multiplexers.
  - Companies merging or splitting their network structures.
  - Companies that offer disaster recovery services.

- Provides high reliability (fault-tolerant hardware, no software) and protocol transparency.

- Offers total solutions when local service providers (Telco, cable companies) are engaged.

Supplementary Information

The following information is available for the 9729:

- Specification sheet:
  IBM 9729 Optical Wavelength Division Multiplexer, G224-4528

- *Bank of Austria Application Brief*, GA33-0402

- Information on the 9729 is available at:
  www.networking.ibm.com/netprod.html
  www.networking.ibm.com/279/279prod.html