LAN Applications and Magellan Solutions

Robert Tomkins

Passport InterLAN Switching Product Manager
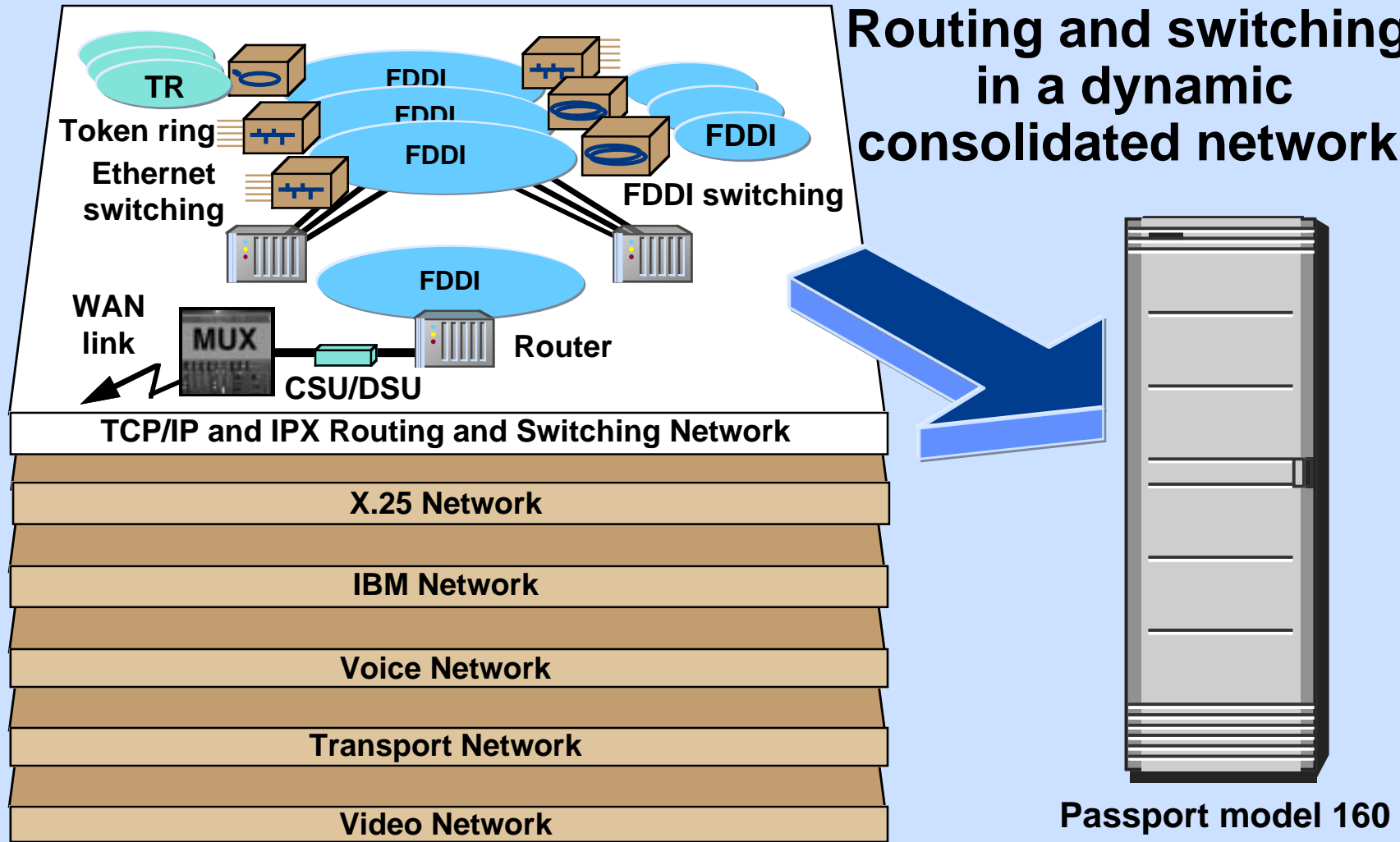
robert_tomkins@nt.com

NORTEL
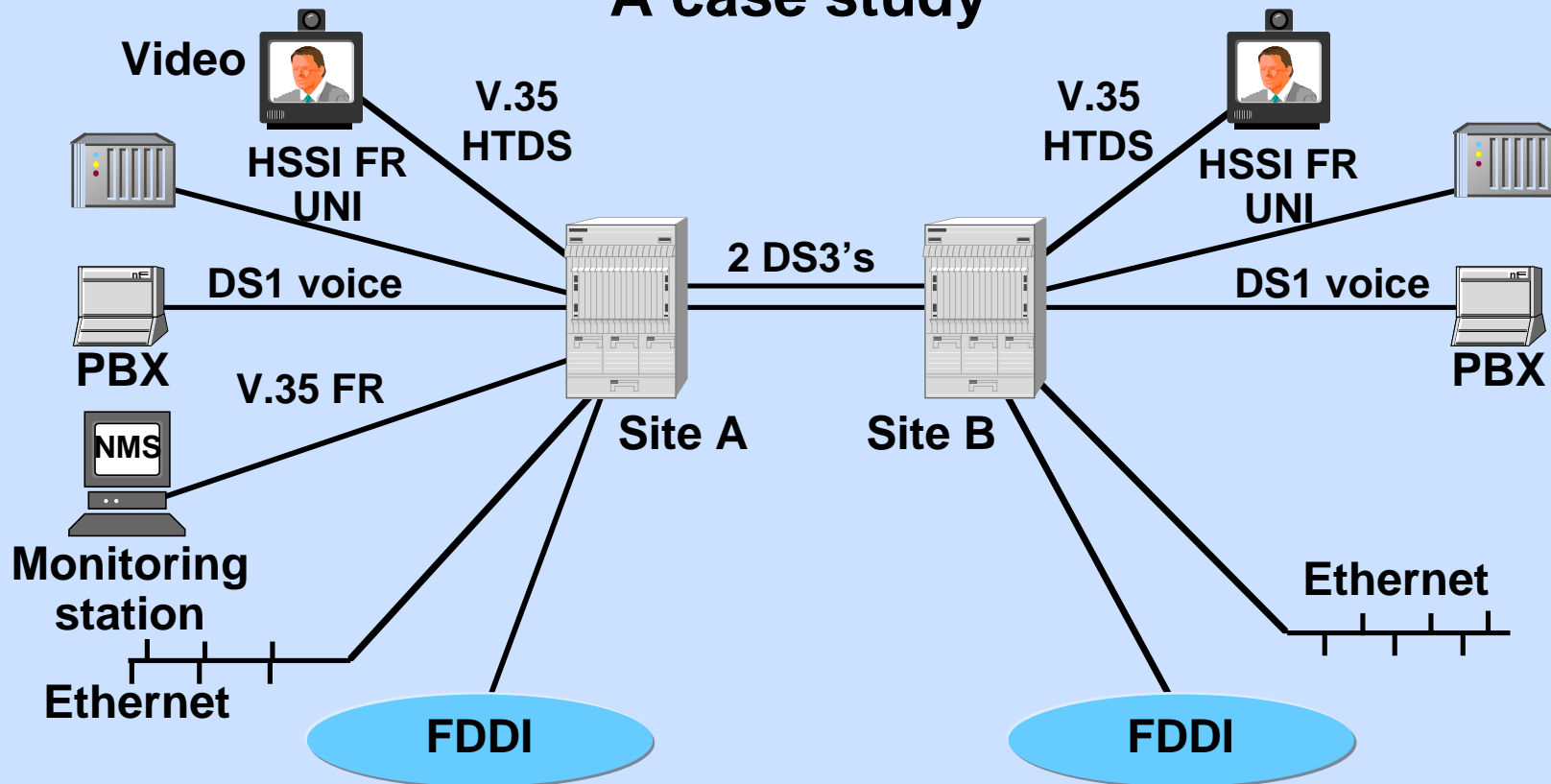NORTHERN TELECOM

INFORM '96

Agenda

- **InterLAN applications**
  - network consolidation
  - collapsed backbones
  - routing
  - switching
  - security
  - redundancy
  - edge routing and backbone switching
  - ATM migration

- **Passport improves networks**
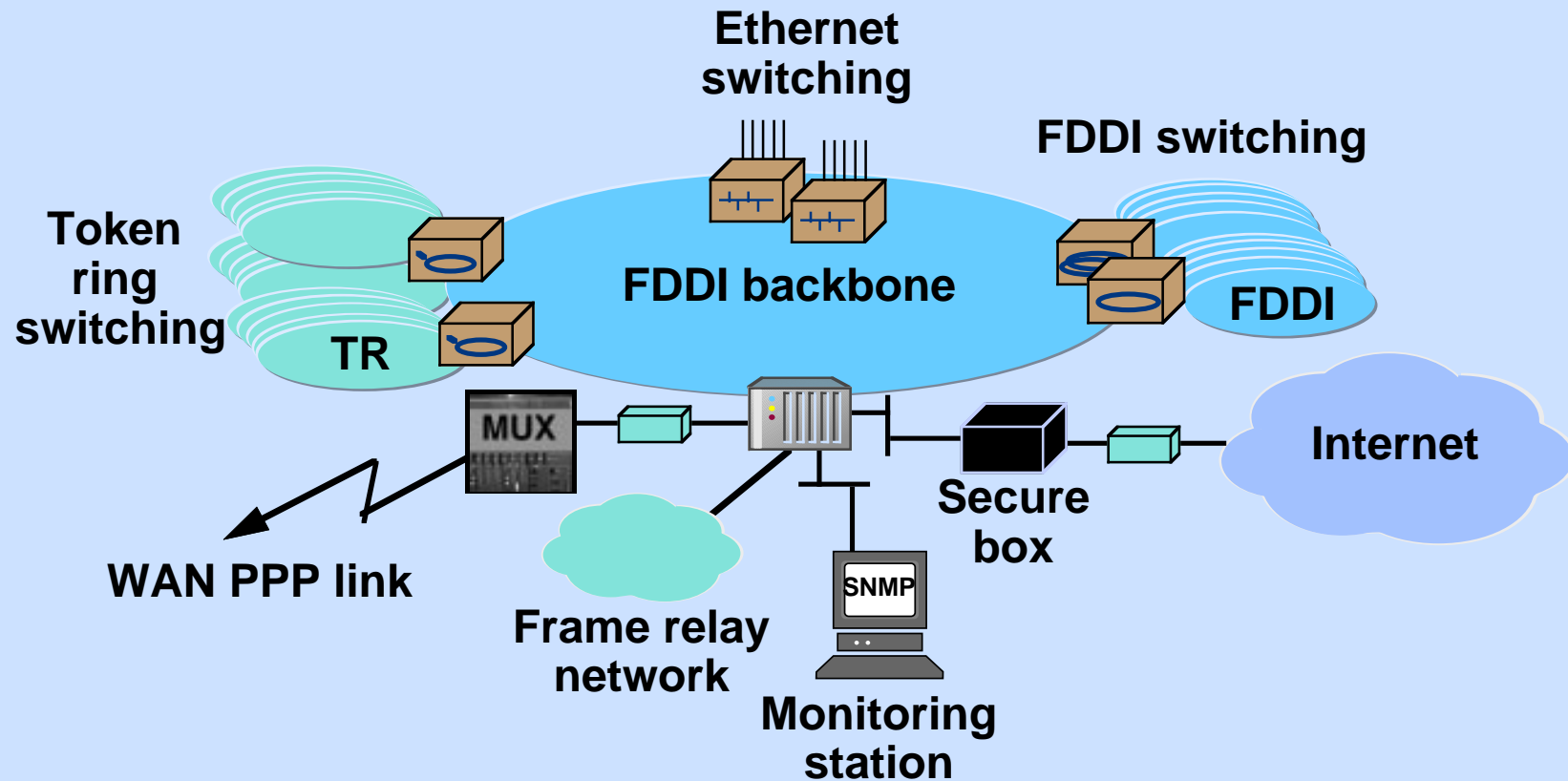
Network Consolidation

Routing and switching in a dynamic consolidated network

TR
Token ring
Ethernet switching
FDDI
FDDI
FDDI
FDDI
FDDI switching
FDDI
WAN link
MUX
CSU/DSU
Router

TCP/IP and IPX Routing and Switching Network

X.25 Network

IBM Network

Voice Network

Transport Network

Video Network

Passport model 160

Applied Network Consolidation

A case study

Simplify and save

Complex Backbones

Ethernet switching

FDDI switching

Token ring switching

FDDI backbone

TR

FDDI

MUX

Internet

WAN PPP link

Secure box

Frame relay network

SNMP
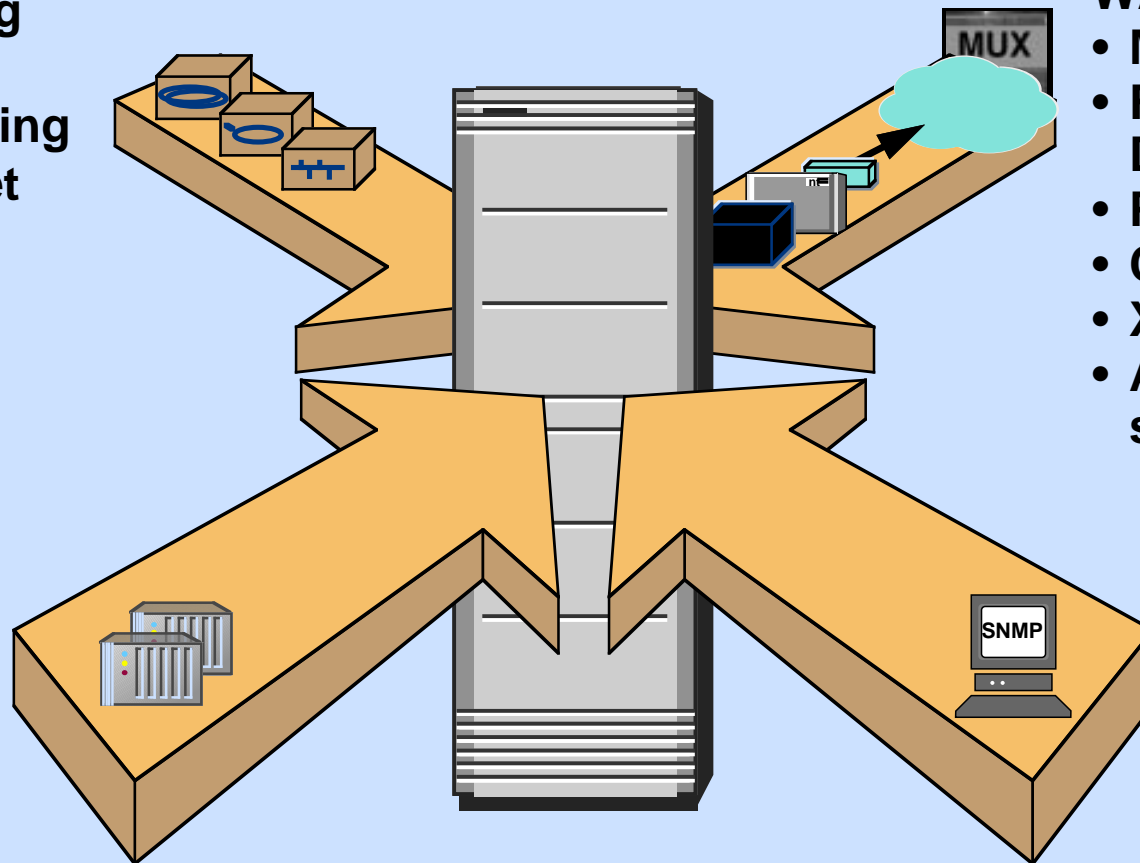
Monitoring station

Multiprotocol, many device entities

5

Collapsed Backbones

Switching
- FDDI
- Token ring
- Ethernet

WAN
- MUX
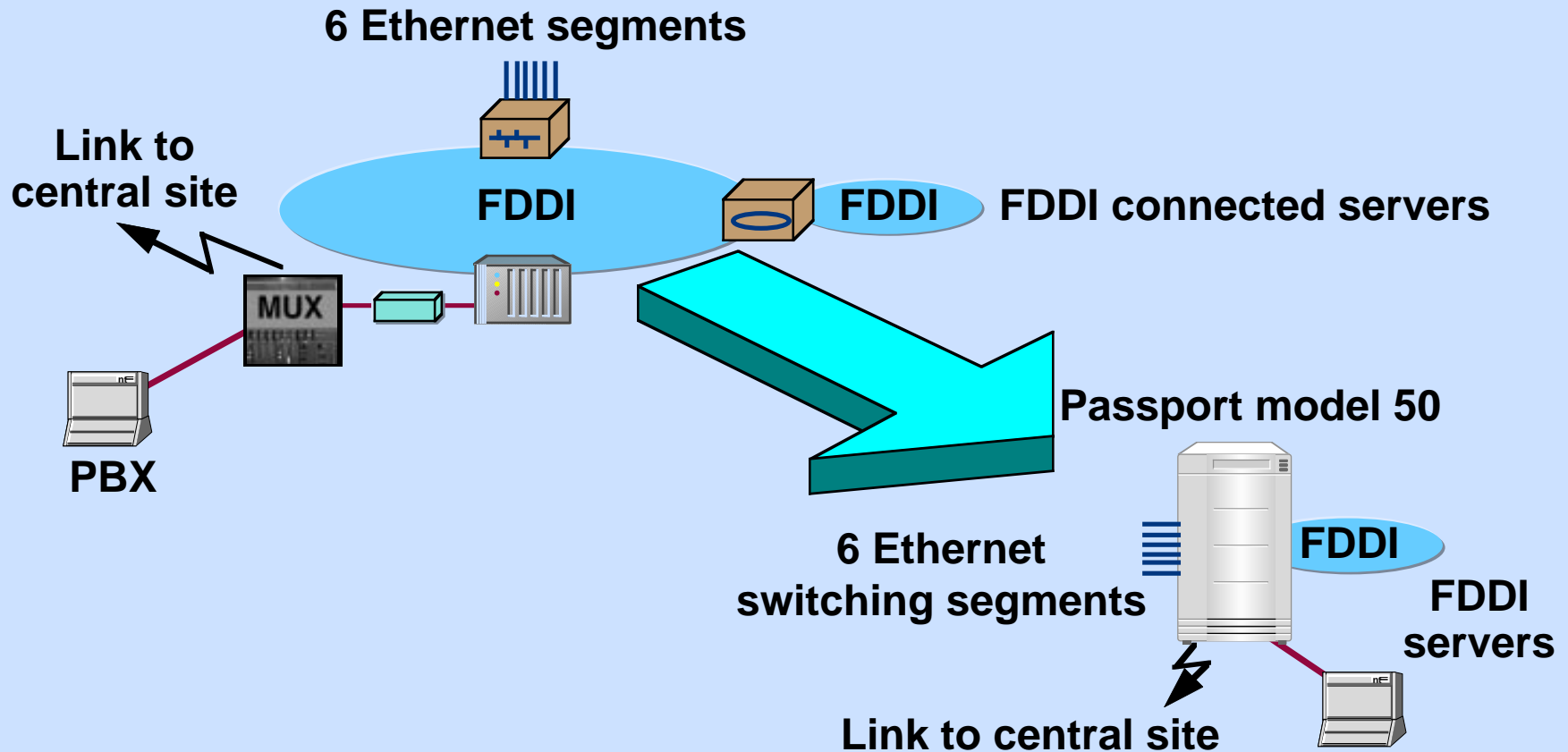- Frame relay DTE
- PPP
- CSU/DSU
- X.25 DTE
- Advanced security

MUX

Routing
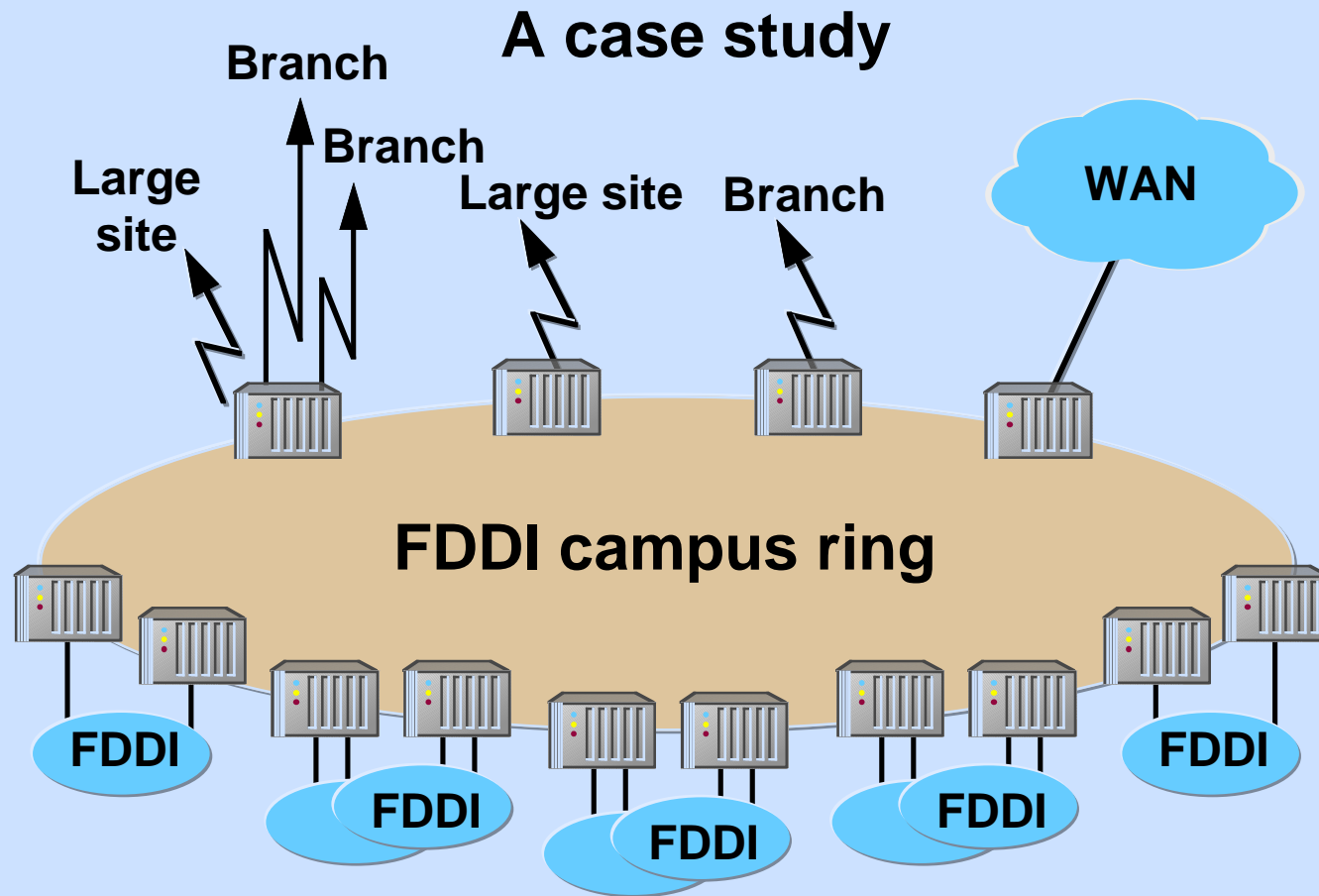- IP
- IPX

SNMP

Network Management
- SNMP

High-performance, cost-effective, and simple

Branch Collapsed Backbone

6 Ethernet segments

Link to central site

FDDI

FDDI **FDDI connected servers**

MUX

PBX

Passport model 50

6 Ethernet switching segments

FDDI

FDDI servers

Link to central site

Simple, cost-effective, and easy to manage

Aged, Low Density Routers

A case study

Branch

Branch

Large site

Large site

Branch

WAN

FDDI campus ring

FDDI

FDDI

FDDI

FDDI

FDDI

Legacy routers require frequent maintenance

High Density, Modern Routing

Branch

FDDI

WAN

Branch

FDDI

Large
site

FDDI campus ring

Large
site

FDDI

Large
site

FDDI
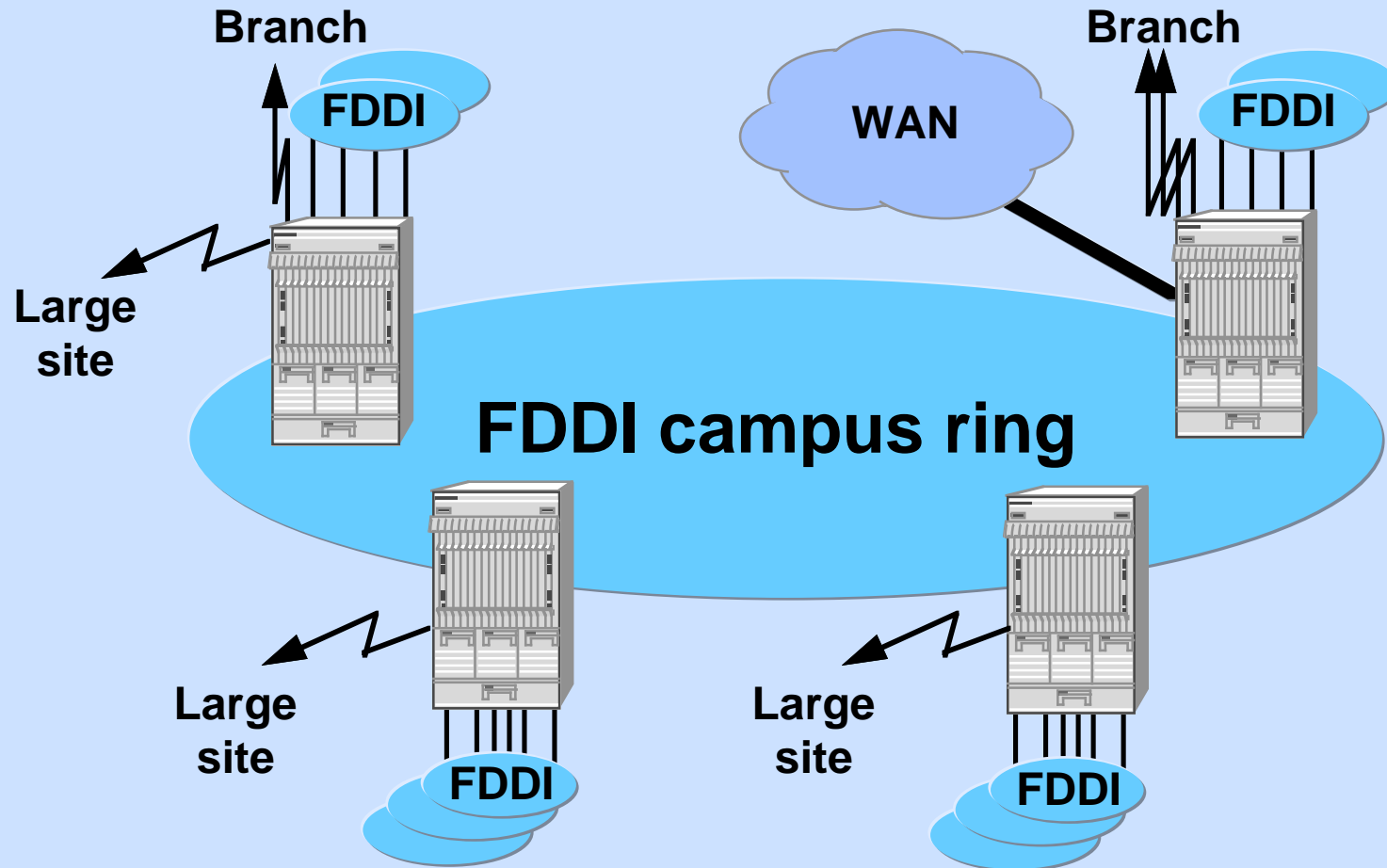
Consolidated, low maintenance routing

Bridges and Concentrators

Blocking

Bus

Approx. bus speeds:
200 Mbit/s - FDDI
20 Mbit/s - Ethernet
30 Mbit/s - Token Ring

Input ports

Processor card

Output ports

Packet forwarding is performed on a special card

Frames cross the bus twice

Software-based forwarding
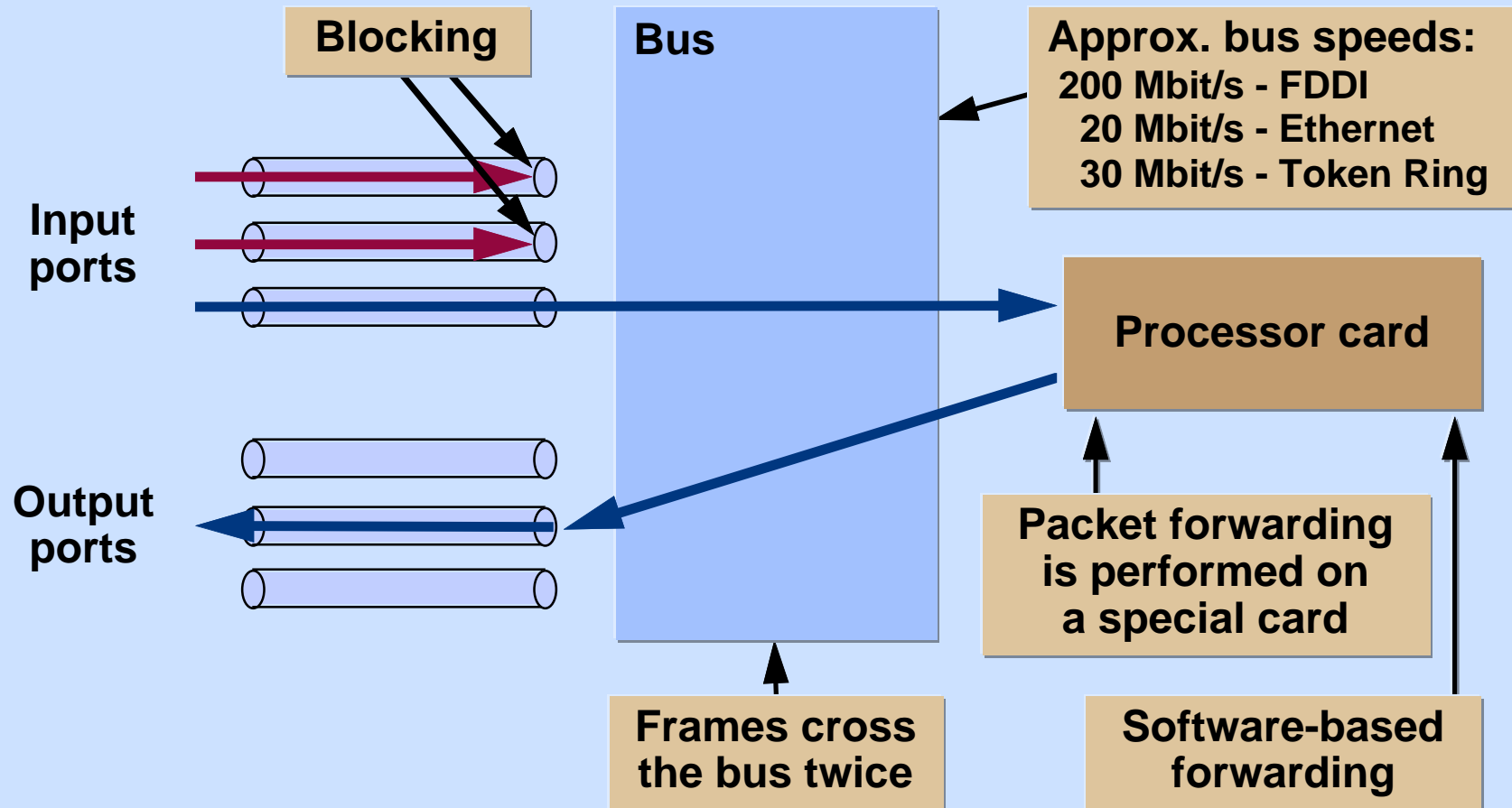
Bandwidth bottlenecks

Passport Switching

Packet forwarding is performed on the input FP

1.6 Gbit/s backplane (dual 800 Mbit/s buses)

Hardware-based for low latency

Input ports

Output ports

Non-blocking

Frames cross the bus once only

Improved port density
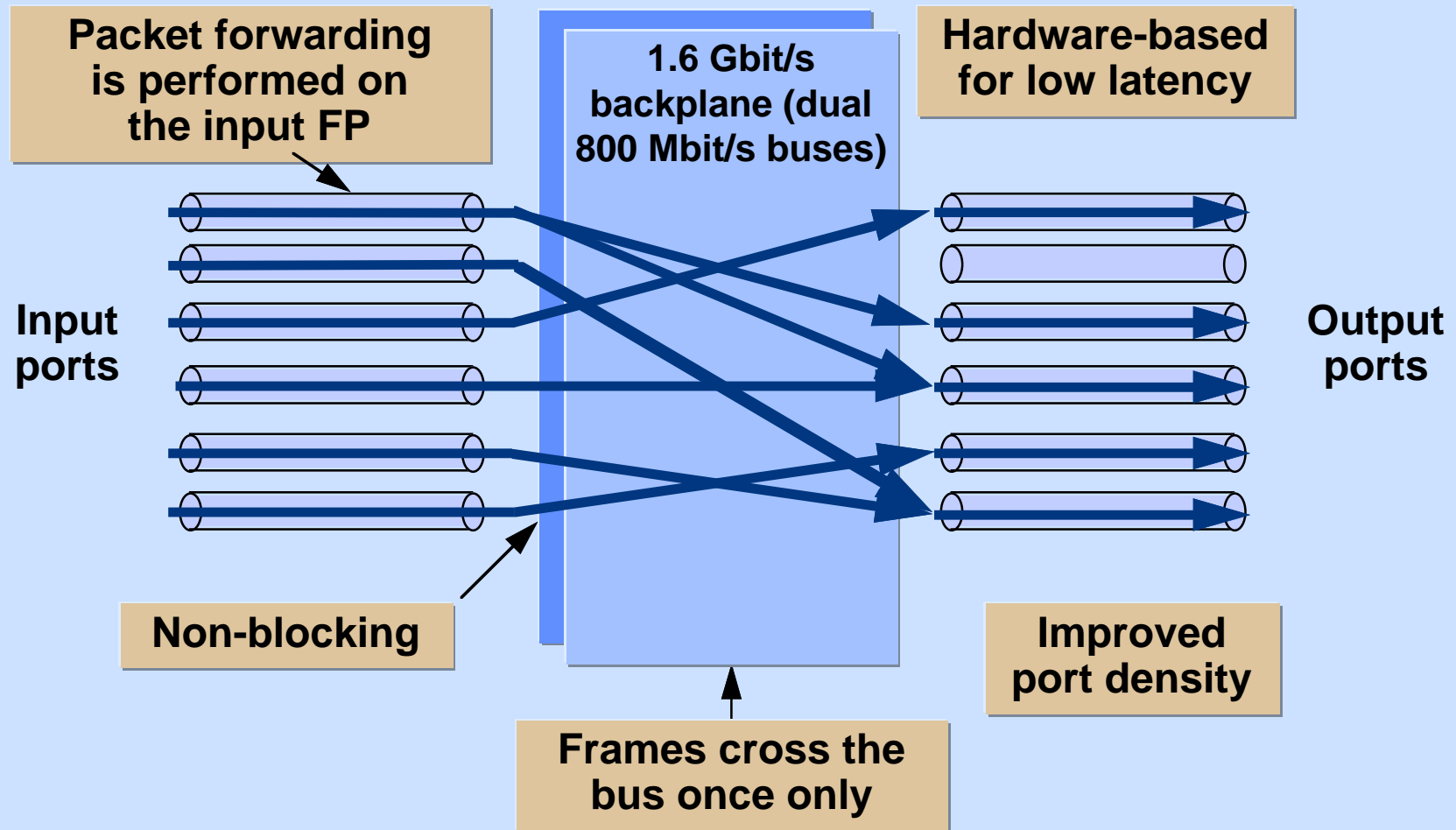
High throughput, efficient switching

Router Security

Corporate network — **Internet** — **Corp. Info** / **Intruder**
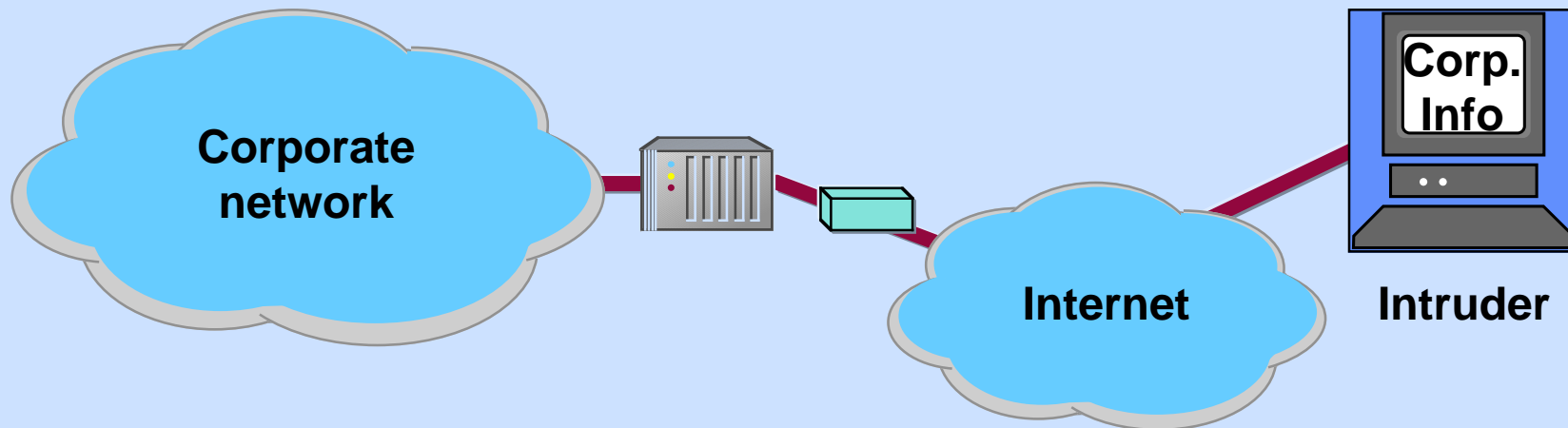
Simple filters don't make a network secure

Network Security

Corporate network

Intruder

Internet

Intruder Alert!

Corporate security

Intruder's packet redirected to corporate security for inspection
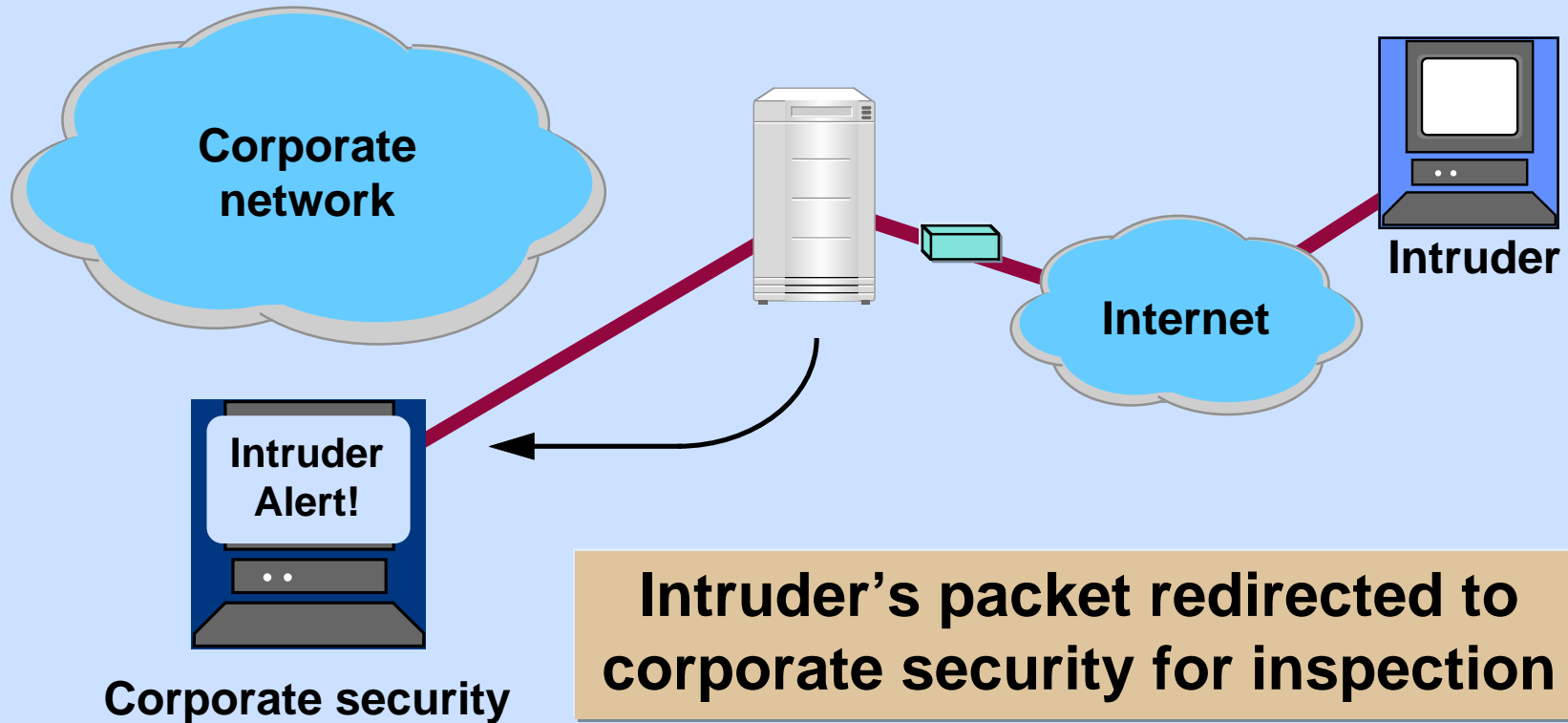
Advanced packet filtering and security
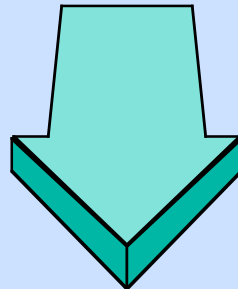
Redundancy

Router failure!

Corporate network

Token ring

Most routers have no redundancy...

Passport is fully redundant

Standby functional processors

Dual load-shared buses

Backup power supply

Redundant fans

Passport model 50

Passport model 160
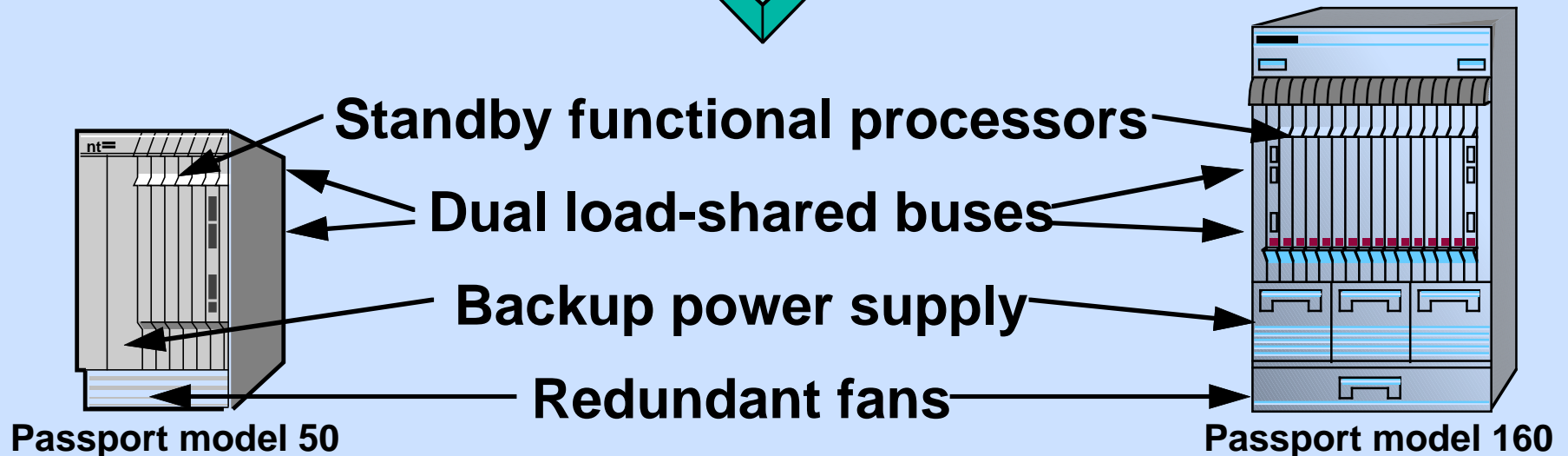
Port Redundancy

A case study

FDDI campus ring

Redundant pair of routers

FDDI

FDDI

FDDI

FDDI

FDDI

FDDI campus ring

Improves reliability and reduces cost

FDDI

FDDI

FDDI

FDDI
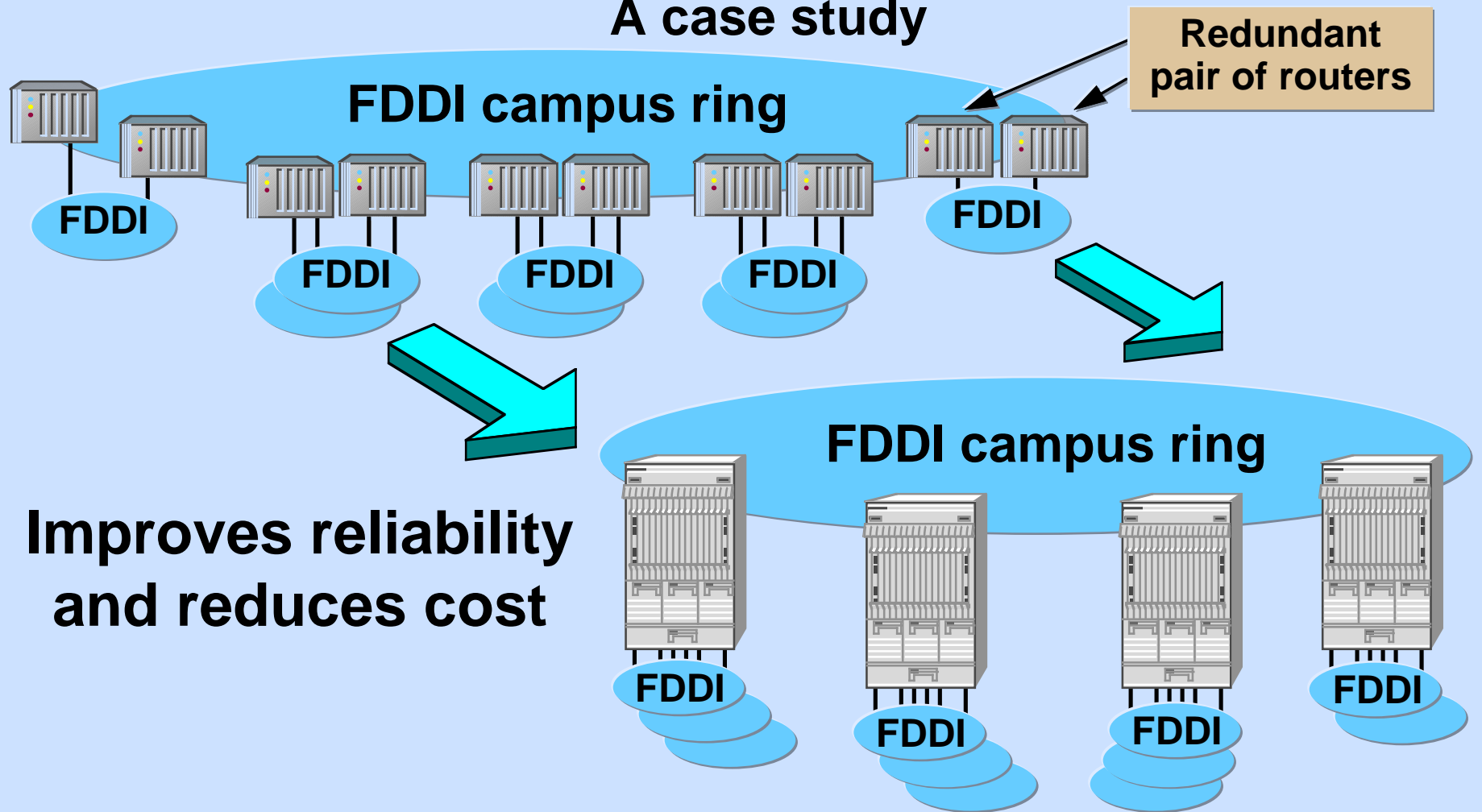
Edge Routing/Backbone Switching

Router backbone

1st hop

. . .

16th hop

Passport 1

Passport backbone

Passport 17

Logical LAN

1st hop

2nd hop
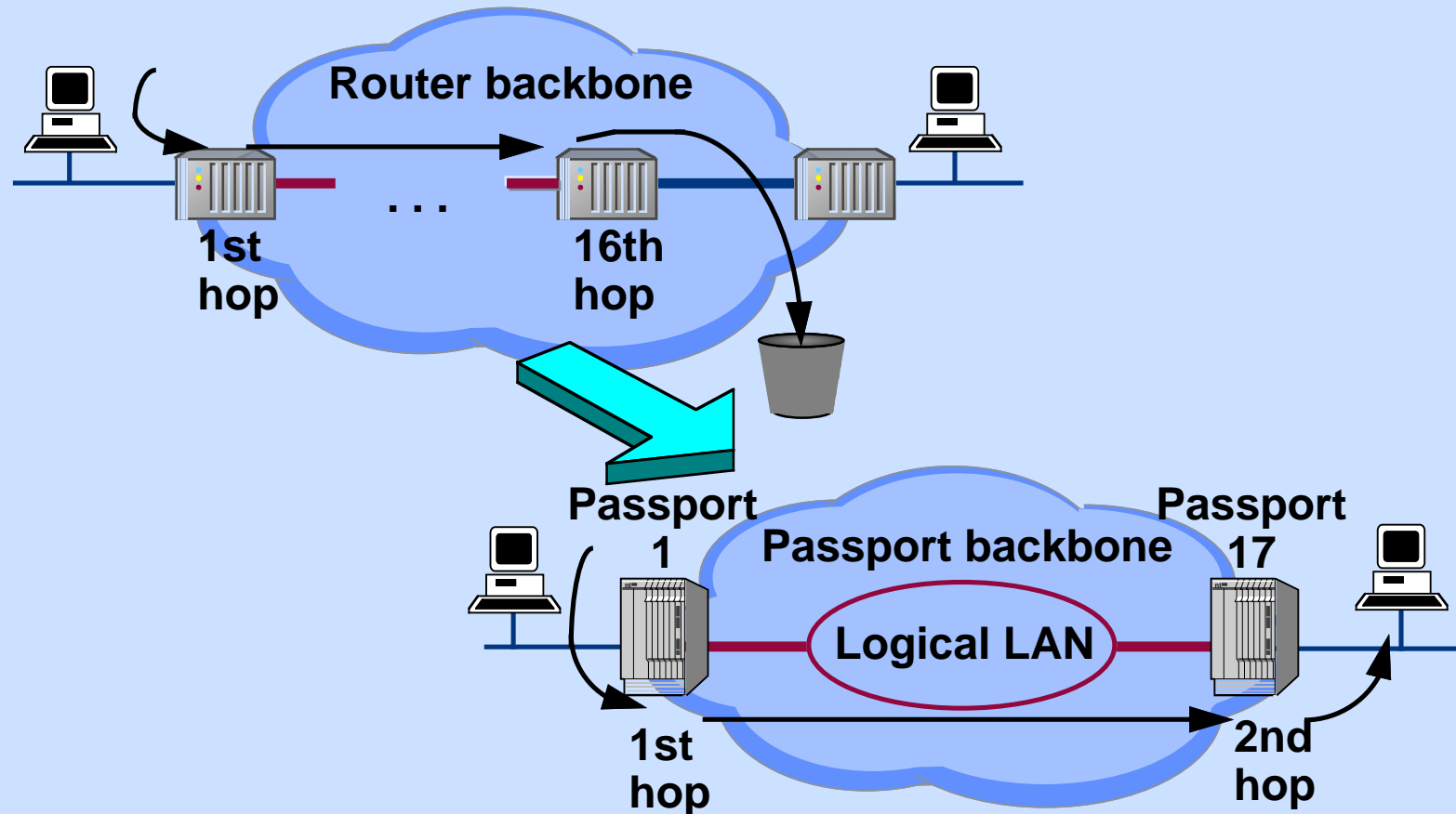
**Simplifies the logical topology
and reduces routing protocol hops**

LAN ATM Evolution

RFC 1483

Ethernet LANs

Shaping

ATM UNI

Priorities

LAN Emulation

Congestion controls

Re-assembly storage

LANs

ATM switch

Emulated LANs
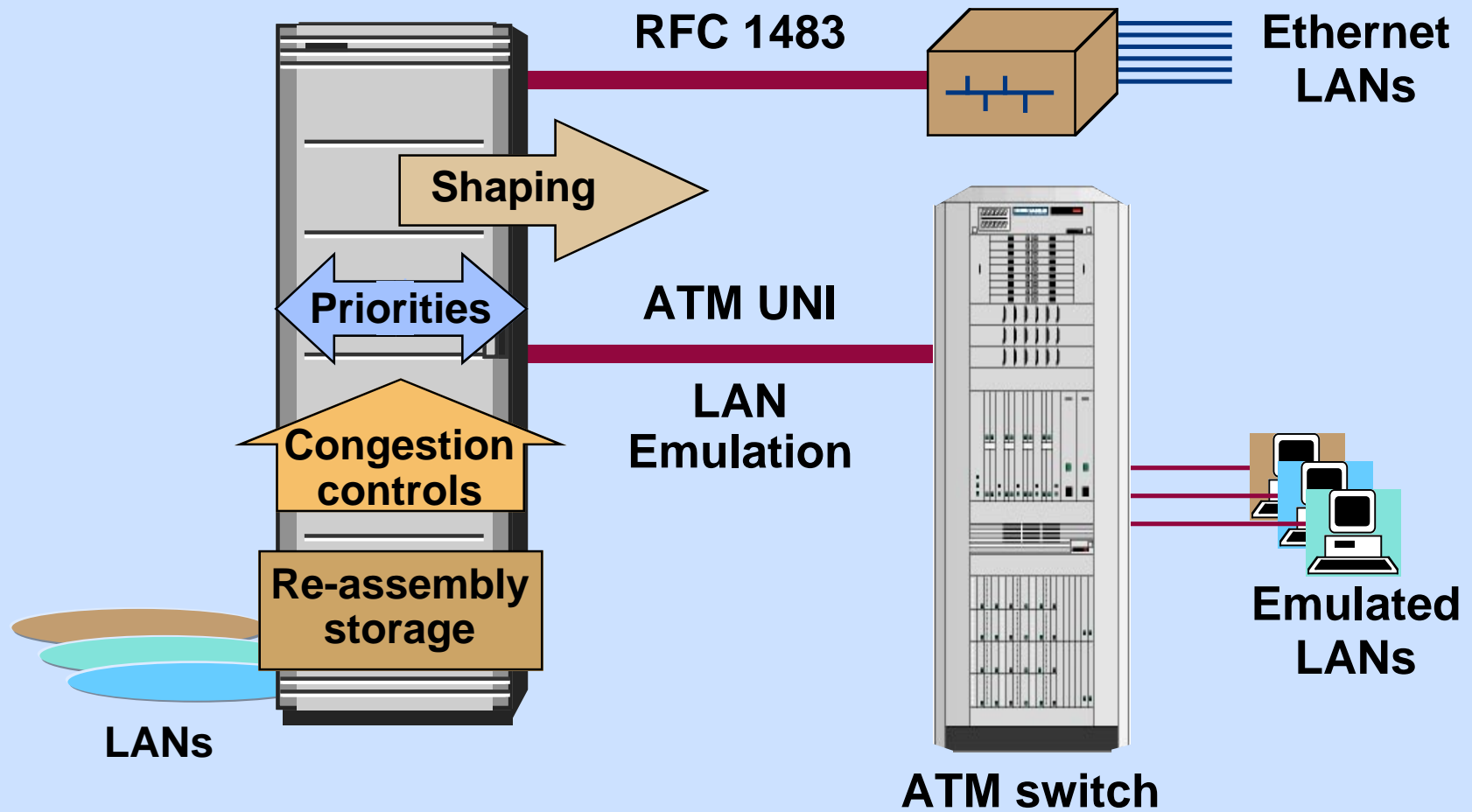
Standards-based ATM migration

WAN ATM Evolution

Passport frame/cell trunking

Frame relay

ATM UNI 3.1

Passport ATM trunking
- **Encapsulates RFC 1483, voice, video, etc.**

ATM UNI 3.1

ATM encapsulation via RFC 1483
- **For Passport to router connections**
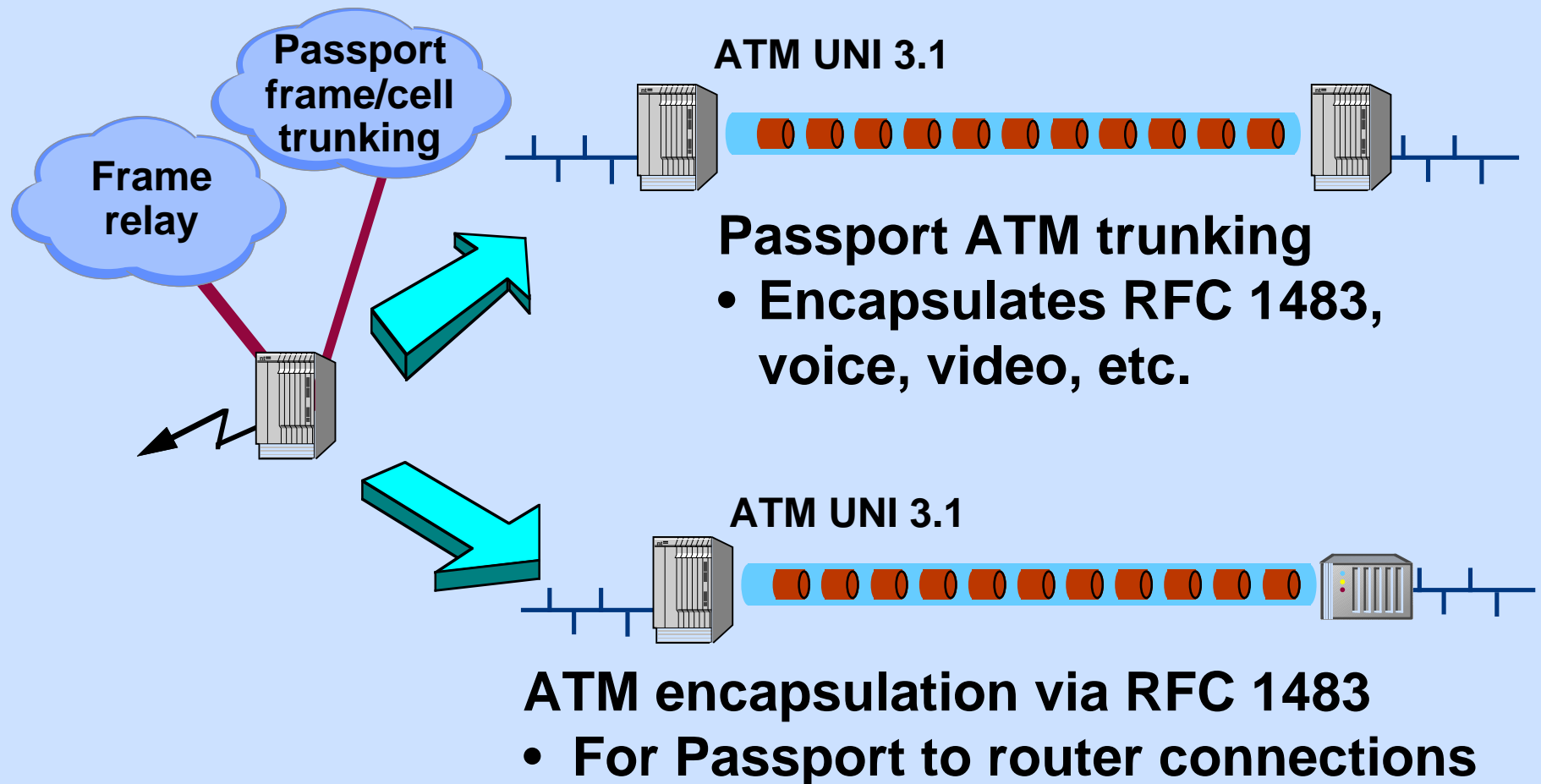
Smooth migration to WAN ATM

Full Magellan ATM Interoperability

Legacy LANs

FDDI

TR

ATM

ATM

Passport

Vector

Concorde
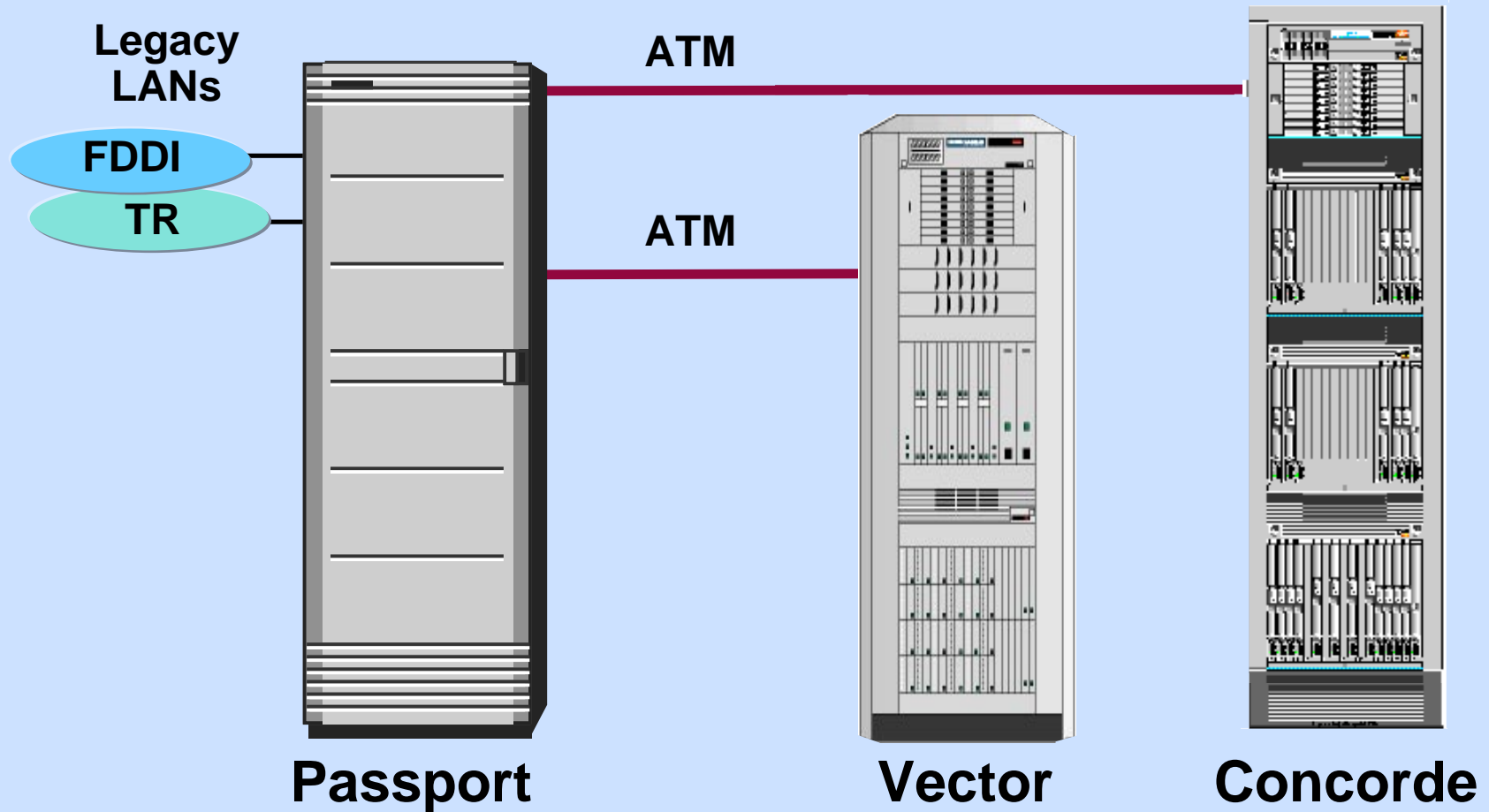
Passport Improves Networks

- Dynamic bandwidth consolidation
- Simplifying the network topology
- Reducing the number of network devices
- Increasing the network throughput performance
- Increase network reliability
- Advanced filtering and security
- Simplifying network management
- Easy, standards-based ATM migration

Passport interLAN switching can be used to improve a wide variety of enterprise networks through fully-featured LAN internetworking