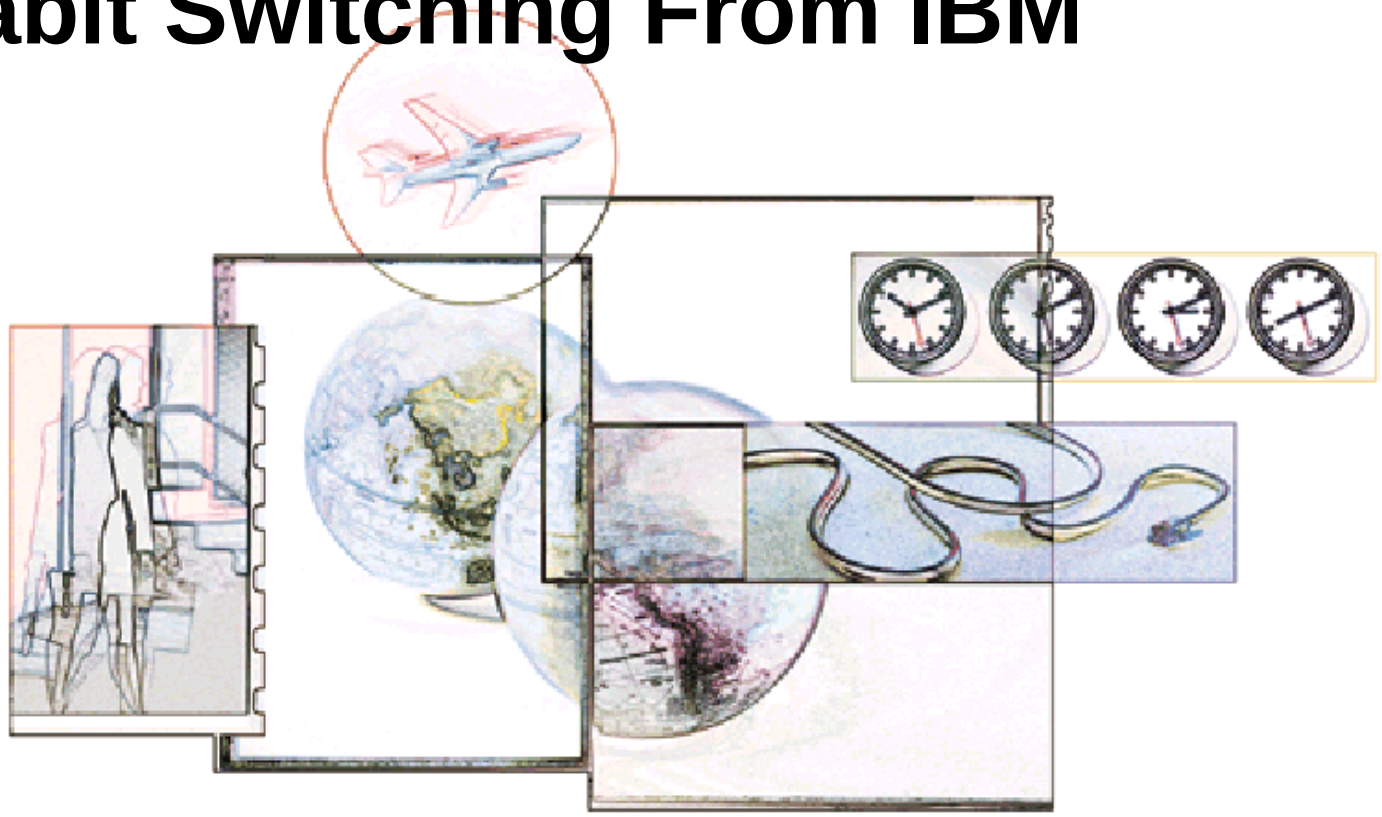
8274 GRS Overview and Directions

Gigabit Switching From IBM

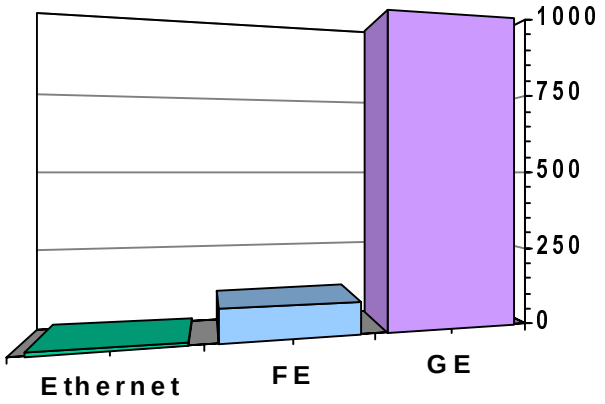


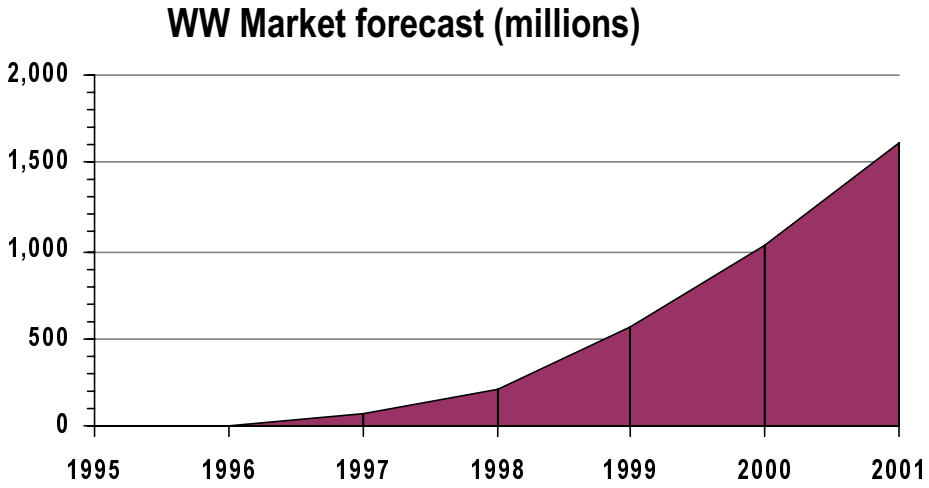
Agenda

- Understanding gigabit networking
- IBM's Gigabit RouteSwitch
- GRS product family
- GRS rollout
- GRS architecture

Understanding gigabit networking

It's a big jump in capacity...

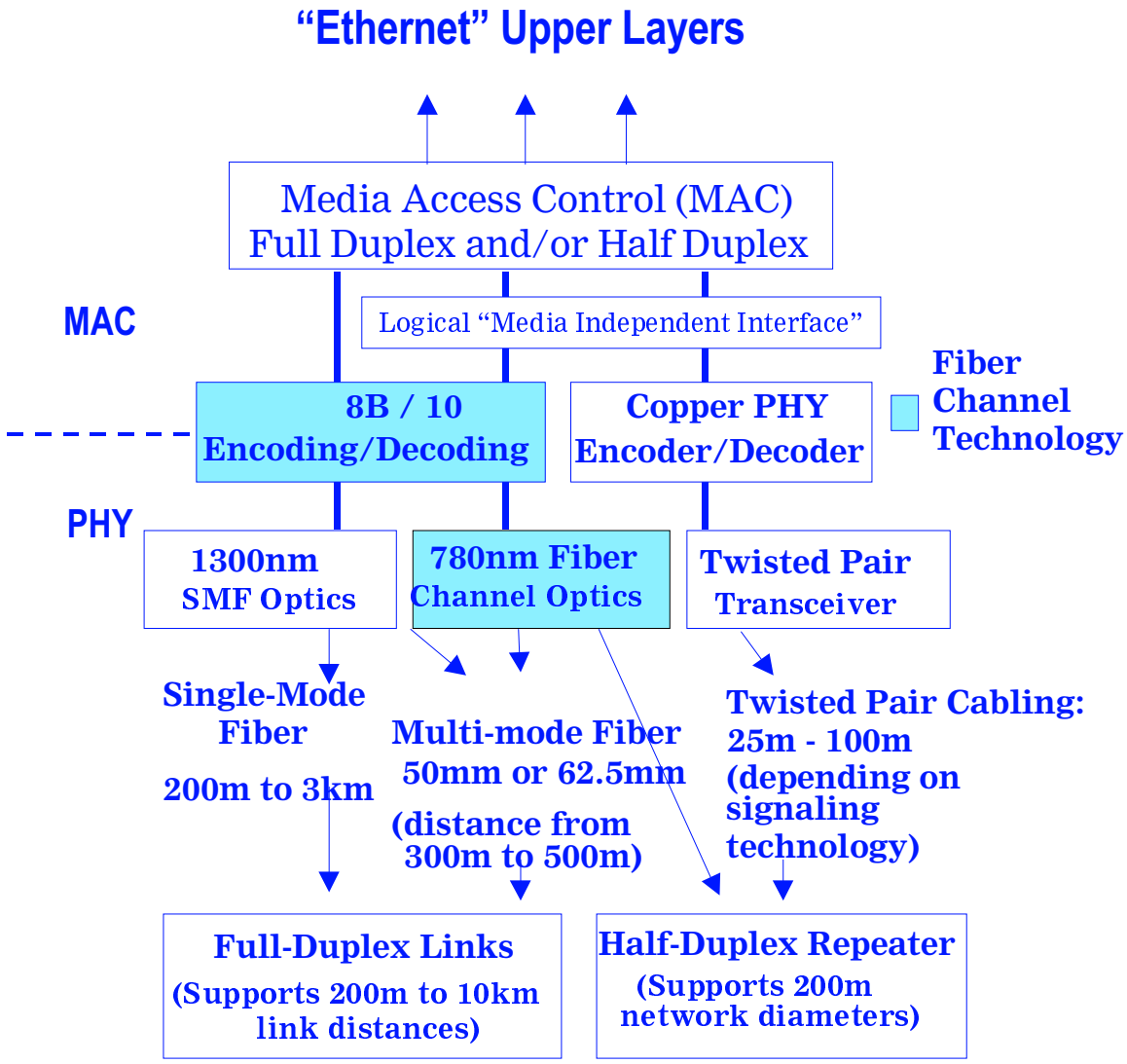




...it's expected to be rapidly deployed...

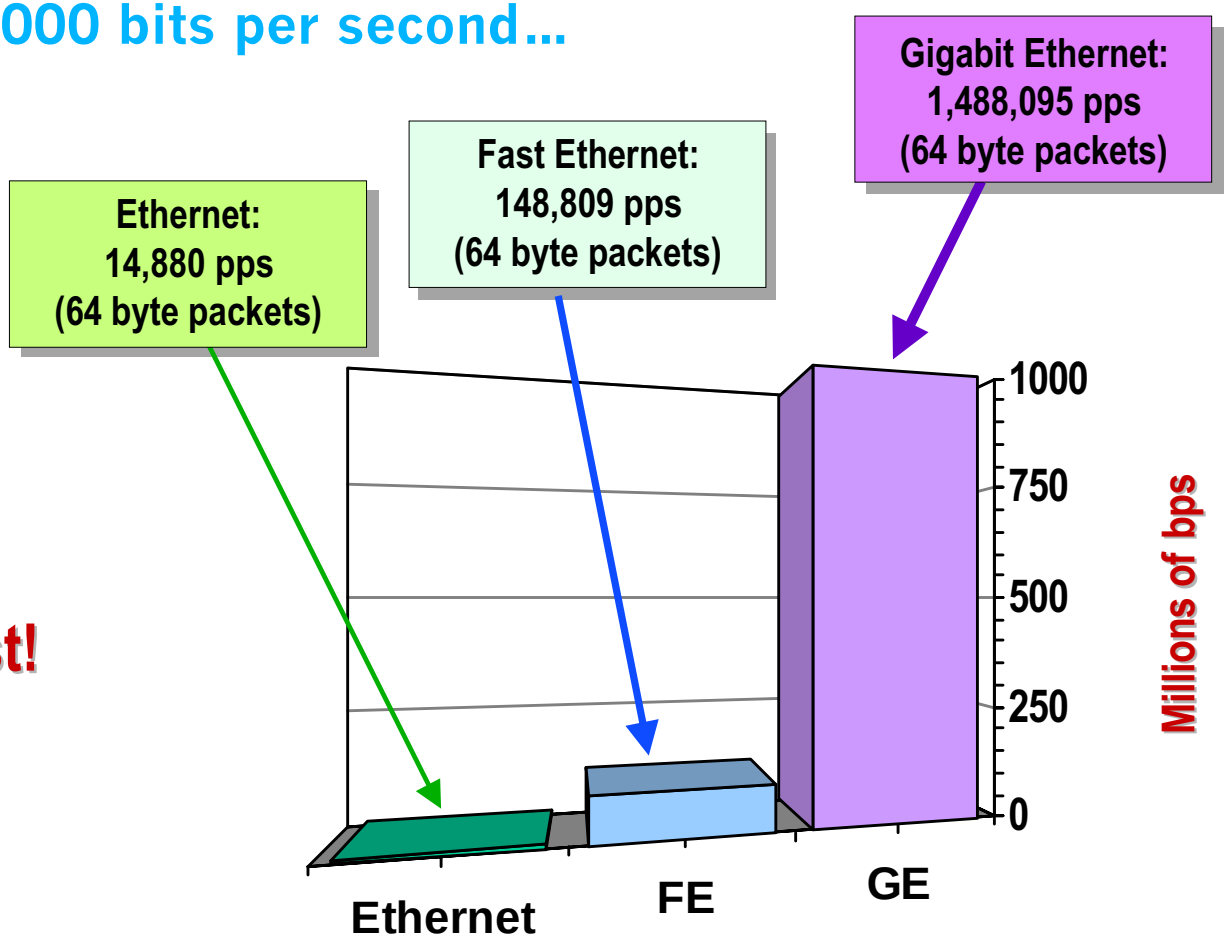
What is Gigabit Ethernet?

- Standard for Ethernet at 1 gigabit per second
- Main standard is 802.3z
- Same IEEE 802.3 frame format
  - Variable length packets 64-1512 bytes



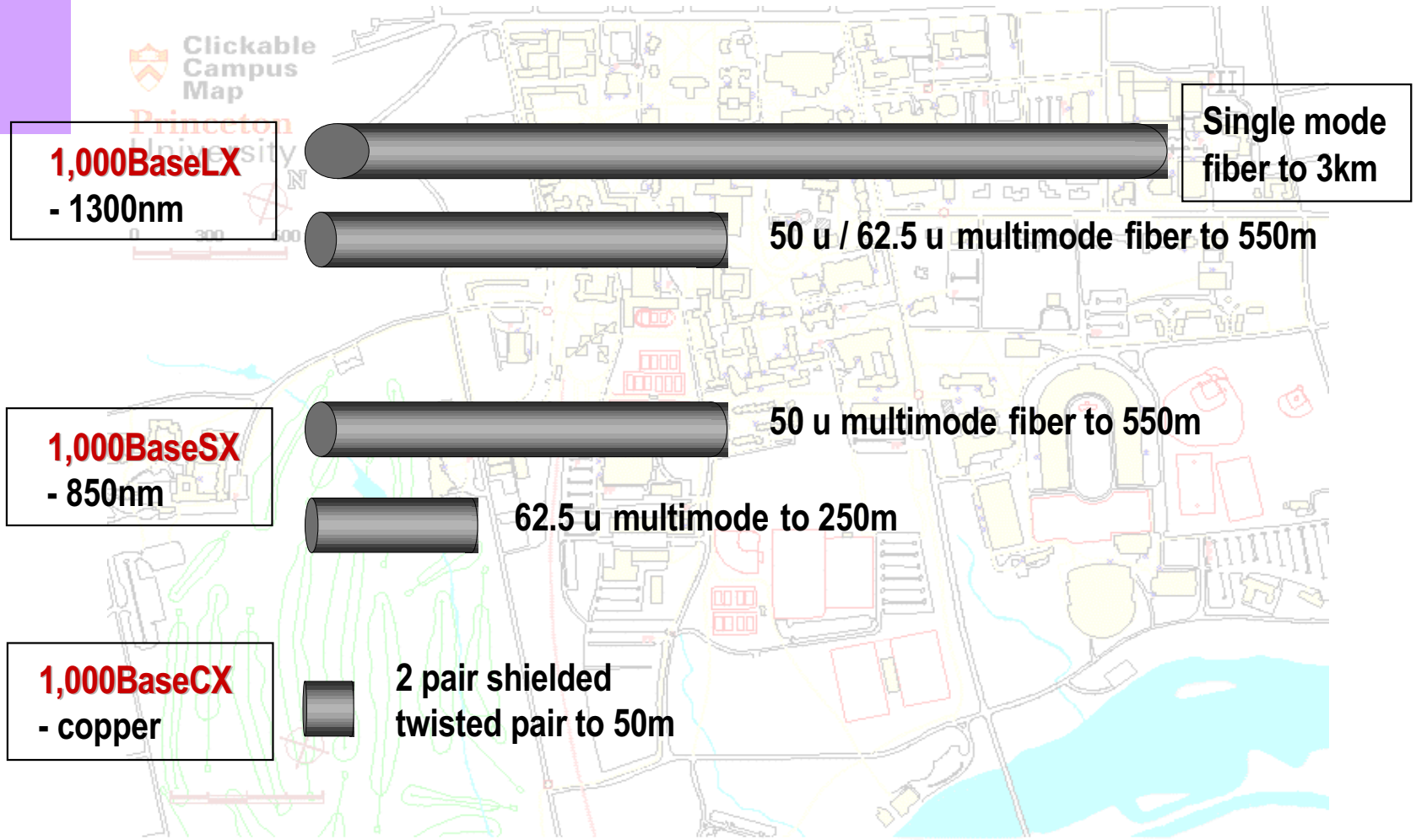
How fast is a gigabit?

1,000,000,000 bits per second...

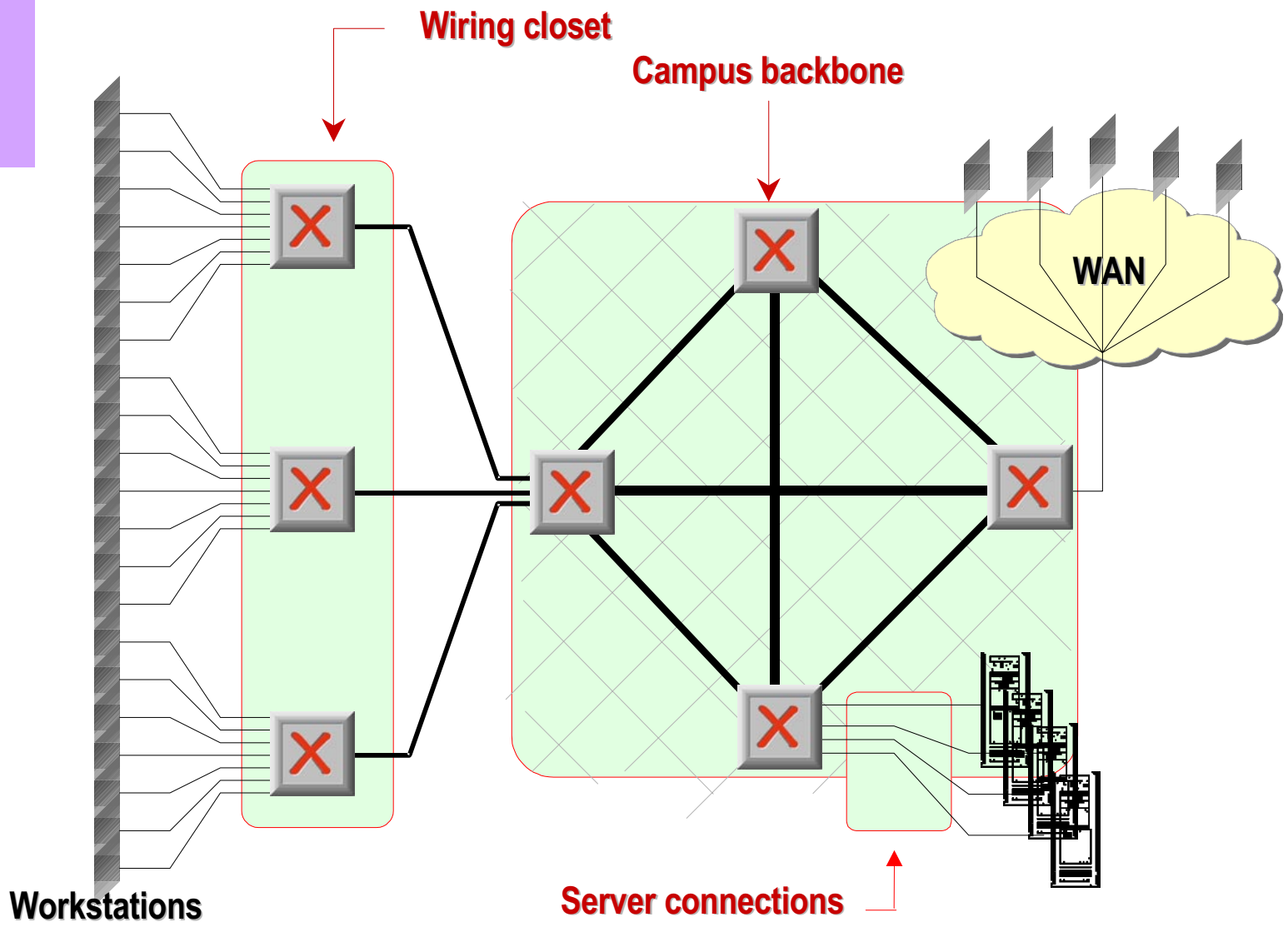


...it's fast!

Gigabit distances & cabling



Where does gigabit go?



Gigabit Ethernet vs. ATM: the real story

Comparisons often made on price per port

Gigabit Ethernet is 1000 Mbps. A fat pipe solves a lot of problems.....but not all!

ATM, while more complex, offers additional traffic management, guaranteed QOS rather than best effort delivery, more resilience and redundancy, better scalability,

...the real story (cont'd)

Some rules of thumb:

- Desktops are pretty much 10/100 Ethernet
- Server connections tend to follow backbone choice
- For the backbone:
  - ➡ If all you need is capacity, Gigabit Ethernet is simplest
  - ➡ Guaranteed QoS for real-time video and voice is stronger with ATM today

Some things to consider:

- Reliability
- Routing Support
- Price/Performance
- Big bandwidth and managed bandwidth are both important
- Complexity, Resilience
- Scalability
- WAN Integration

Gigabit vs.. ATM

	Gigabit	ATM
Cost	B	C
Familiarity	A	C
Standards maturity	B	B+
QoS support	?	A
Ethernet desks	A	B
Token Ring desks	D	B
WAN Integration	?	A

How much is gigabit going to cost me?

Technology	1996	1998	% change
Shared Fast Ethernet	$137	$102	-25%
Switched Fast Ethernet	$785	$500	-36%
Shared FDDI	$835	$680	-19%
Switched FDDI	$4000	$3200	-20%
ATM 622	$6600	$4200	-36%
Switched Gig Ethernet (mm fiber)	N/A	$2800	

* Source: Dell'Oro Group

Gigabit Switch competition is out there...

3Com	Corebuilder 9000
Bay Networks/Nortel	Accelar 1200
Cabletron	Smartswitch Router 8600
Cisco	Catalyst 5500/8500
Compaq	Digital GIGA Switch/Router
Extreme Networks	Black Diamond 6800
Foundry Networks	BigIron 8000
Lucent	Cajun Switch
ODS	LANblazer 7000
Packet Engines/Alcatel	PowerRail 5200 Enterprise Routing Switch
Plaintree Systems	Waveswitch 9200
XLNT	Milennium 4000+

IBM's Gigabit RouteSwitch

STOP…!

Let's not think just "Gigabit Ethernet"…

Wouldn't it be good if a switch supported excellent Gigabit Ethernet connectivity…

BUT, had equally strong support for Ethernet, Token Ring, ATM.....

AND supported Backbone class L3 Switching

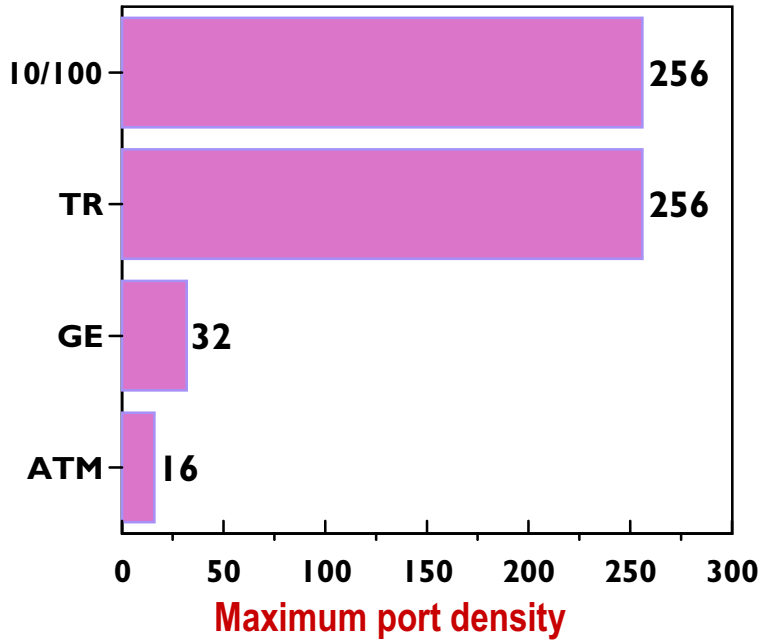
AND supported the integrated services intelligence of IBM's 8274...

Positioning the GRS

GRS is a high-capacity Gigabit switch

- ✓ 22Gbps switching fabric
- ✓ 1.5-12MPPS layer 3 switching
- ✓ Up to 19 RISC processors
- ✓ Up to 61 switching ASICs
- ✓ Up to 32 Gigabit Ethernet Ports
- ✓ Up to 256 10/100 Ethernet ports
- ✓ Up to 256 4/16 Token Ring ports

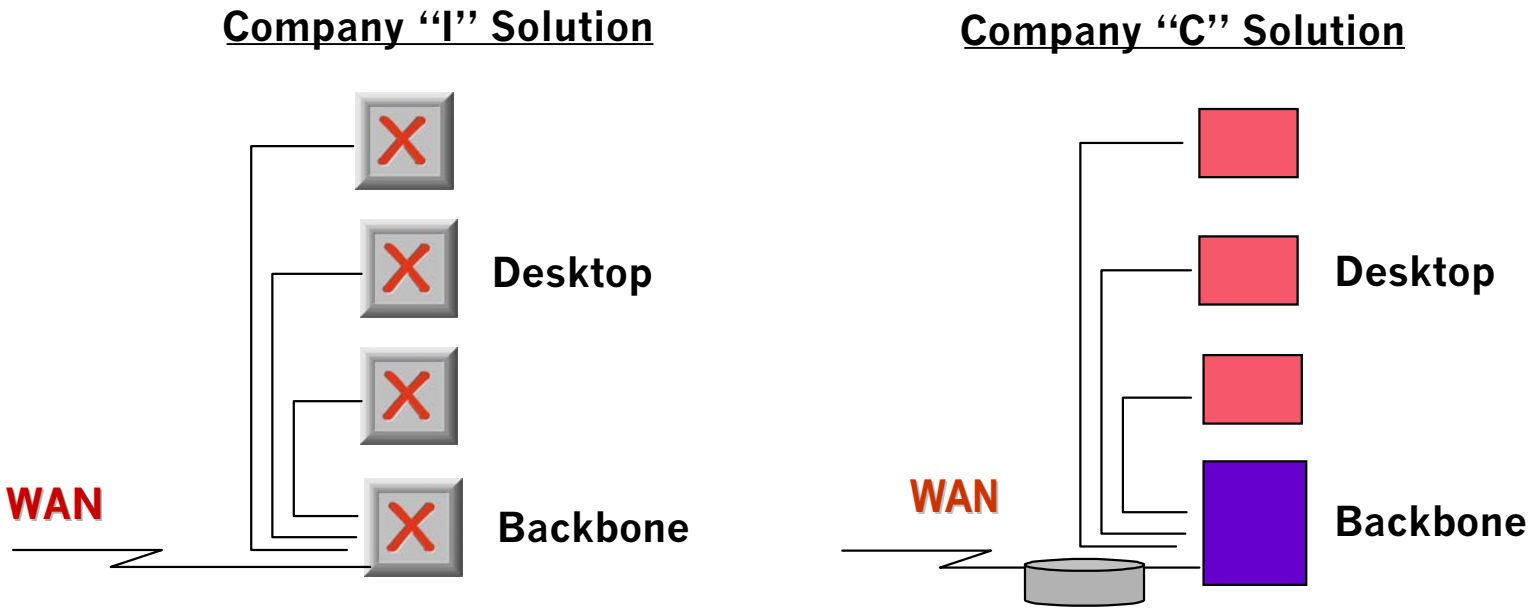
GRS is a complete switching solution



Positioning the GRS

One switch for complete solutions

- one family of software/features to learn (and it's common with the 8274/8277
- one management platform to operate
- one box solution which can migrate with a customer's requirements



Positioning the GRS

Where to sell the GRS

- for Gigabit Ethernet backbones
- in the wiring closet
  - ➡ high density 10/100
  - ➡ high density token ring
  - ➡ highly subnetted environment

Where to **Not** to sell the GRS

- low cost 10/100 switching only: sell stackables: 8275/8271
- mixed ATM cell and frame switching solutions: sell 8265/8371

Positioning the GRS

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Wherever you sell the 8274!

Where to Not to sell the GRS

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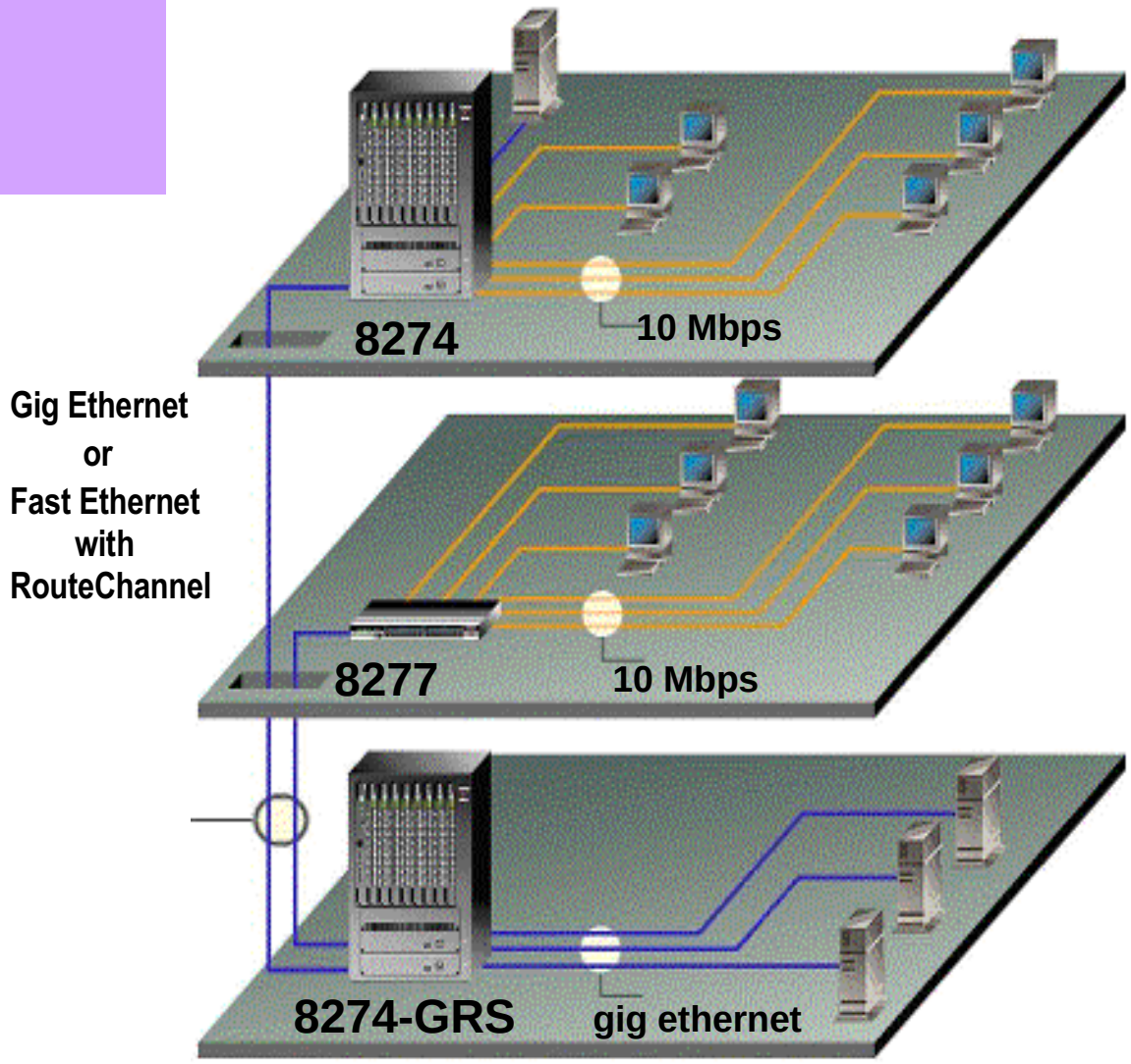
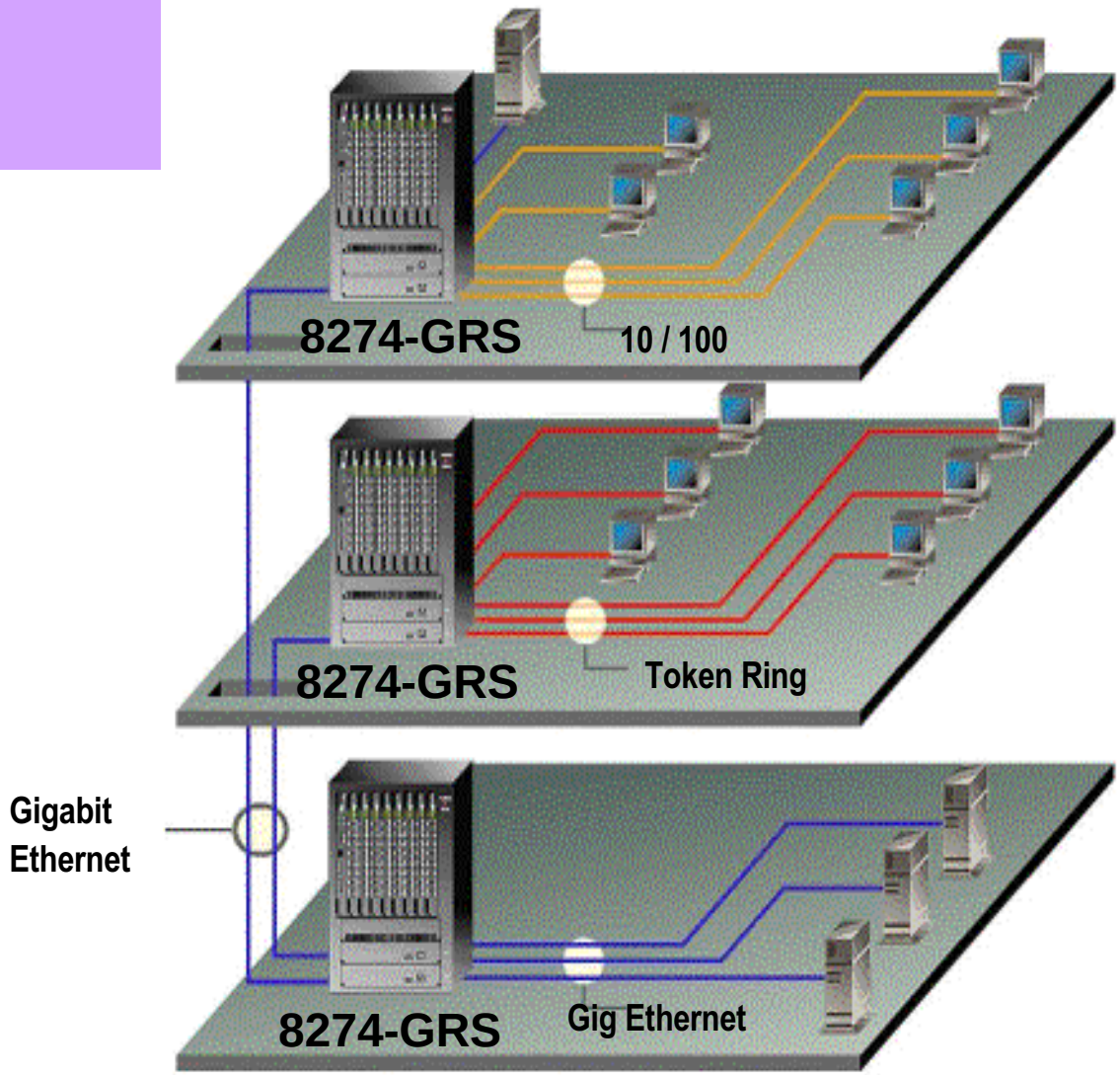
Positioning the GRS: The backbone



Features

- high switching capacity
- extensive routing capabilities
- Backbone Network Services
  - **DHCP, DNS, NAT, etc.**

Positioning the GRS: The wiring closet



Features

- low cost
- high-speed switching fabric
- flexibility
- Desktop Network Services
  - **QoS, Multicast, VLANs**

Positioning the GRS

Against the 'Big Four"

- speed
- price
- a complete one box solution

Against the Gigabit startups

- over 1 million switch ports installed
- breadth of interfaces
- mature software and features

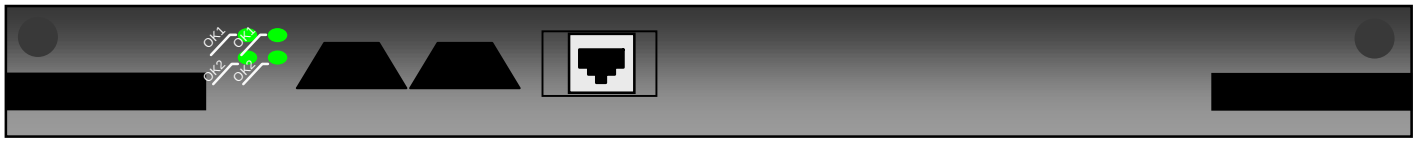
8274 GRS Product Family

Common equipment

- 9-slot chassis (similar to 8274), plans for 5-slot version
- 650W power supply
- management module - MPX
- Layer-3 routing engine - HRE-X
- high-speed backplane - 22Gbps
- Redundant power supply support
- hot-swap module support

MPX

Management Processor Module for GRS



Features:

- standard 32M DRAM & option for up to 128M
- standard 8M flash & option for up to 32M
- supports redundancy mode
- layer-3 switching capable through optional daughter card (HRE-X)
- high-speed processing with optional co-processor

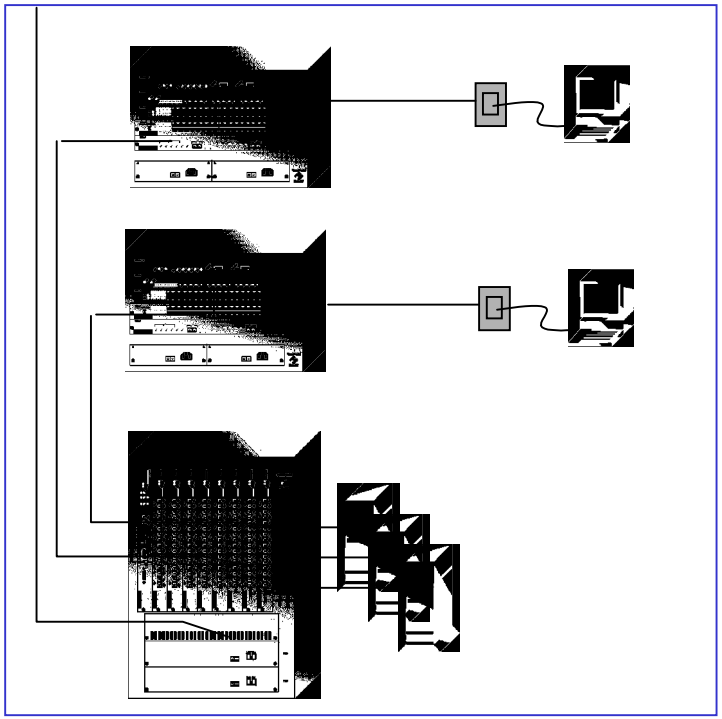
HRE-X

Hardware Routing Engine for GRS

Features:

- IP and IPX, RIP, RIP II, OSPF, IP Multicast, DHCP Relay support
- 1.5M to 12Million Packets Per Second
- One HRE-X on MPX, or one HRE-X per blade
- ISP-class table size
  - **256,000 route entries**
  - **64,000 next-hop destinations**

Application



GRS product family

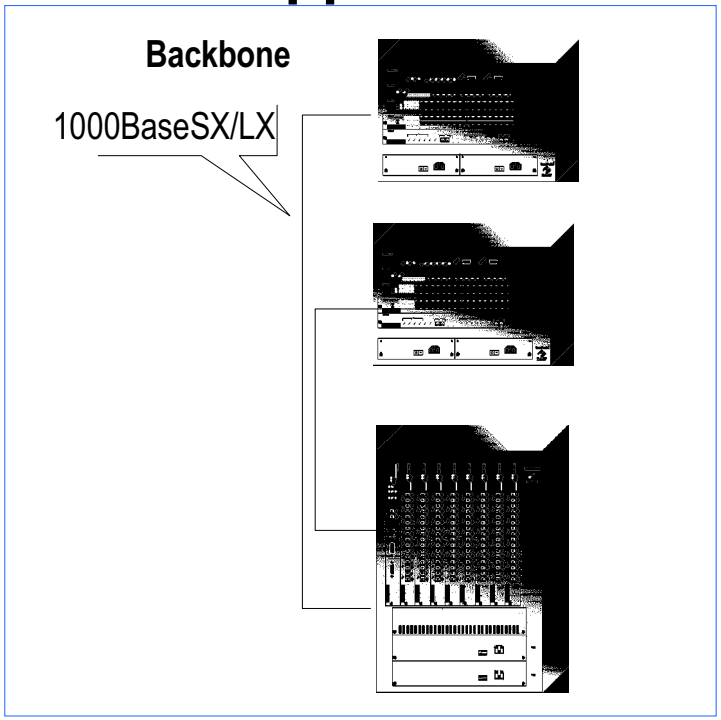
Modules in first release:

- 2-port backbone Gigabit Ethernet (MMF or SMF)
- 4-port Gigabit Ethernet (MMF)
- 12-port backbone 10/100BaseTX Ethernet
- 32-port desktop 10/100BaseTX Ethernet
- 12-port backbone 100Base-FX
- 16-port desktop or MAU 4/16 token ring
- 32-port desktop 4/16 token ring
- 1-port ATM OC-3

GSX-FM/FS-2W

High-performance Gigabit switch module for GRS

Application



Features:

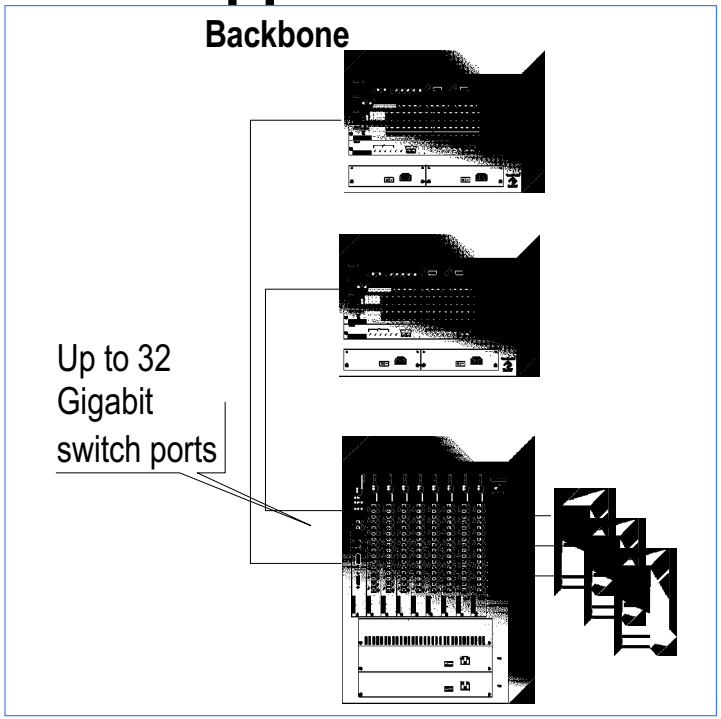
- single mode and multi-mode options
- standards-compliant to 1000BaseSX and 1000BaseLX
- high-speed Gigabit backbone

NB: GSM-FM/FS-2W also available for 8274

GSX-FM-4W

High-density Gigabit switch module for GRS

Application

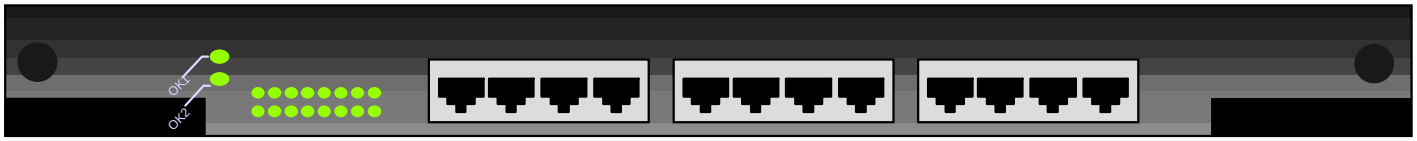


Features:

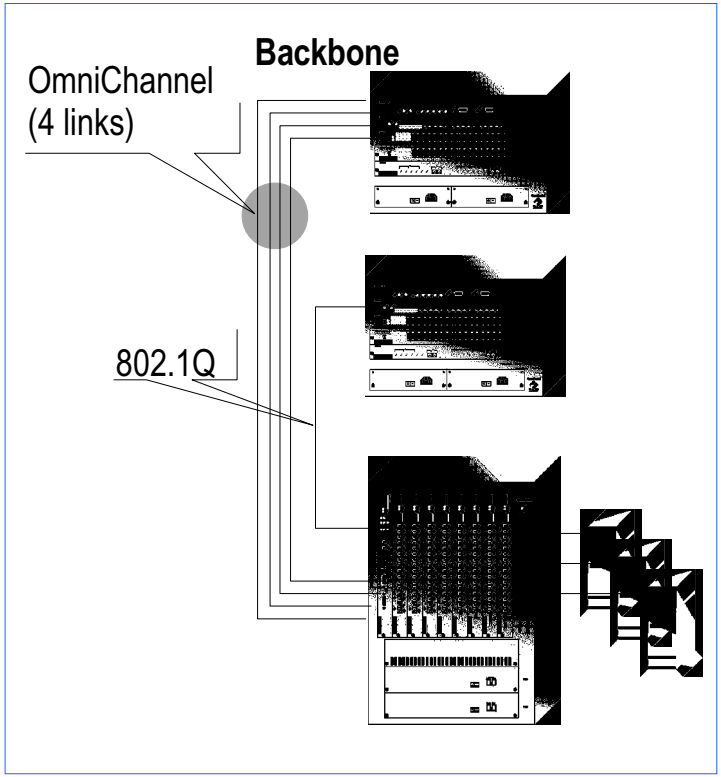
- high-density Gigabit switching - up to 32 ports
- multi-mode fiber
- backbone or server connections
- low cost - less than $2K per port

ESX-100C-12W

10/100 backbone switch module for GRS



Application

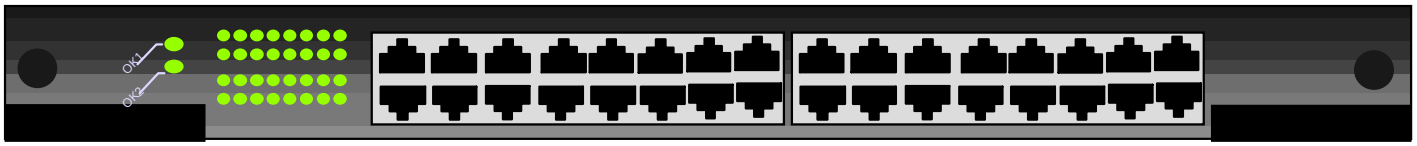


Features:

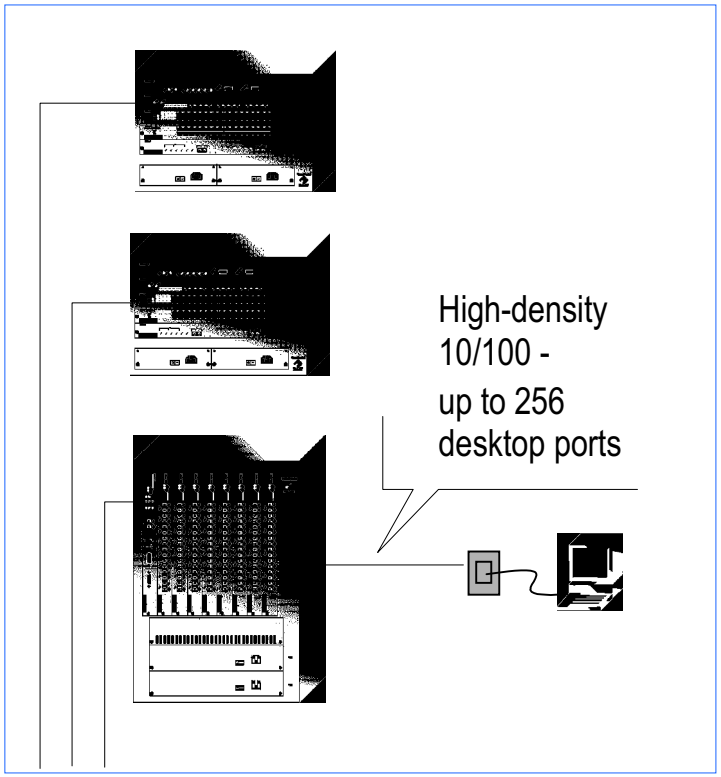
- auto sensing 10/100 switching
- high-speed GRS switch fabric
- powerful backbone features such as 802.1Q and RouteChannel
- high-speed server links

ESX-100C-32W

10/100 desktop switch module for GRS



Application

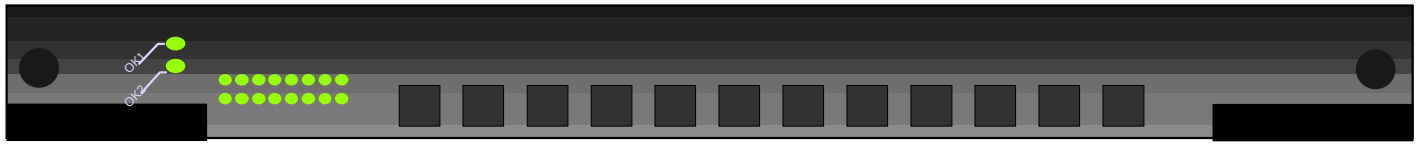


Features:

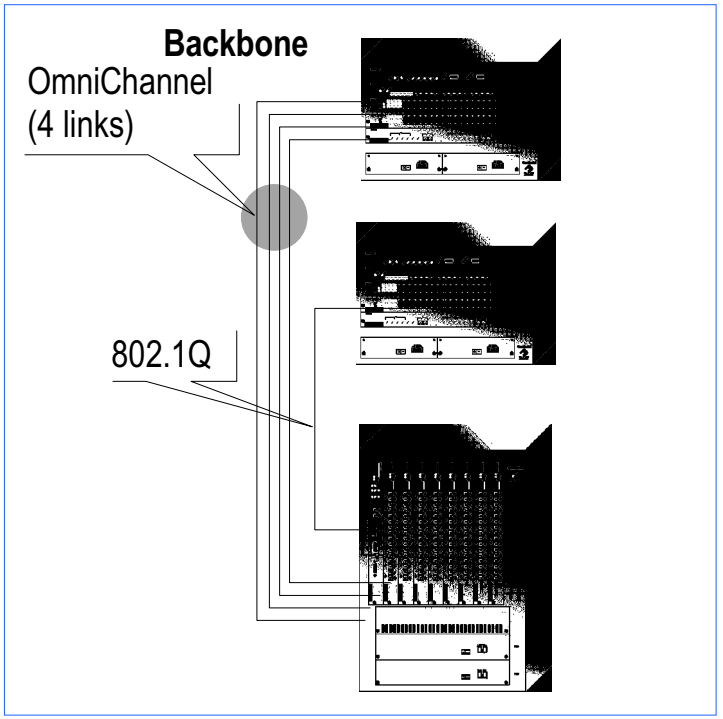
- auto sensing 10/100 switching
- high-density (up to 256 ports) Fast Ethernet desktop switching
- low cost - $230 / port

ESX-100FX-12W

100Base-FX backbone switch module for GRS



Application



Features:

- full duplex 100Base-FX switching
- small, compact MT-RJ fiber connector
- multi-mode and single mode option

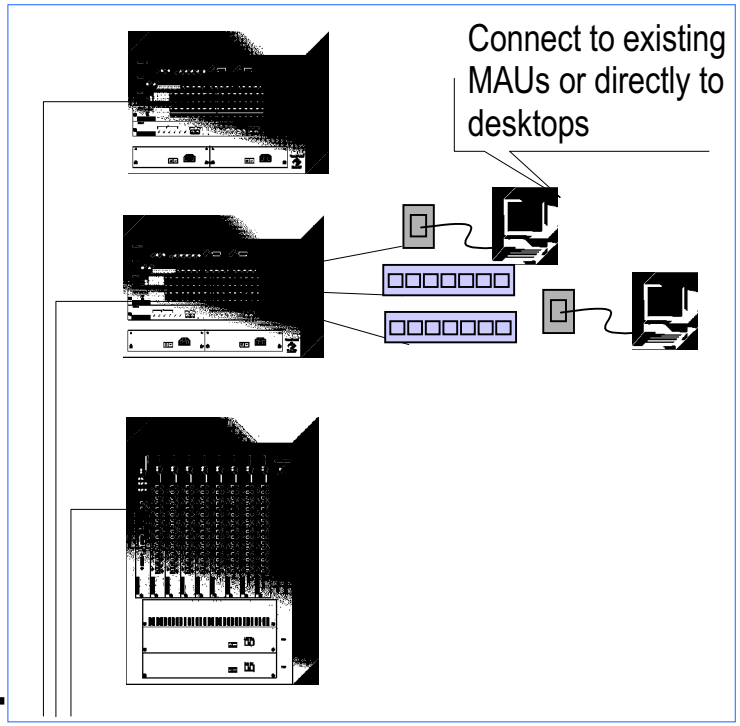
TSX-CD-16W

Token ring desktop or MAU switch module for GRS

Features:

- desktop or MAU connections
- micro-segmentation support for existing MAUs
- auto-sensing support for 4/16Mbps and half / full duplex operations

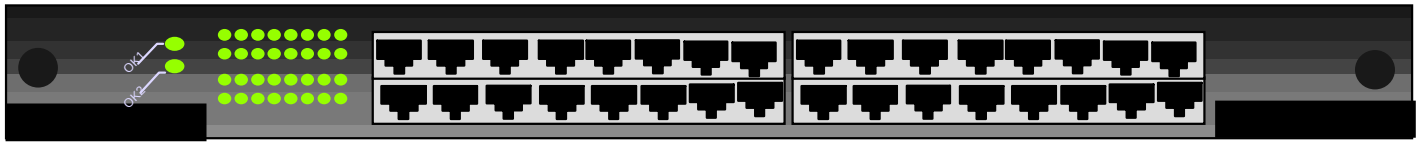
Application



NB: TSM-CD-16W also available for 8274

TSX-C-32W

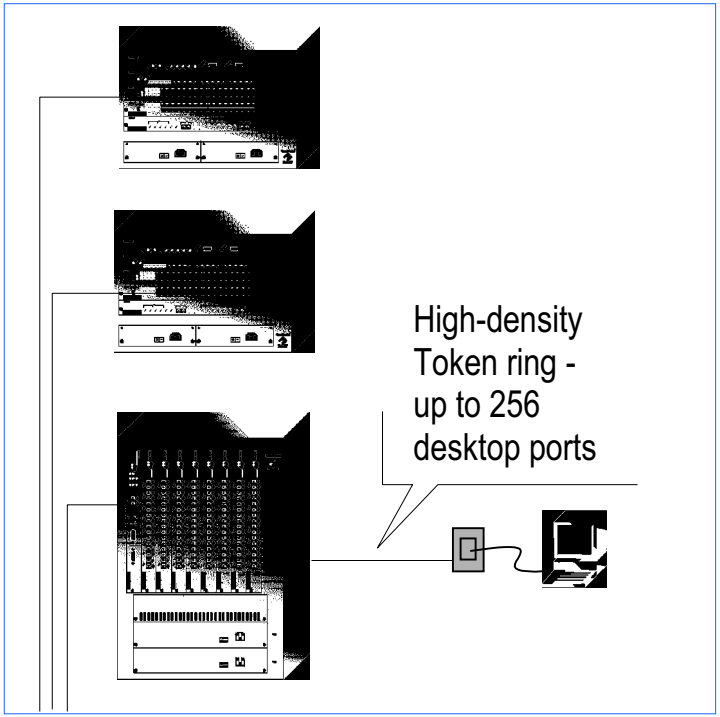
Token ring desktop switch module for GRS



Features:

- desktop connections
- high-density (up to 256 ports) token ring desktop switching
- low cost - $350 / port
- auto-sensing support for 4 / 16Mbps and half / full duplex operations

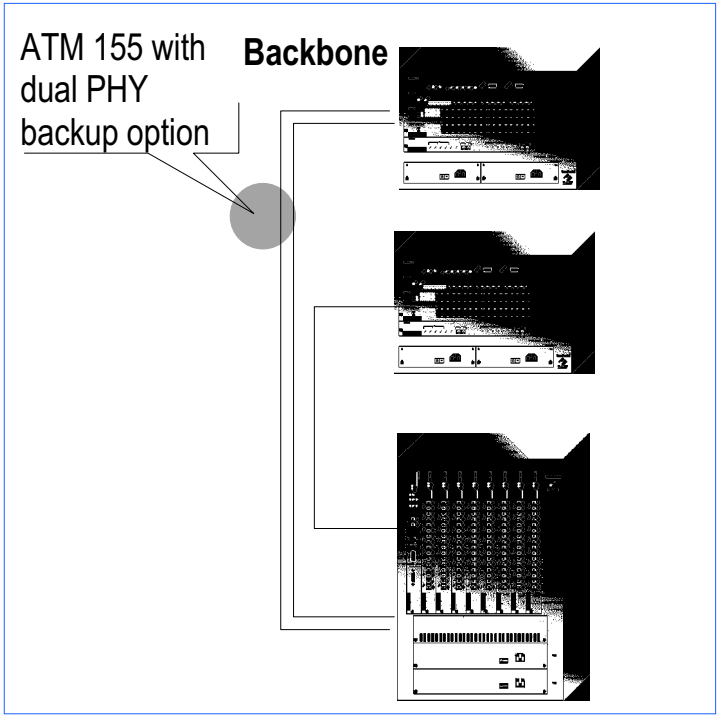
Application



ASX-155FM-1W-4C

ATM 155 Uplink 1-port

Application



Features:

- multi-mode fiber
- provides high-speed uplink connectivity for GRS to 155Mbps ATM backbones

Additional GRS product family

Modules for possible release over the next 3-6 months:

- 2-port ATM dual PHI 622
- 2-port ATM dual PHI 155
- 8/16-port 10BaseFL
- 5-slot chassis

GRS rollout plan

8274-GRS Product Launch and 8274/8277 rel. 3.4

- New GRS chassis and modules
- New modules for existing 8274
- Microcode for both 8274/8277 and GRS

Announcement:

- January 26, 1999

General Availability

- April 23, 1999

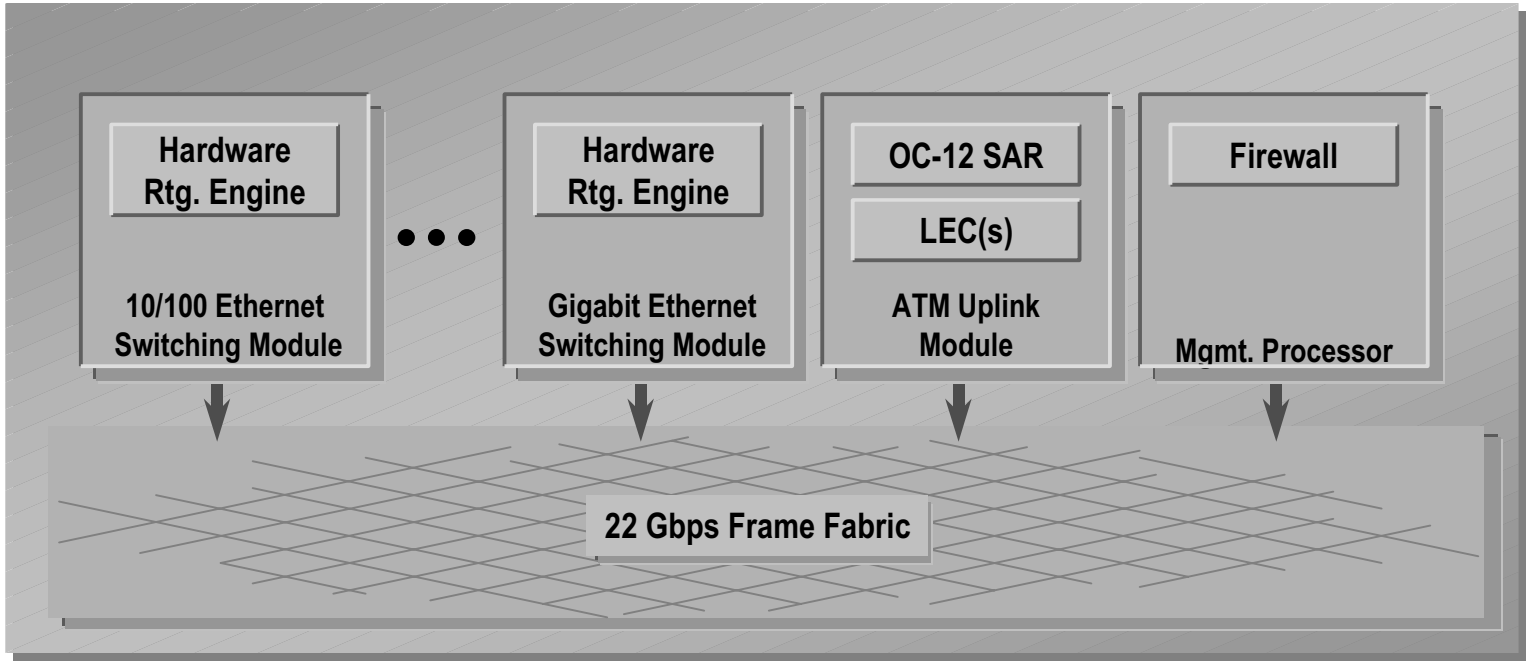
GRS architecture

GRS system capacity

- ✓ switching capacity 22Gbps

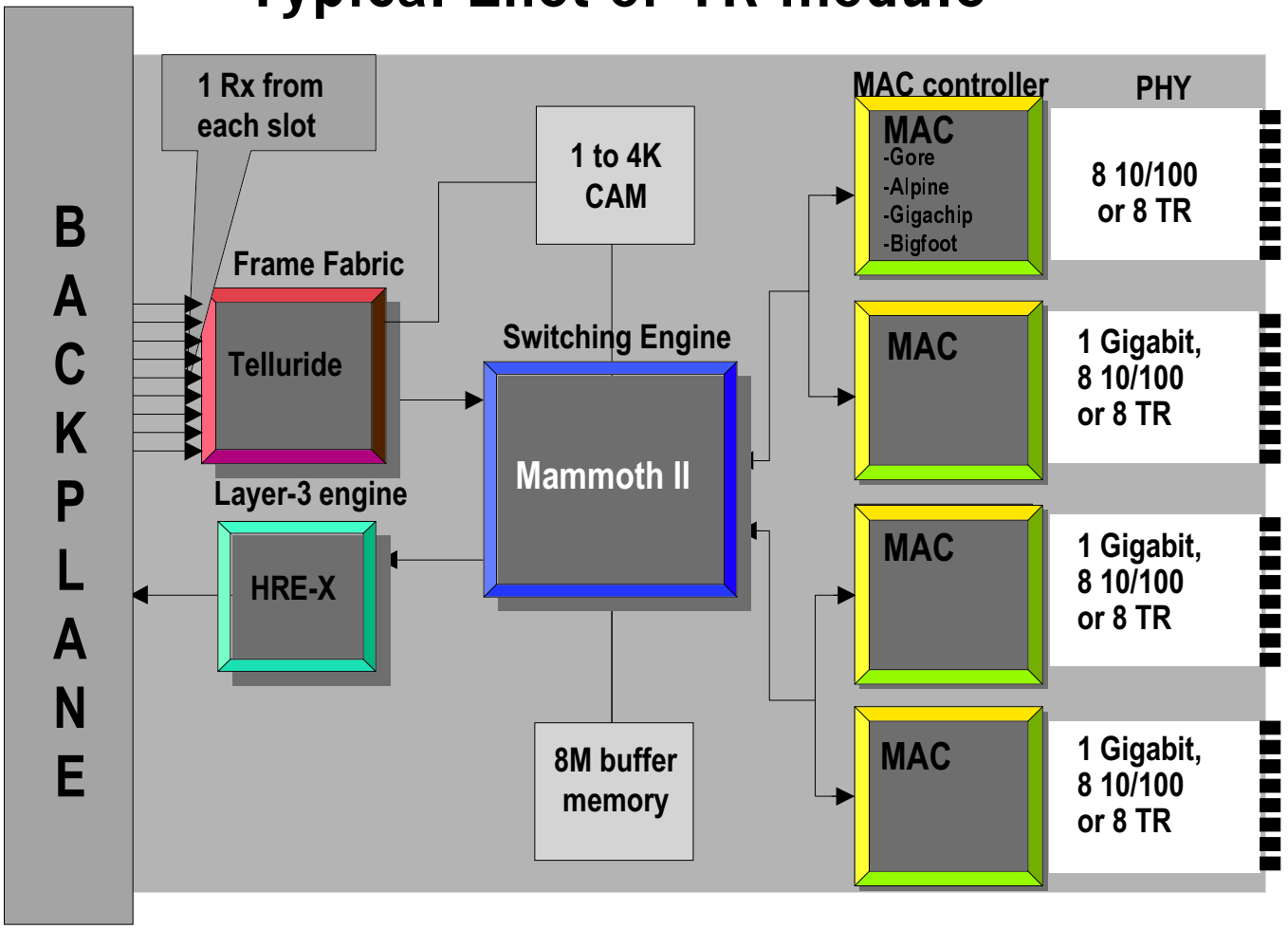
GRS distributed L3 switching

- ✓ 1.5M to 12 Million Packets Per Second

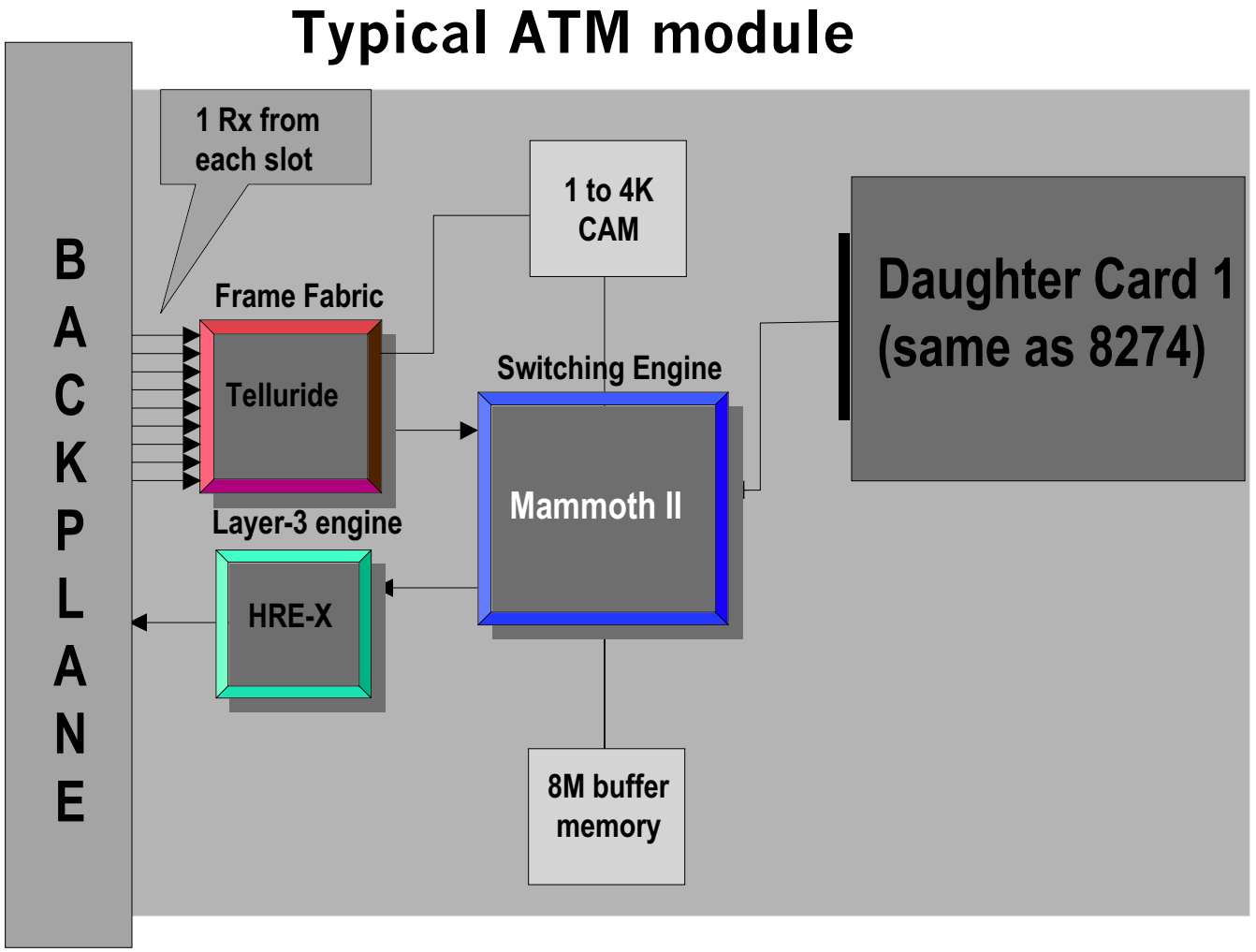


GRS architecture

Typical Enet or TR module



GRS architecture



So, in summary…

8274 GRS from IBM

Gigabit L2/L3 Switching

It's coming, Go sell!