NHD Strategy Overview

Rob Zimmer

Director, Strategy

Networking Hardware Division

IBM Corporation

Gartner Group:

What's *HOT* in the Enteprise

Layer 3 Switching

Virtual Private Networks (VPNs)

Voice/Data Integration

Policy Management

IBM

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IBM

Layer 3 Switching

Cisco 7x00
Router

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"In local area networks, 70% of the Cisco 7x00 series routers will be forklifted over the next three years."

IBM

Layer 3 Switching

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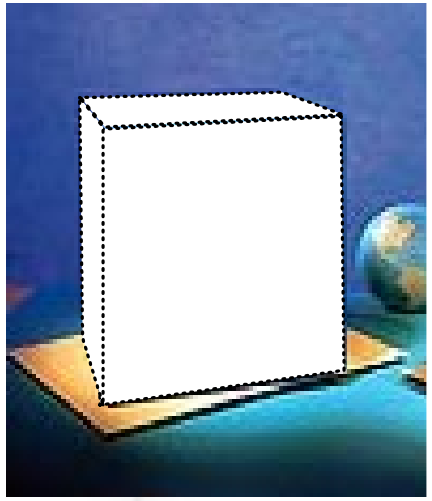
Cisco 7x00 Router

IBM

Layer 3 Switching



Cisco 7x00
Router

"In local area networks, 70% of the Cisco 7x00 series routers will be forklifted over the next three years."

IBM

"Let's Make a Deal"

Behind Door No. 1

Cisco 8510
Router
$42,000

Behind Door No. 2

Cisco 8510
Router
$42,000

IBM 8371 Multilayer
Ethernet Switch
$15,000

Functionally equal, significant cost difference!

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Router
$42,000

IBM 8371 Multilayer
Ethernet Switch
$15,000

Which Layer 3 Switch would you select?

Gartner Group:

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Layer 3 Switching

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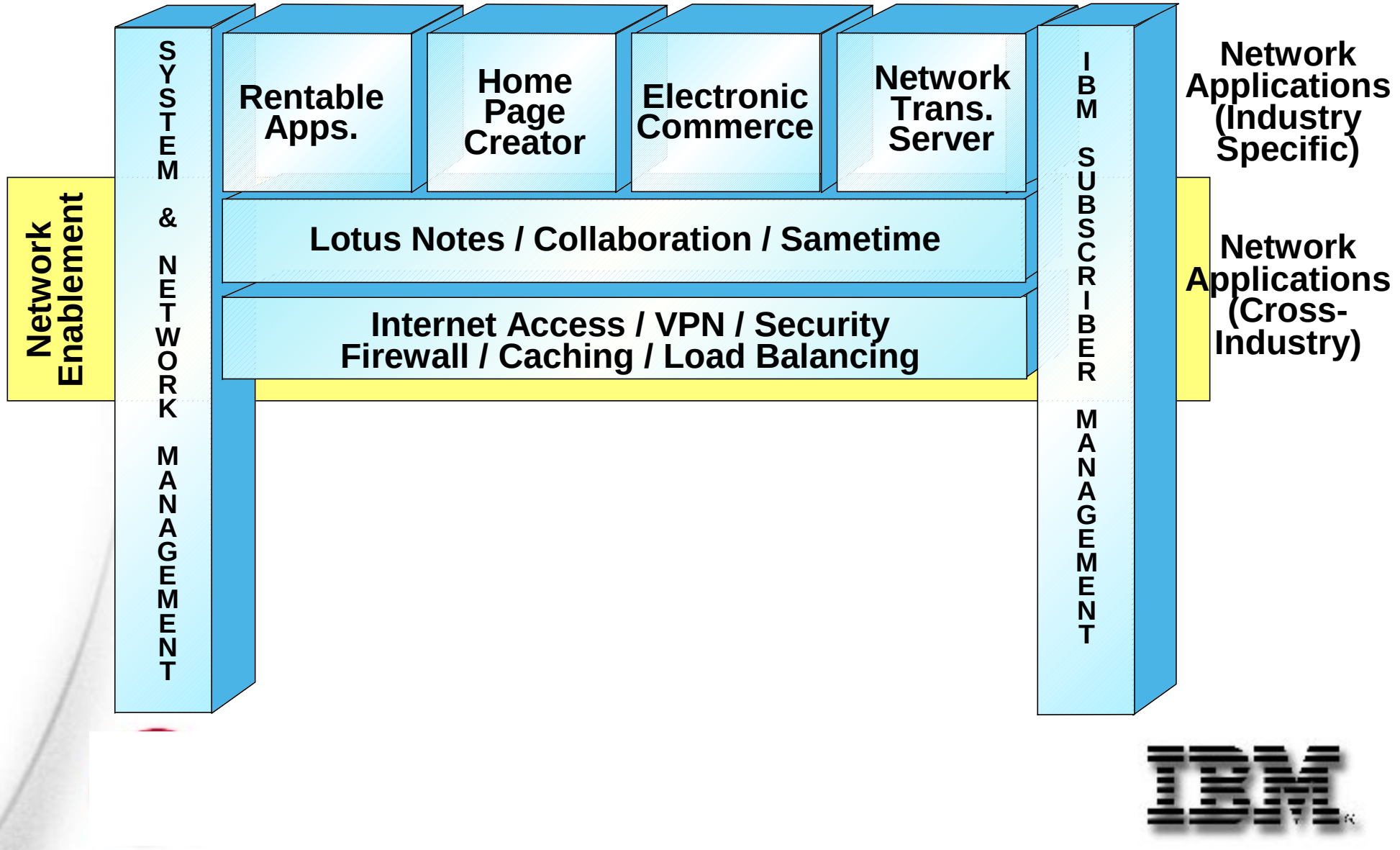
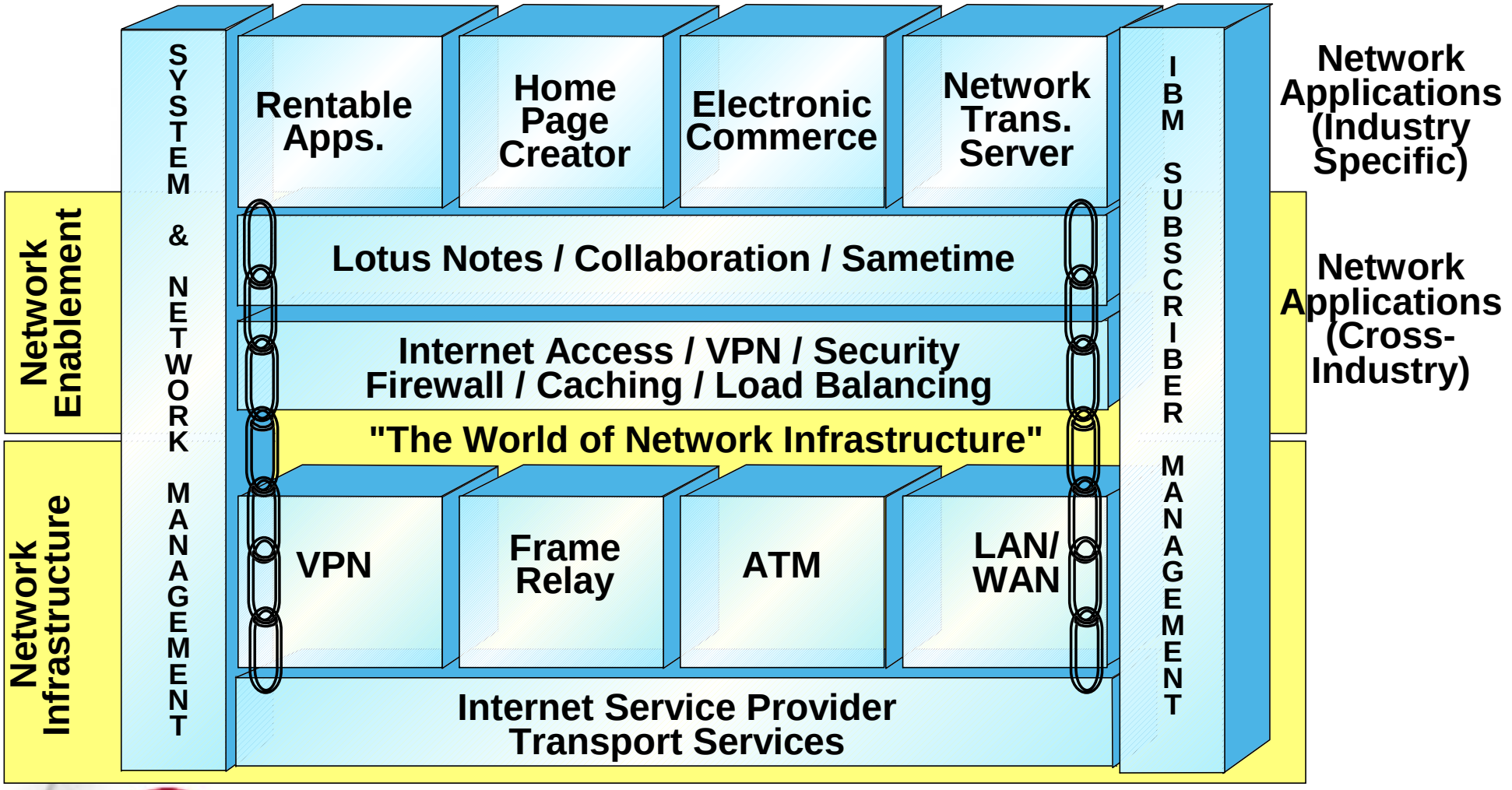
IBM

e-business Product Framework



e-business Product Framework



Emerging Industry Standards
(i.e. Policy Management)

Creating an IP Service Level Agreement

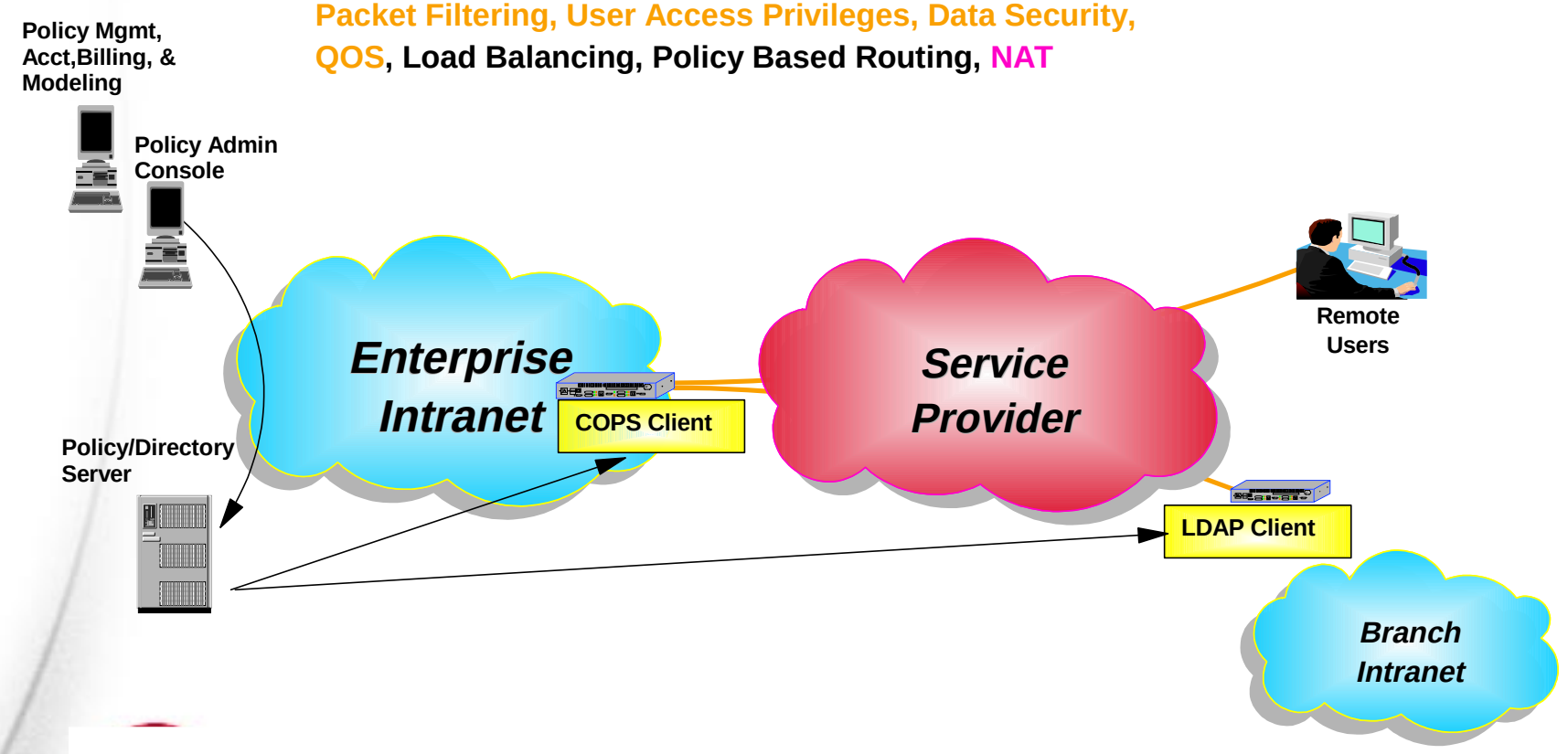
- CC5 (6/99)
- 9-12/99
- 3-11/00

NWays Management
- Policy Administration Console (PAC)
- Network Monitoring, Accounting, Billing, & Modeling

Network Devices
- LDAP, COPS clients
- Common Policy Engine
- Directory, Policy Server
- Policy Enforcement

  Packet Filtering, User Access Privileges, Data Security, QOS, Load Balancing, Policy Based Routing, NAT

Customer value propositions:
1. Security/QOS Policy Enforcement
2. Centralized Policy Management
3. Scalable Policy Management



Policy Management links the server access with the VPN/Branch solutions

Functions and Work Items

Policy Definition Tool (DEFN)

- What: Interpret SLA and populate policy repository
- Who: Systems/Network Management Development

Specific Schema Definition (SCH)

- What: Standards-based definitions for security, QoS, box configuration
- Who: Research and standards

Lightweight Directory Access Protocol (LDAP)

- What: Standards-based client/server protocol interface to repository
- Who: Network Management, Network Device Development

Policy Decision Point (PDP)

- What: Interpret schema for specific networks and devices
- Who: Network Device Development

Common Open Policy Server (COPS)

- What: Standards-based protocol interface between a PDP and a PEP
- Who: Network Device Development

Policy Enforcement Point (PEP)

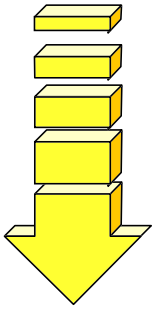
- What: Software and Hardware packet classifiers, packet markers, policers, shapers
- Who: Network Device Development

Service Level Monitoring and Management

- What: Collection, Analysis & Management of PDP & PEP data
- Who: Network Management, Network Device Development

Policy-based Management Work

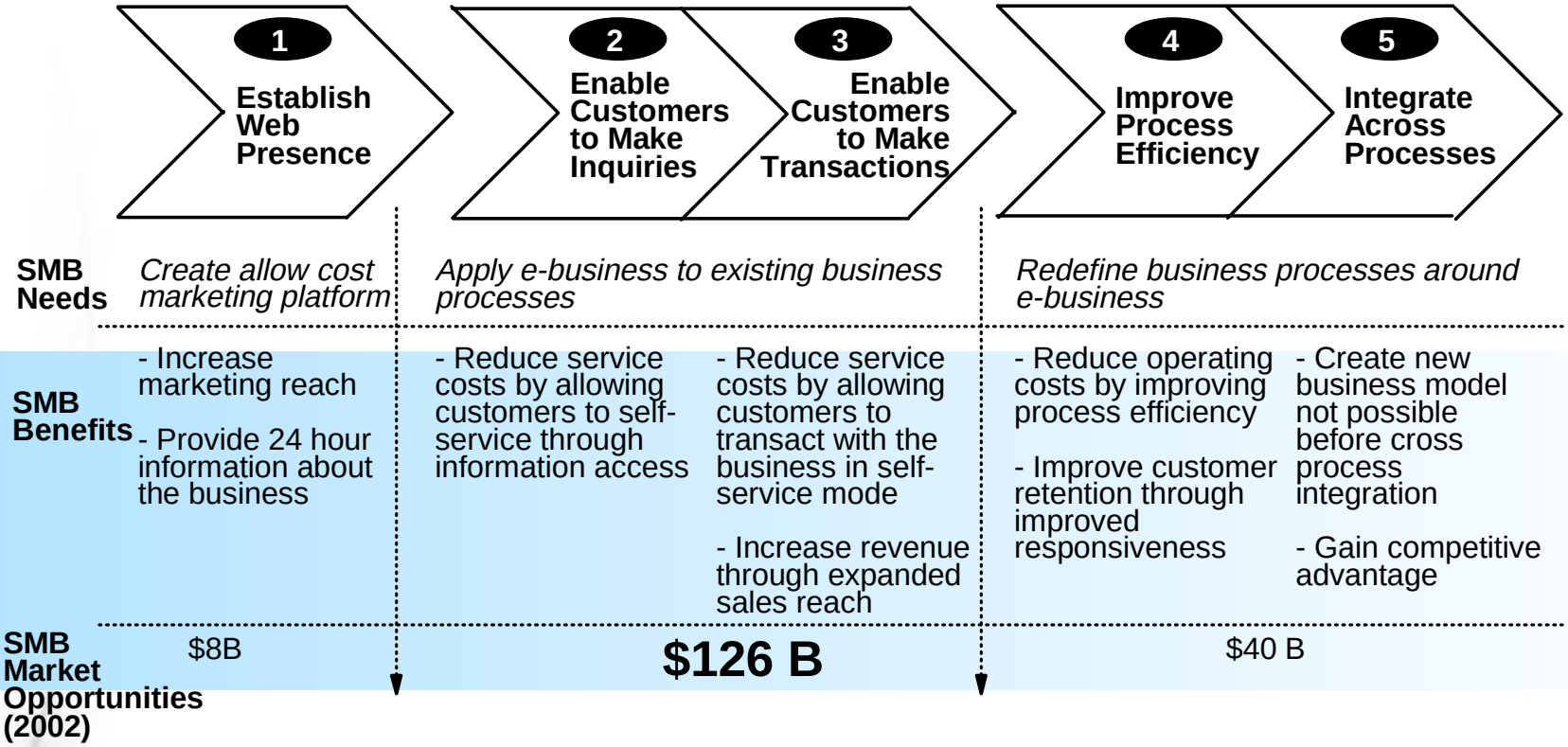
ITEM	Current NHD development	Current non-NHD development	Interest, no current development
1. DEFN	Software Development	none	Tivoli, CS390
2. SCHEMA	CC5 (QoS, VPN)	CS390	Tivoli
3. LDAP	CC5	CS390, AS400, AIX	Tivoli
4. PDP	CC5	CS390	AS400, AIX
5. COPS	none	none	none
6. PEP	CC5, software only hardware ?	CS390	AIX
7. SLMM	Proprietary in absence of Stds. (SNMP MIBs 5/99)	none	Tivoli



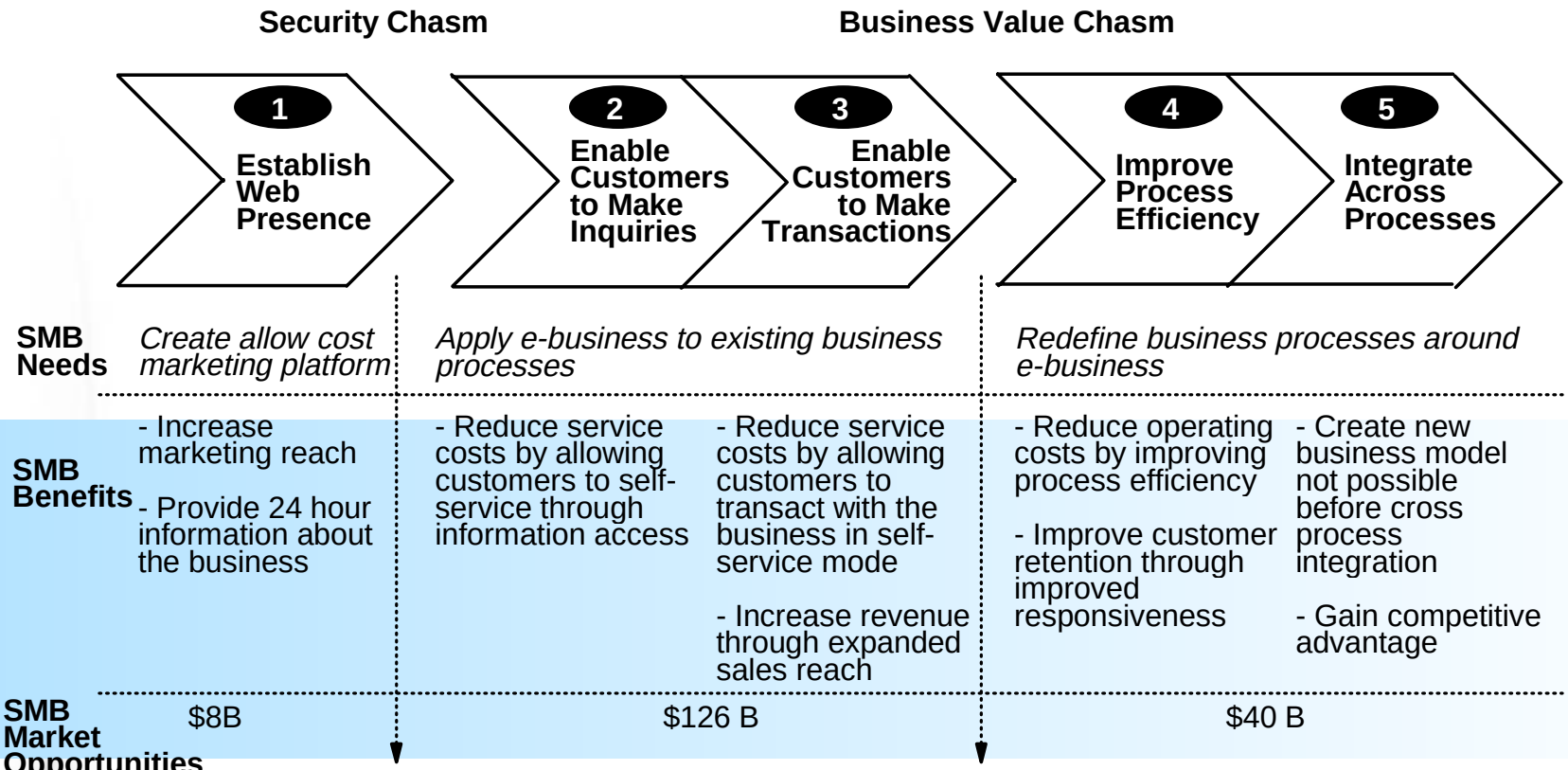
- Leadership opportunities...
  - Ease of administration
  - Planning Tools
  - Policy Enforcement
  - End to End Scope
- Leverage with Services

IBM

What's *Hot* with SMB Customers



What's *Hot* with SMB Customers



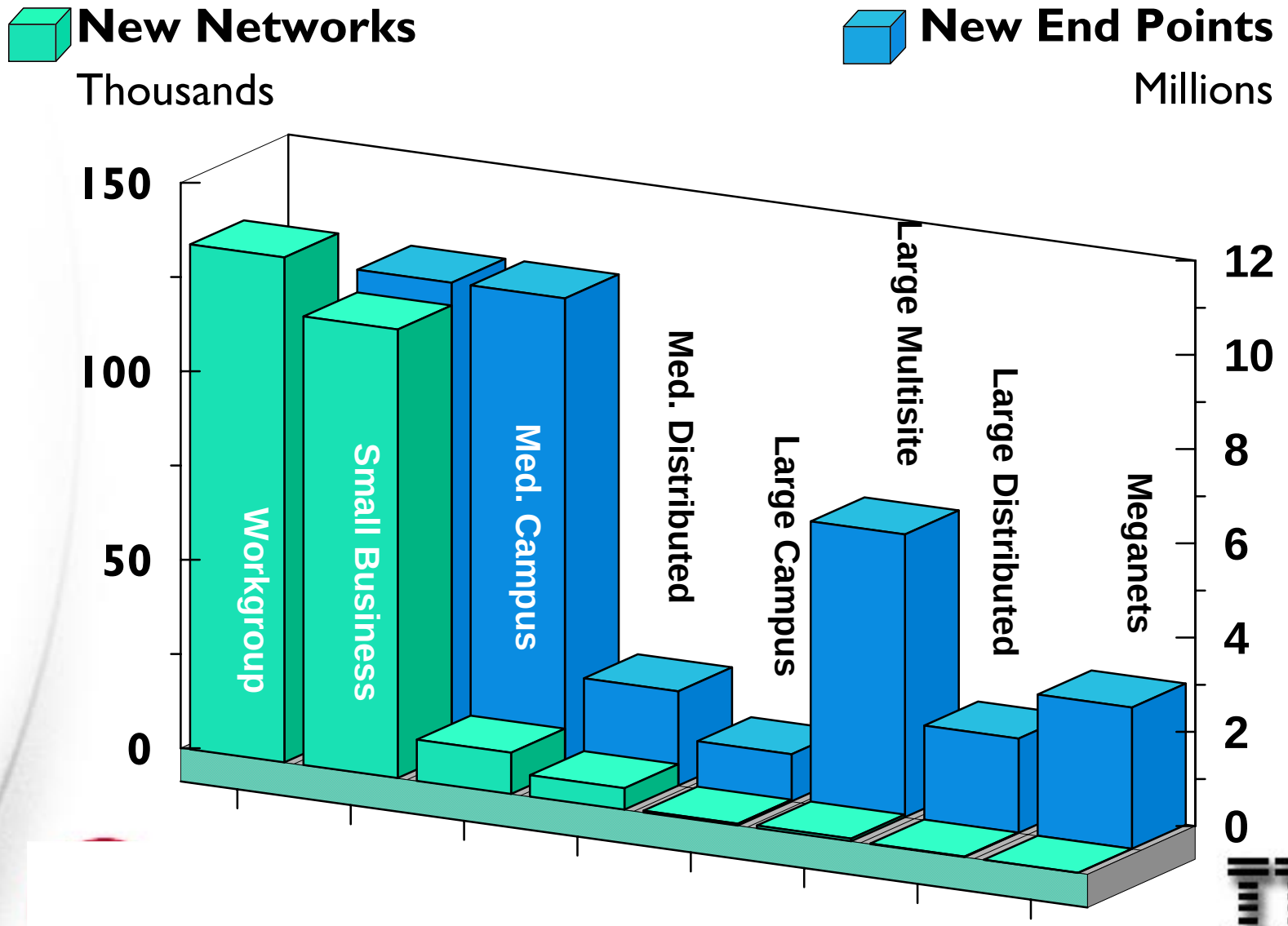
Crossing the Security Chasm

SMBs must be convinced that sufficient security exists before giving customers access to critical business functions

Crossing the Business Value Chasm

SMBs must be convinced that the value received by redefining core business process exceeds the cost of implementation

The Explosion of New Small Networks



January Announcement Highlights

Layer 3 Switching: 8371

- Best ATM backbone solution with 8265/MSS
  - Leadership MPOA for both IP and IPX
- Next step in End-End Ethernet strategy
- Price attractive
- Ease of configuration ... "self learning IP" for router off-load
- Initial positioning as MPOA client or router offload
  - Release 2 router replacement

IBM

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Access Utility (2212): New entry model

- Price 50% off - $6K to $7K average
- Small package is a great fit with AS/400
- More than traditional "networking"
  - Server balancing, thin client.
- Futures ... flexibility

IBM

The Strategy

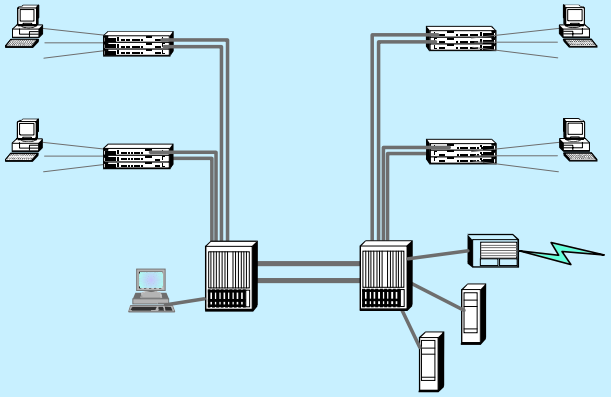
Accelerate NHD growth in a rapidly growing industry

- **Customers**
  - Strengthen relationships and business with large enterprise customers
  - Expand business with small and particularly with medium-sized businesses
- **Sales channels**
  - Broaden Business Partner channels for small and medium businesses
  - Focus direct sales force on key enterprise customers
- **Technology**
  - Expand solutions for low-end Ethernet, high-end Ethernet/IP, backbone ATM
  - Enhance migration/growth paths for SNA and Token Ring customers
- **Cost and Expense**
  - Reduce cost, expense; improve delivery, usability, support, serviceability
- **Year 2000**
  - Drive business in first half of 1999 anticipating slow down in second half

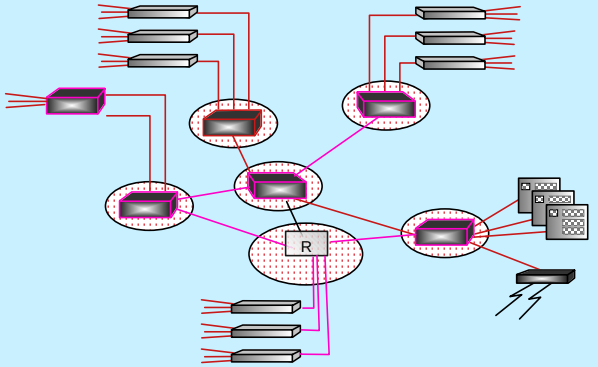
IBM

1999 Solutions Focus

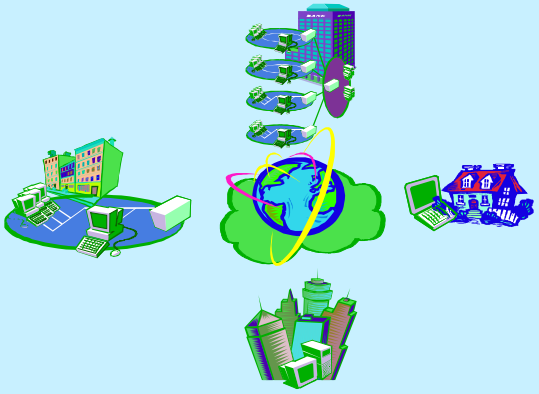
ATM Backbone



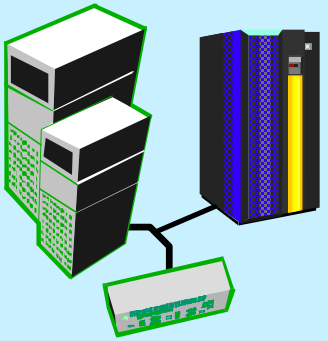
Ethernet Backbone



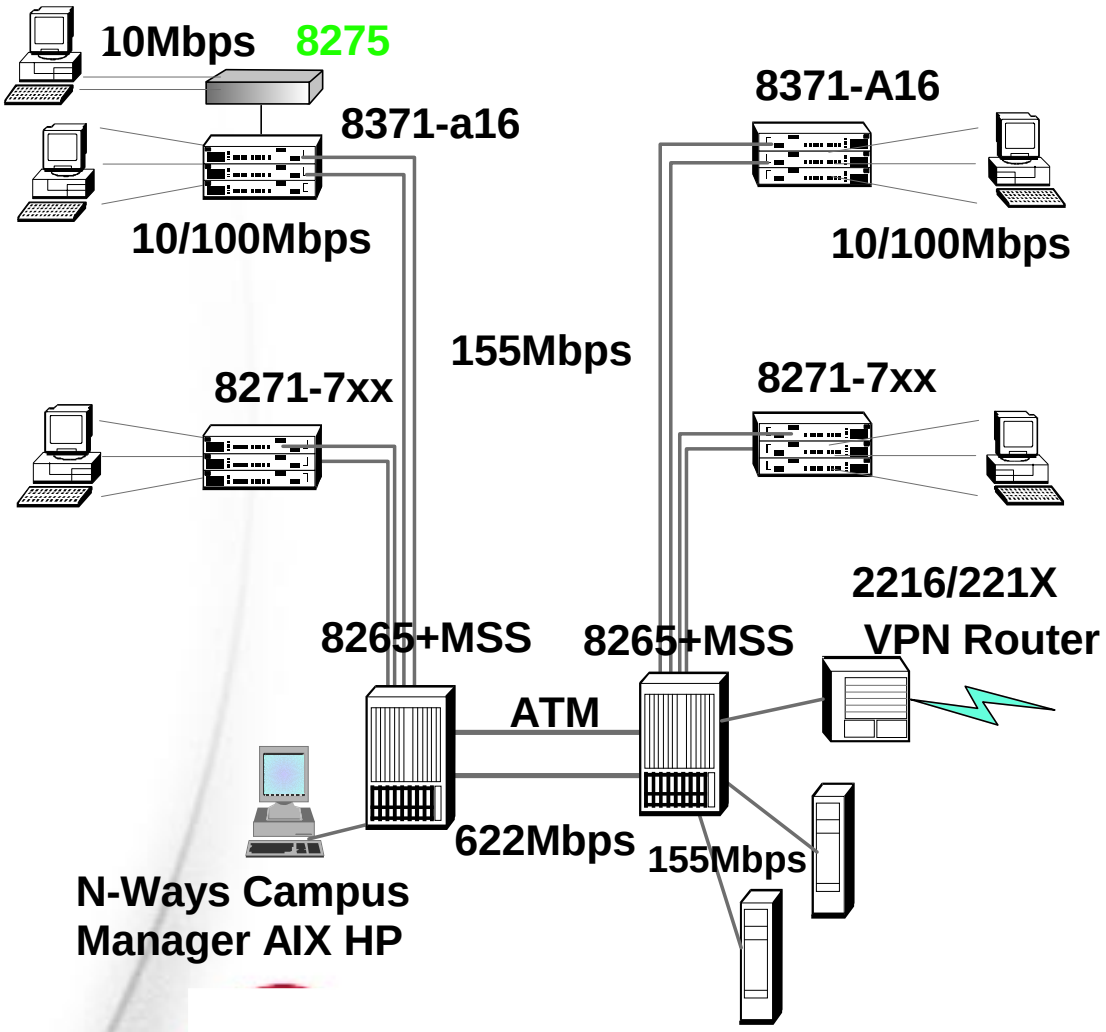
WAN Access



Server Access



1999 Solutions Focus:
ATM Backbone



- **8210/MSS**
  - R2.2
  - 8210 Model 3
- **8265**
  - Vega Blades
- **Evolution to OC48**

January 1999:

The Beat Goes On

INTERNETWEEK

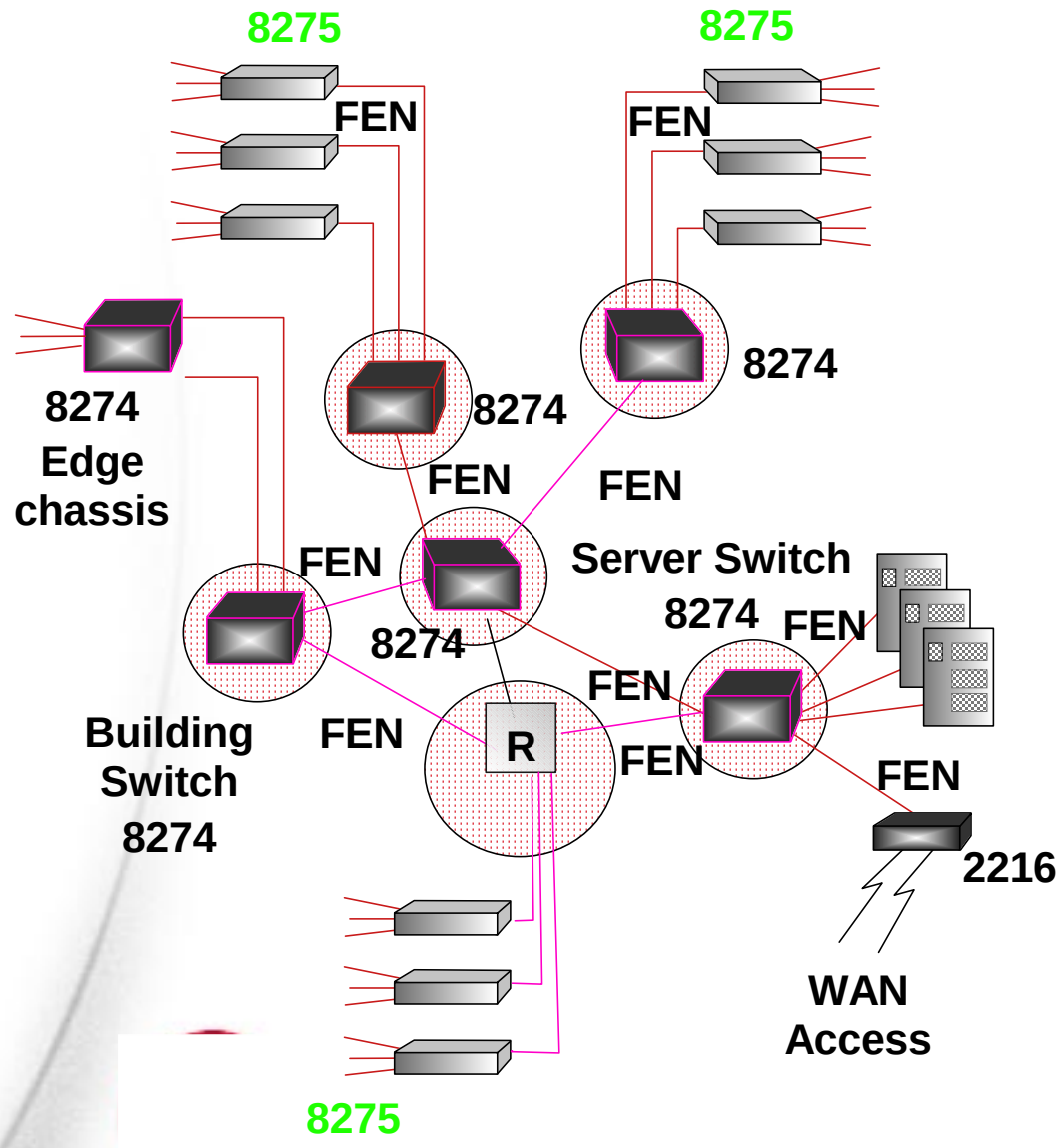
February 1, 1999

Ethernet Turns Familiar Shade Of Blue

"This is IBM's big commitment to Ethernet being a major player in the market," said Gerald Riley, systems engineer for network services at Mutual Life of Canada... **"This plays into my hands nicely and gives me the MPOA (Multiprotocol over ATM) Ethernet client I need," he said.**

IBM

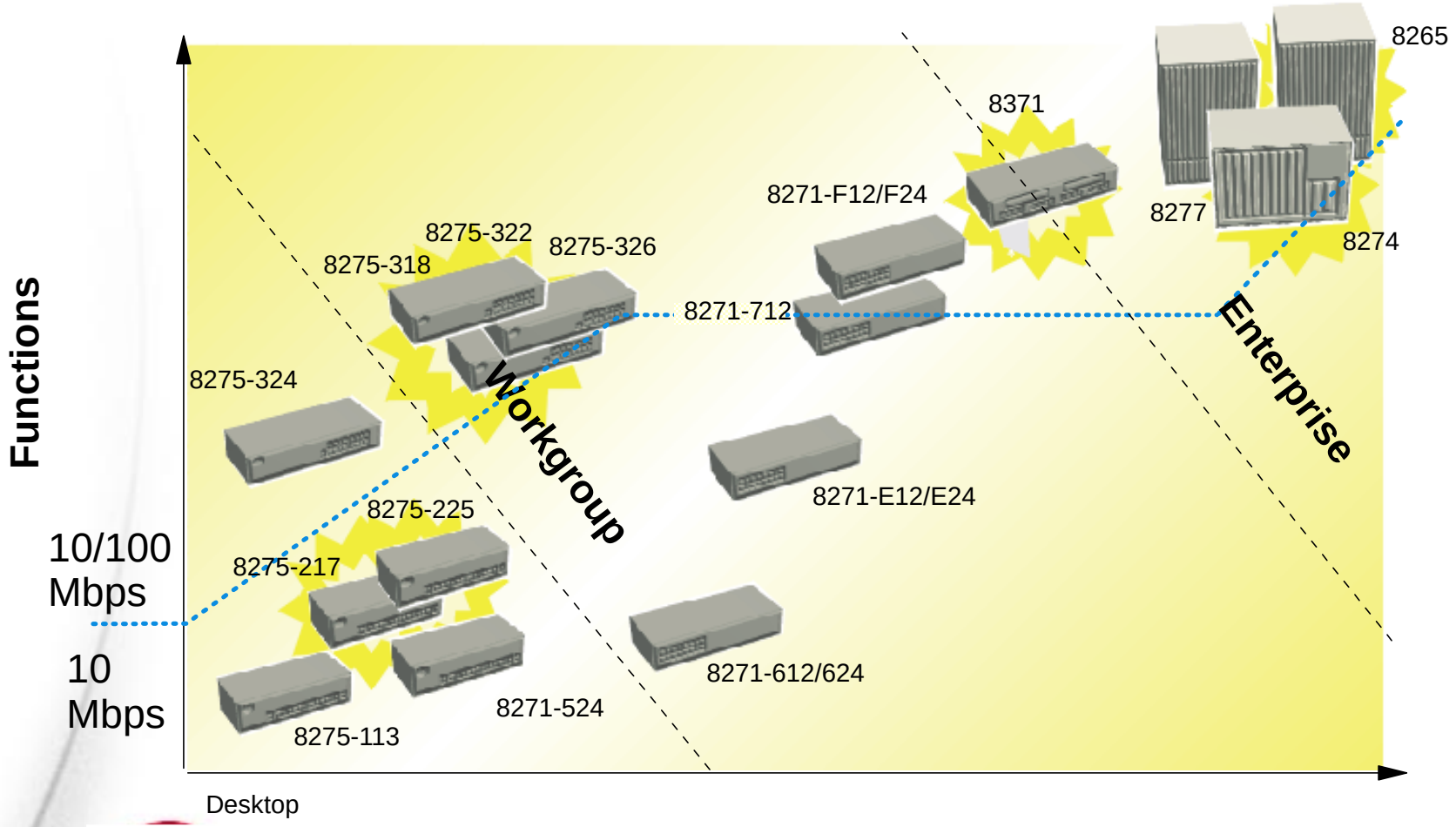
1999 Solutions Focus:
Ethernet Backbone



- **8265**
  - Vega Blade
- **EN Switches**
  - 8274 GRS
  - 8271
  - desktop switches
  - workgroup switches
  - backbone switches

March 1998 - March 1999:

15 Ethernet switches in 12 months



Rapidly Expanding Ethernet Solution Set

IBM

January 1999:

The Beat Goes On

NetworkWorld

January 25, 1999

Ethernet has always been somewhat the bane of IBM's existence, but Big Blue is finally coming around.

... Curtis Blais, network specialist at Telus Communications, a large company in Edmonton, Canada that uses Ethernet and Token Ring, says **he's happy to see IBM finally get serious about Ethernet. "IBM is no longer only a Token Ring vendor," Blais says.**

IBM

January 1999:

The Beat Goes On

PCWEEK

January 27, 1999

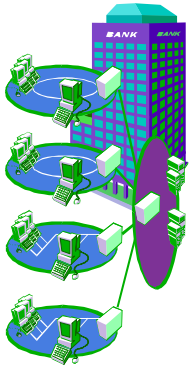
IBM cranks up Ethernet push at ComNet

IBM's Networking Hardware Division introduced new high-performance networking gear here at ComNet '99 this week that **makes good on its strategy to become a significant Ethernet provider and builds on its ATM history.**

IBM

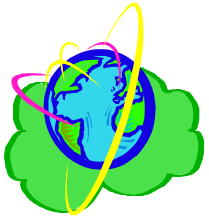
1999 Solutions Focus:
WAN Access

Scaleable, High-speed Access to Mission Critical Applications



Wide Range of Standards-based Connectivity Options

Simpler and Easier



Low-cost, Secure Communications

Travelers, telecommuters, and mobile workers

Protection From Intruders

Full Support for New e-business Applications

- 2210 evolution
- 2212 evolution
- 2216 evolution
  - capacity
  - voice over frame
  - voice over IP

September 1998:

The 2212 Access Utility

September 1998:

The 2212 Access Utility

COMPUTERWORLD

September 21, 1998

Feature-rich IBM router to make debut

Users stand to gain **sorely needed versatility in one branch office box** with IBM's introduction this week of **a feature-rich router, the first to let remote sites boot up thin clients.**

IBM

December 1998:

The 2212 Access Utility

AberdeenGroup

Impact

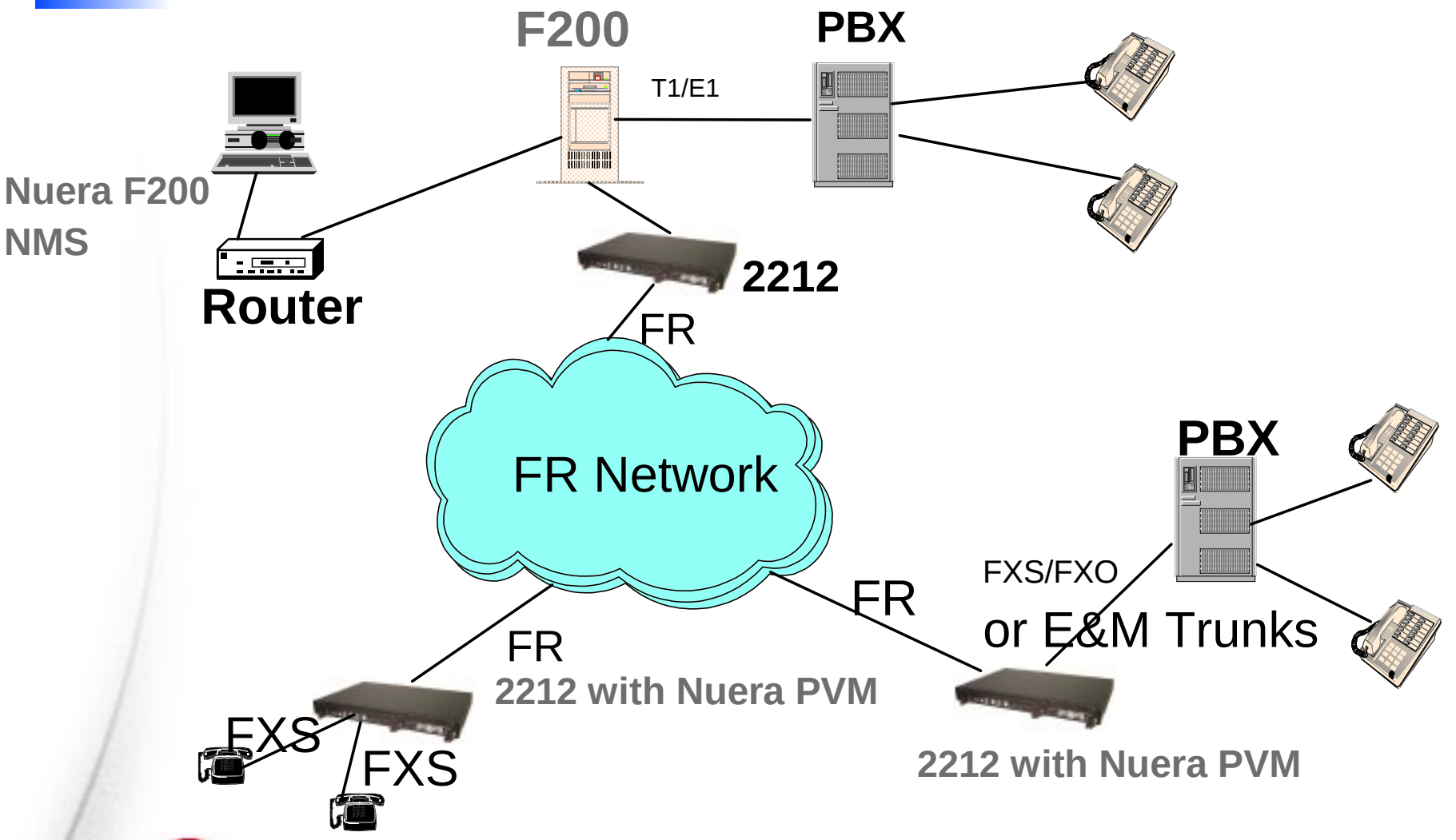
December 22, 1998

IBM 2212 Access Utility: Ready, Set, Grow!

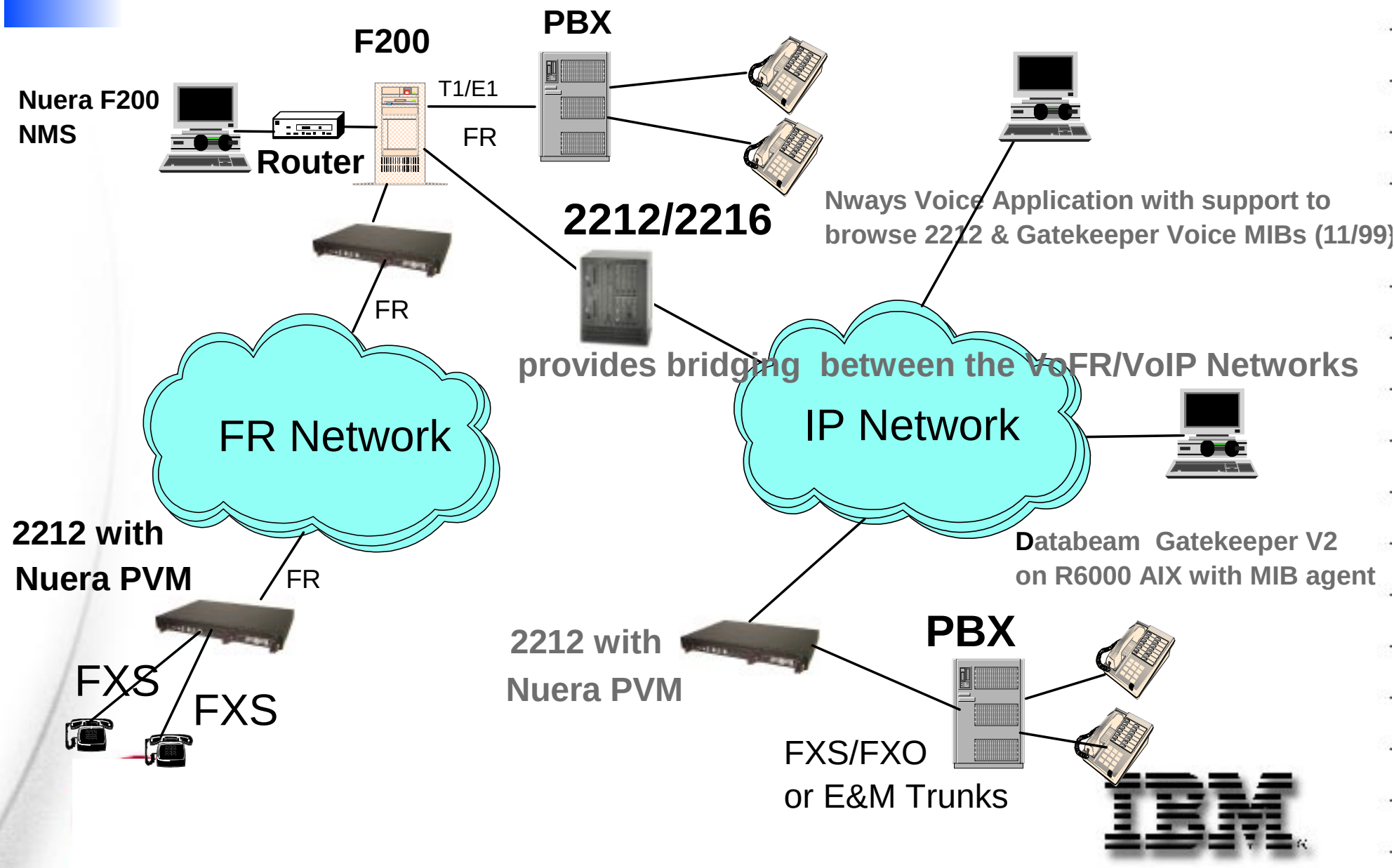
The IBM 2212 Access Utility feature set offers the performance, flexibility and ease of installation called for to meet today's and tomorrow's branch offices needs, and should be on the short list for remote branch access solutions.

IBM

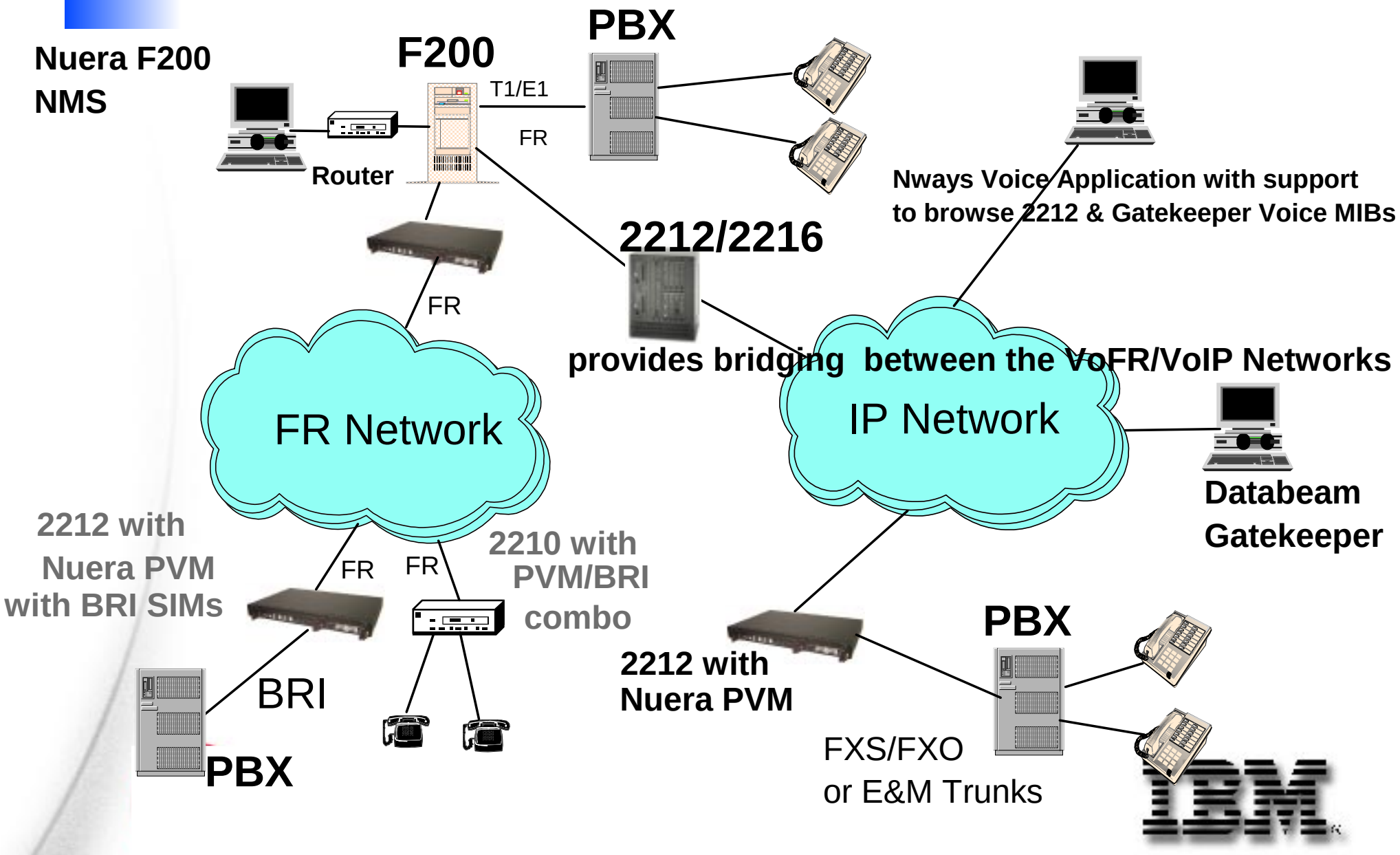
Voice Network - 6/99



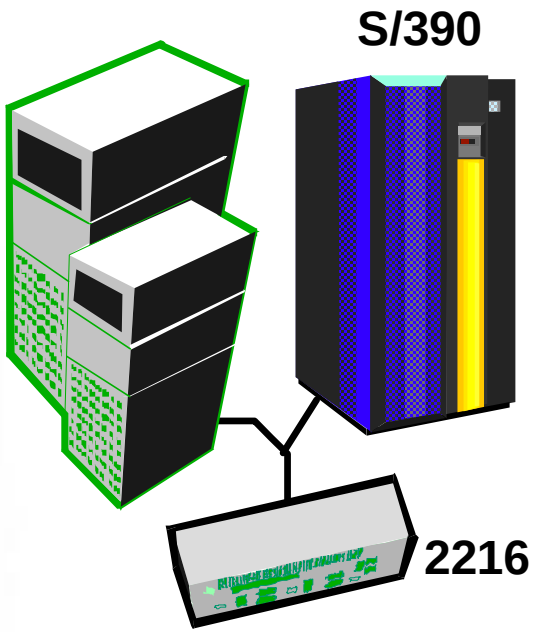
Voice Network - 9/99



Voice Network - 12/99



1999 Solutions Focus:
Server Access



- NCP evolution
- 37xx evolution
- 2216 evolution
- Layer 3/4 switches

- Industry leadership benchmarks
- Enhanced caching capabilities - reduced cost
- Enhanced SNA IP integration - 2216/NU/37xx/MAE
- WEB Server Growth - Layer 3/4 Gigabit switches
  - High-speed dedicated LANS - server clusters
  - Increased intelligence at the network edge

Networked for e-business

Computer Reseller News
For Providers of Technology and Information Solutions
www.crn.com

October 12, 1998

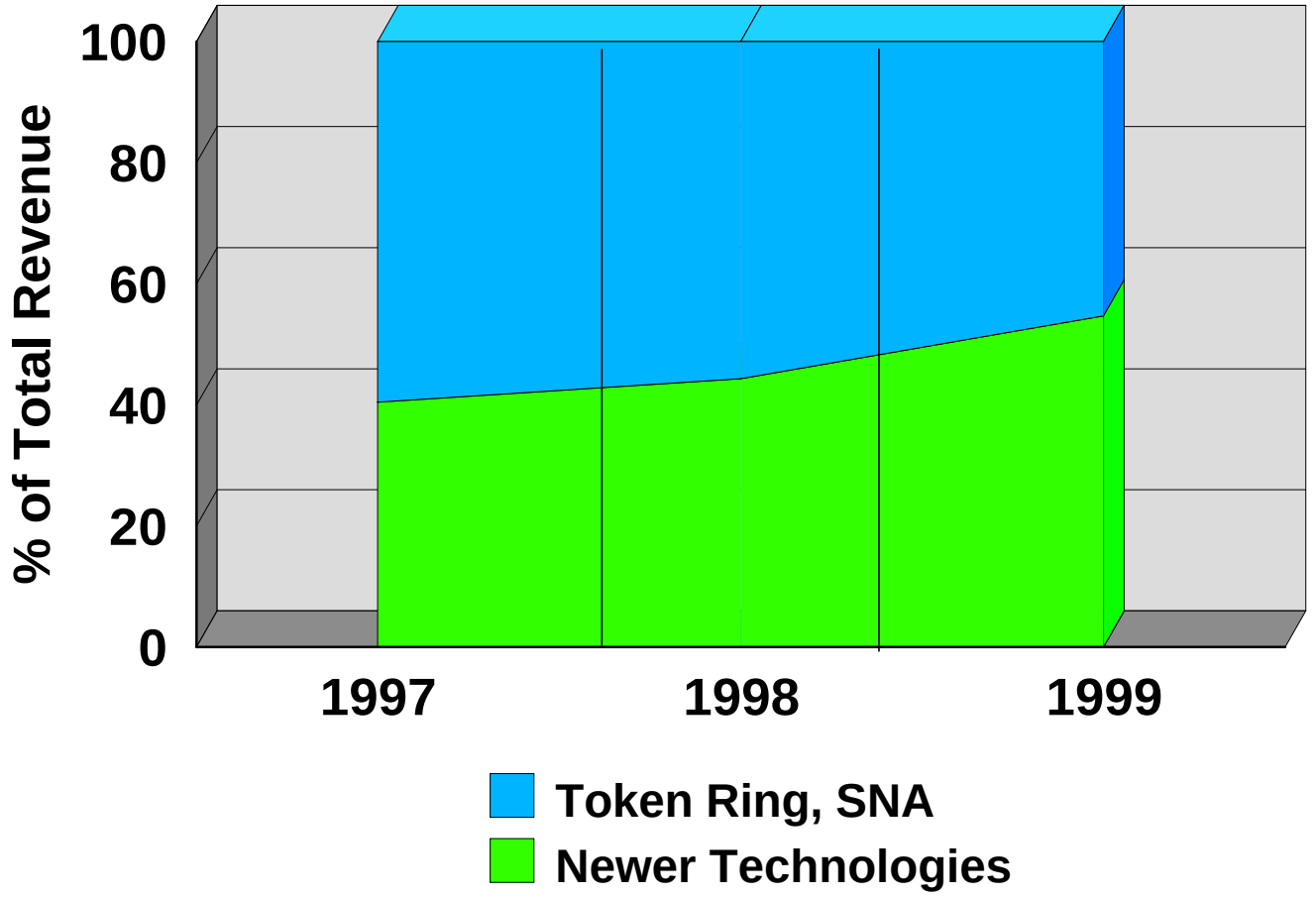
Sam Alunni
Vice President of Networking
Sterling Research

IBM: Network Products Are The e-business Backbone

(If IBM takes) "their topnotch network equipment and bundle it with systems and e-business applications, they have a strong advantage over their competitors"

IBM

1998: Crossing into "new" areas



Industry Transformation

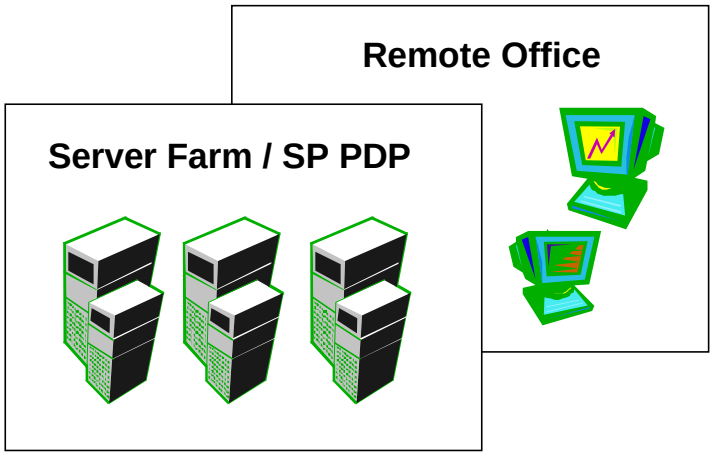
Traditional

"Infrastructure" = Networking Hardware

Emerging

"Infrastructure" = Both vertical & horizontal Integration

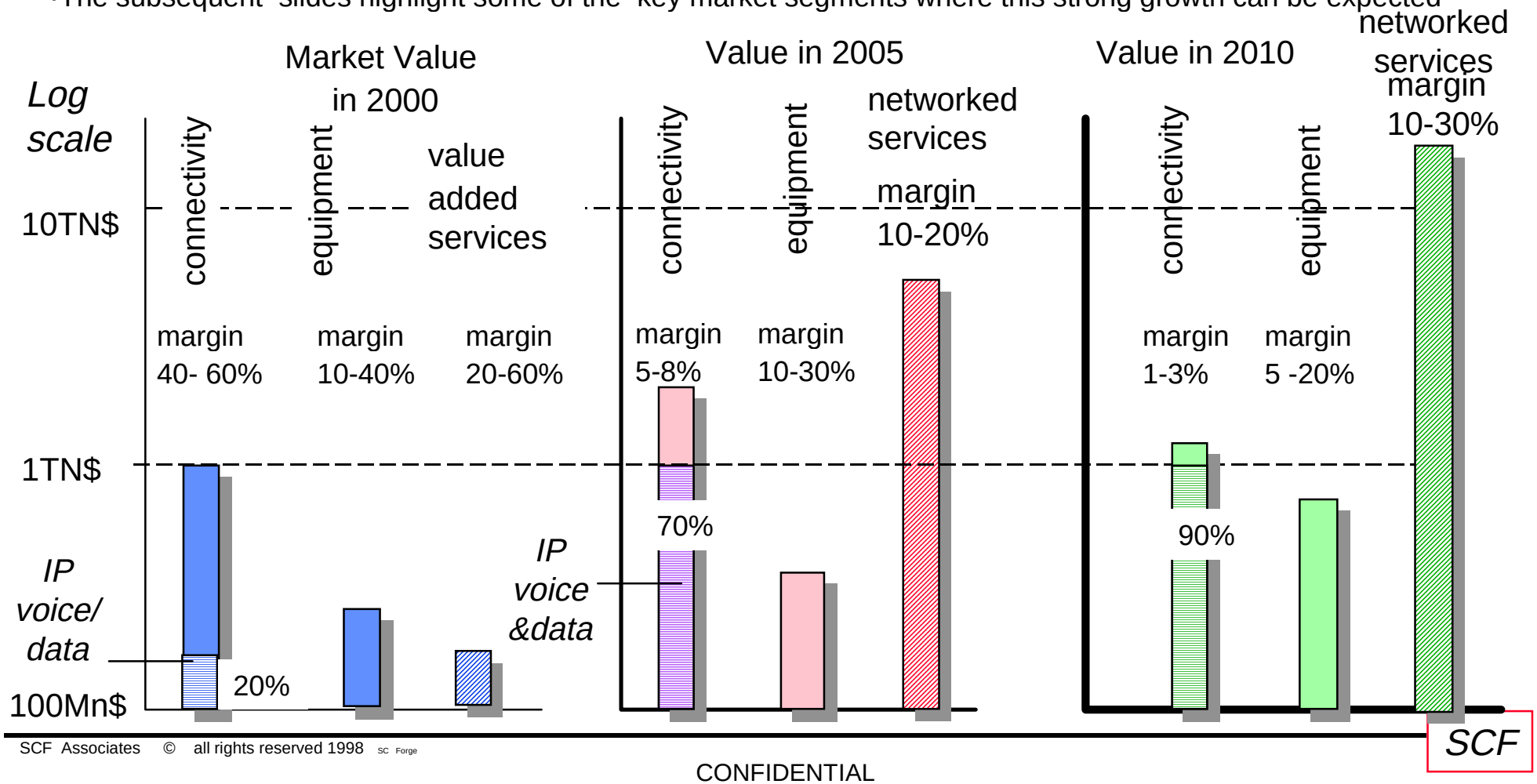
- Networking
- Servers
- Storage
- Software



IBM

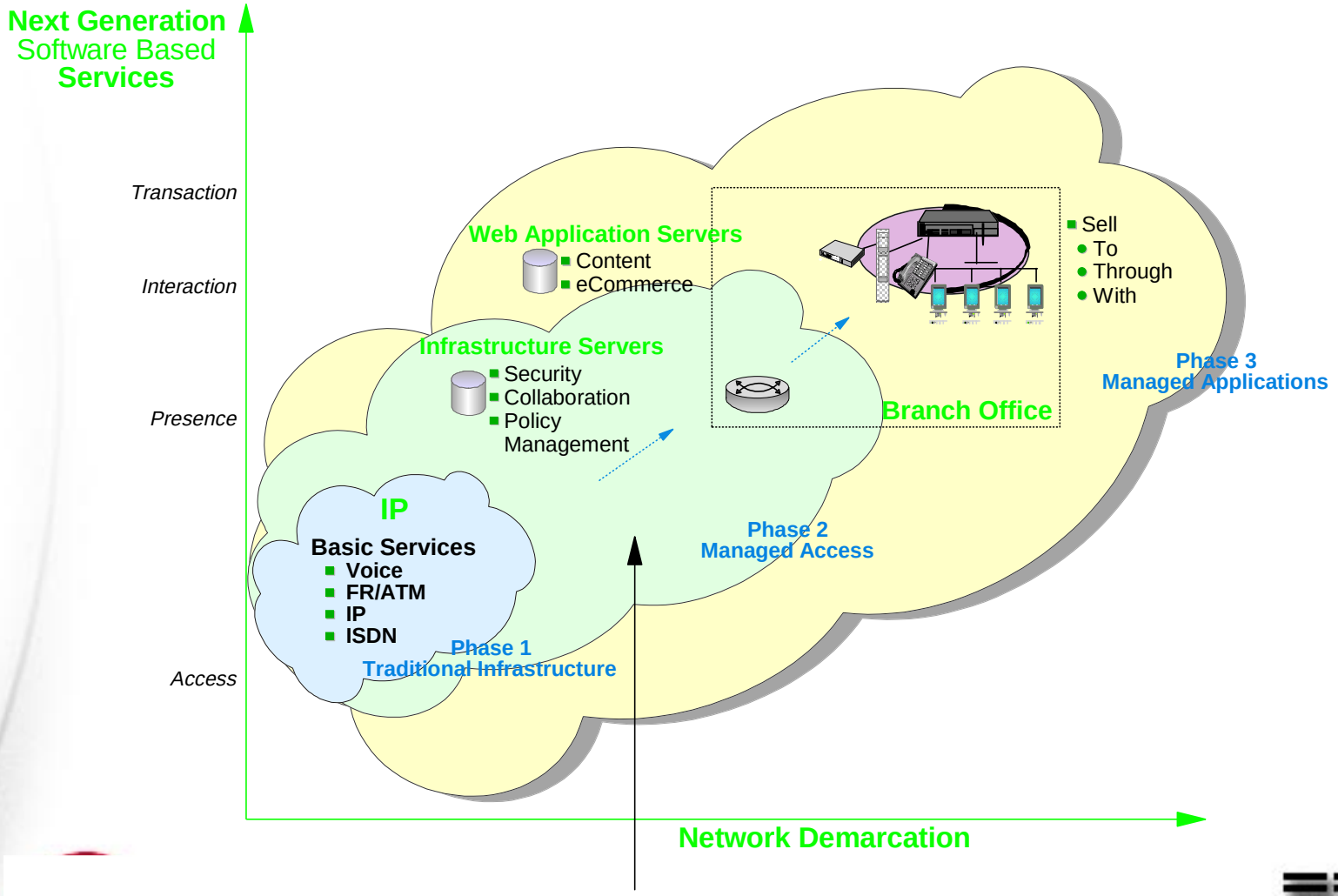
In tomorrow's Markets, where the margins are

- Where the money can be made changes from local and long distance connectivity into higher value services which happen to use a network for delivery - as connectivity margins go over a cliff
- Equipment margins also shrink as a next generation of equipment vendors - smaller, more agile, competitive, progressive - sell new 'telecoms-lite' equipment at minimal margins but in high volumes
- The subsequent slides highlight some of the key market segments where this strong growth can be expected



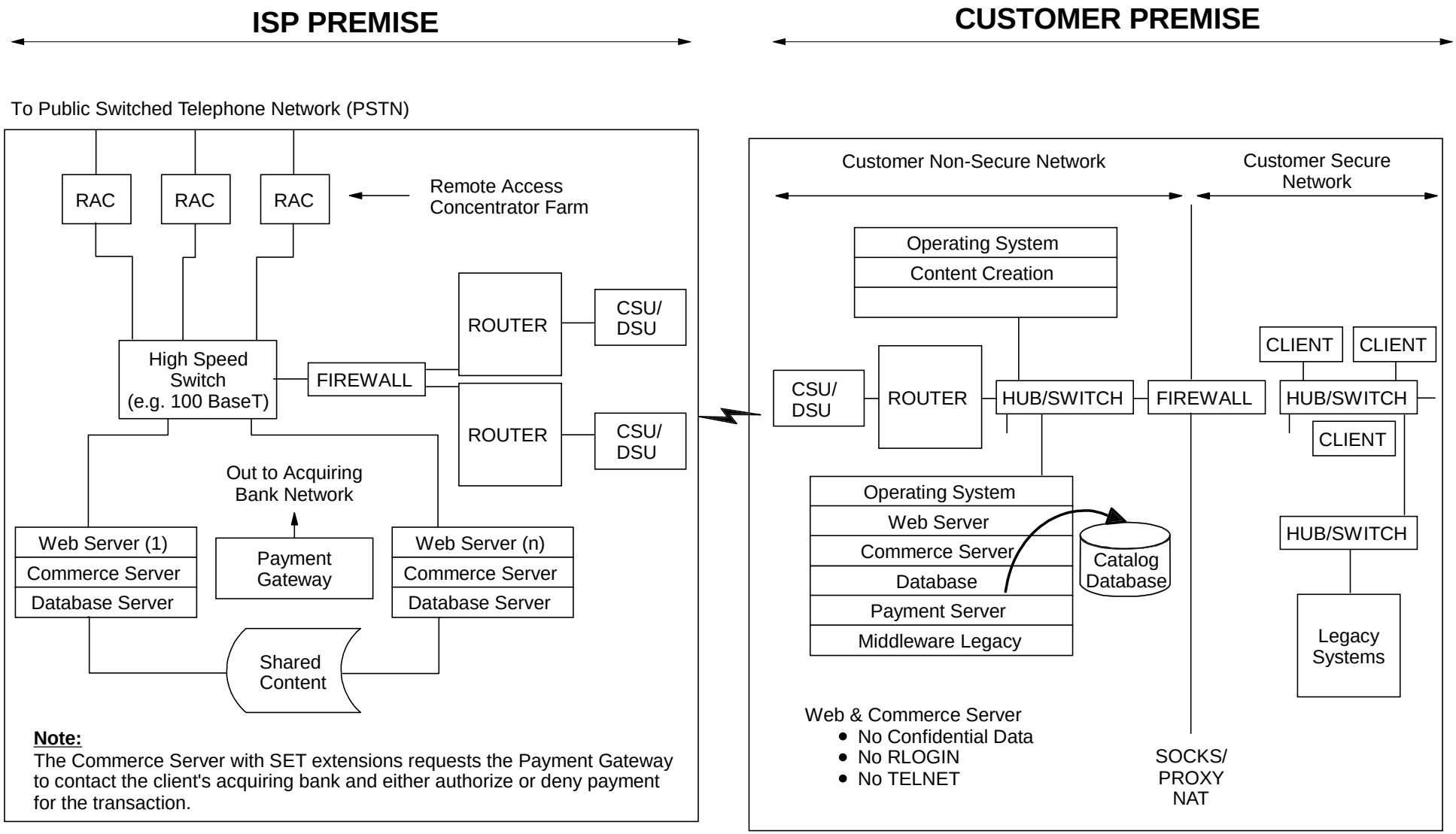
The Evolution of Managed Services

Increasing Customer Value and Profit from the Data Network

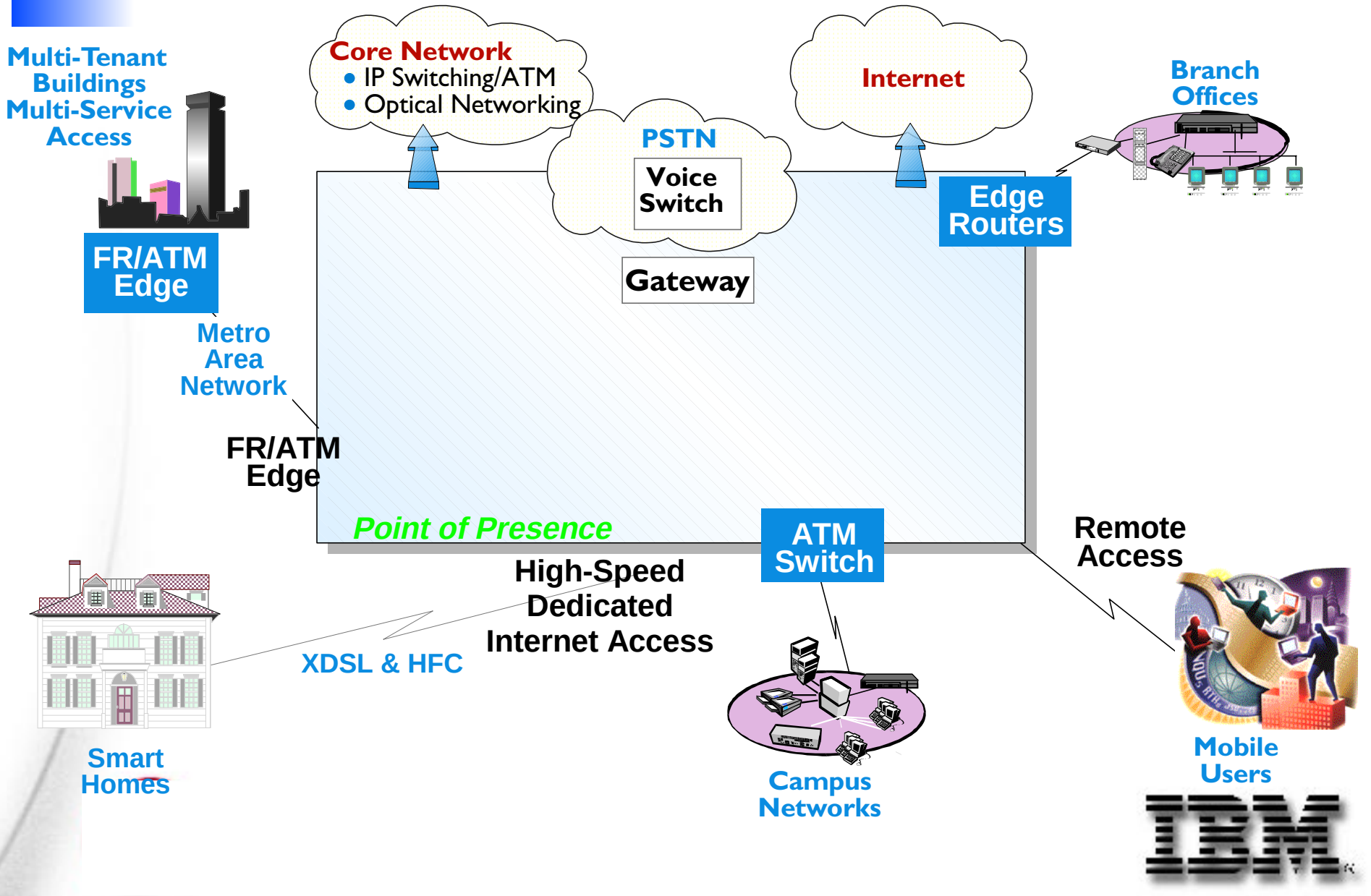


'99 revenue growth opportunity with NTT, C&W, Sprint

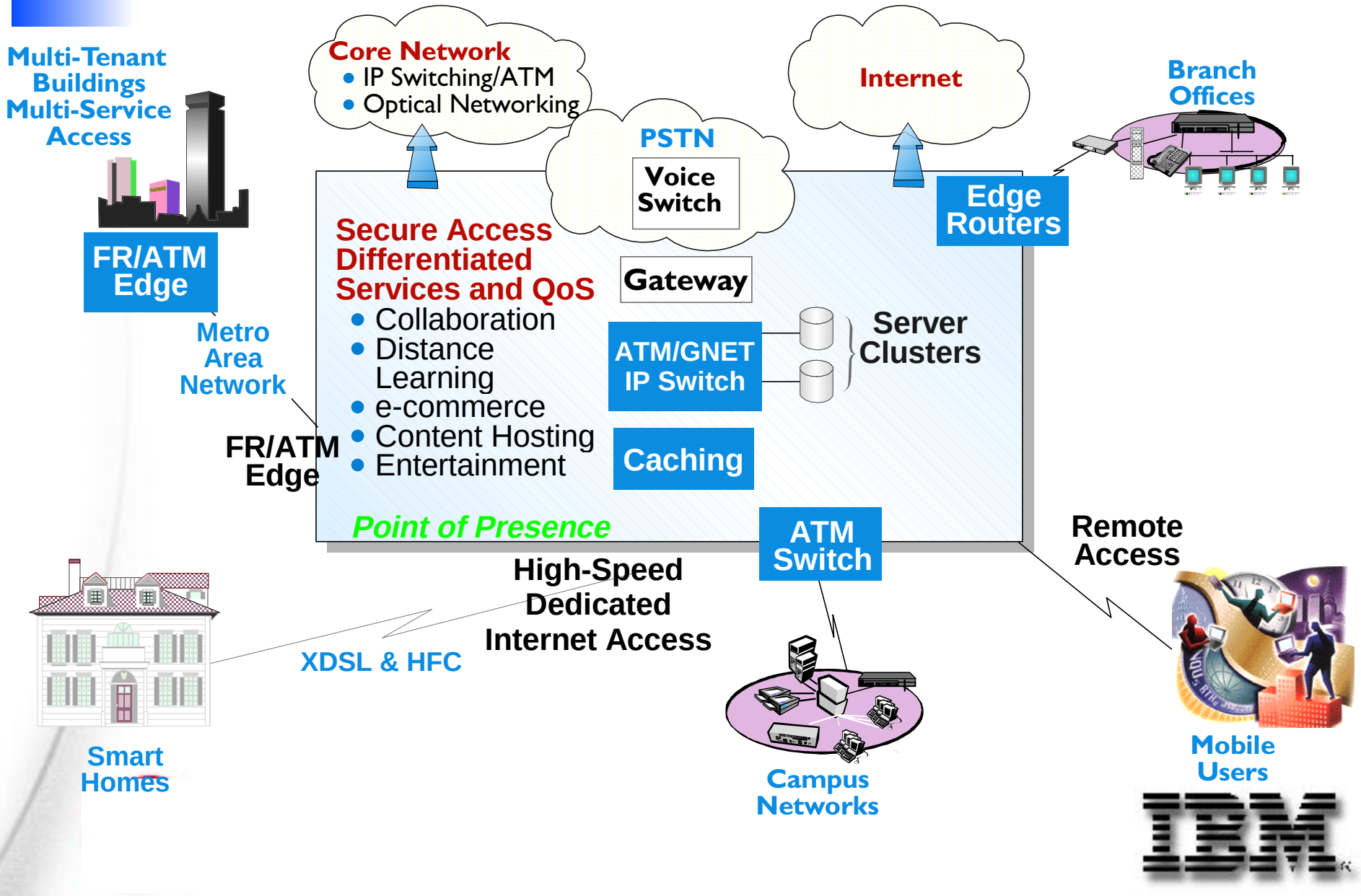
Platinum Class Service Offering -
Access + Presence + Catalog + Order + Payment + Dynamic Transactions

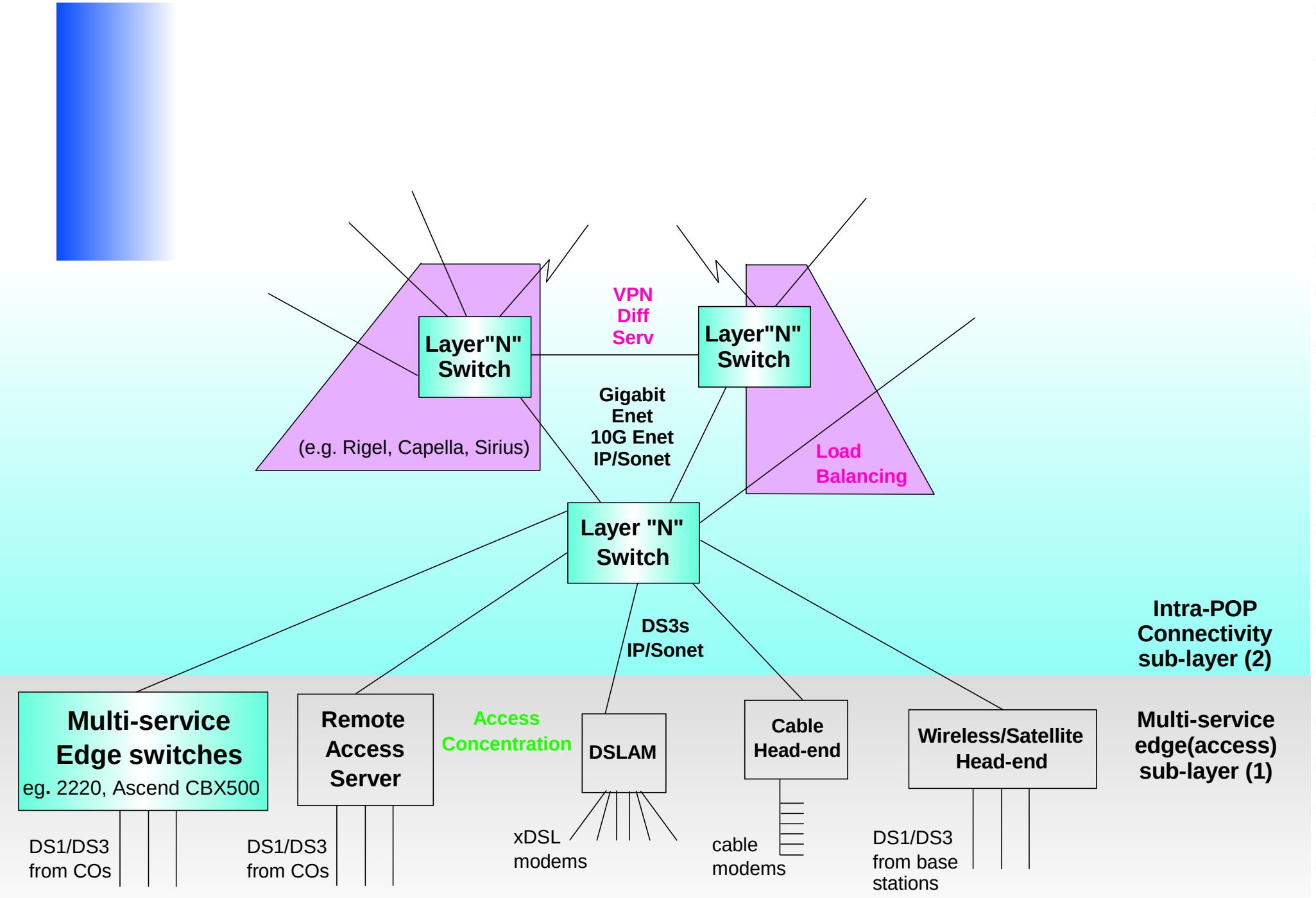


Current Service Provider Infratructure

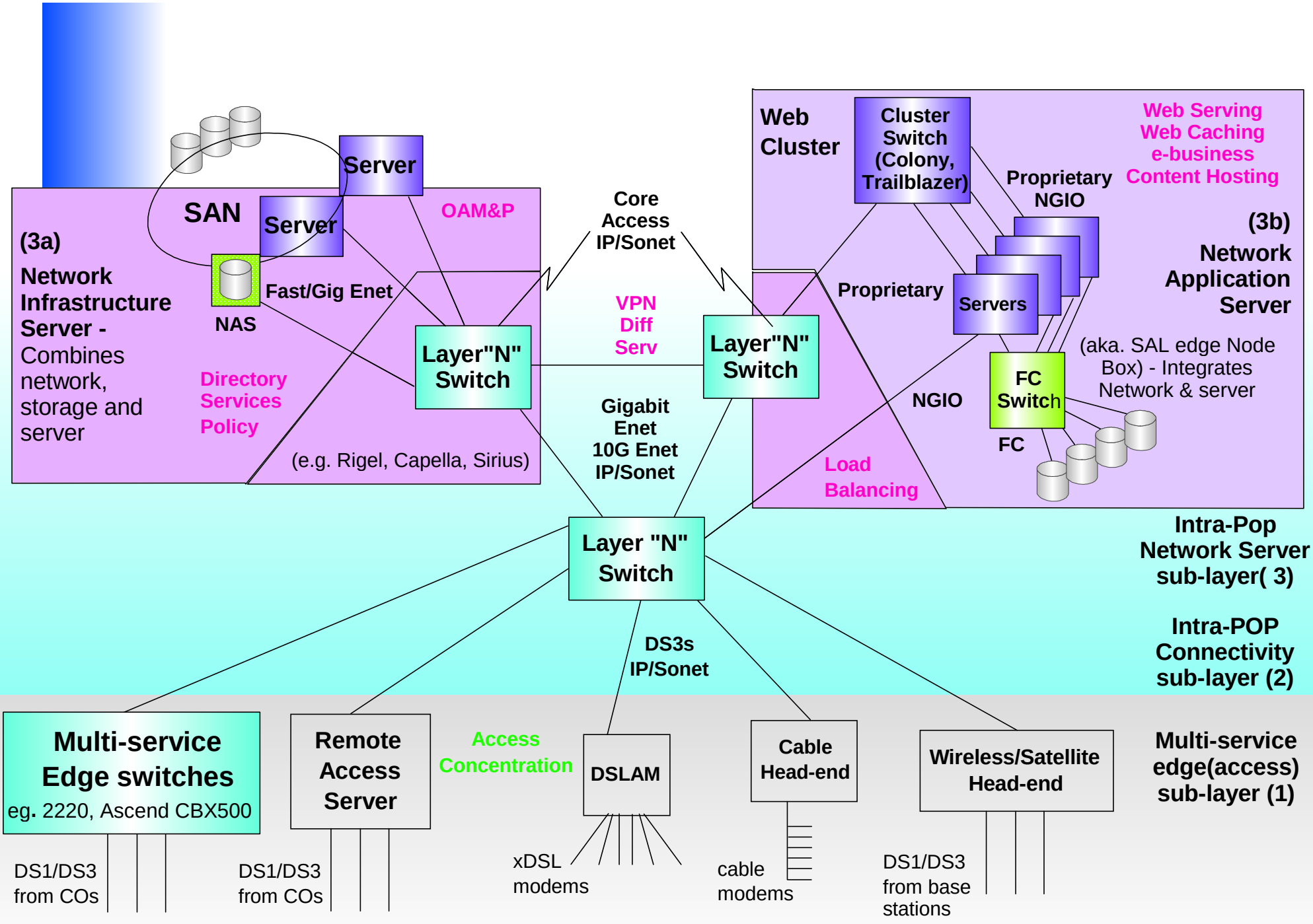


Broadband Application Infratructure



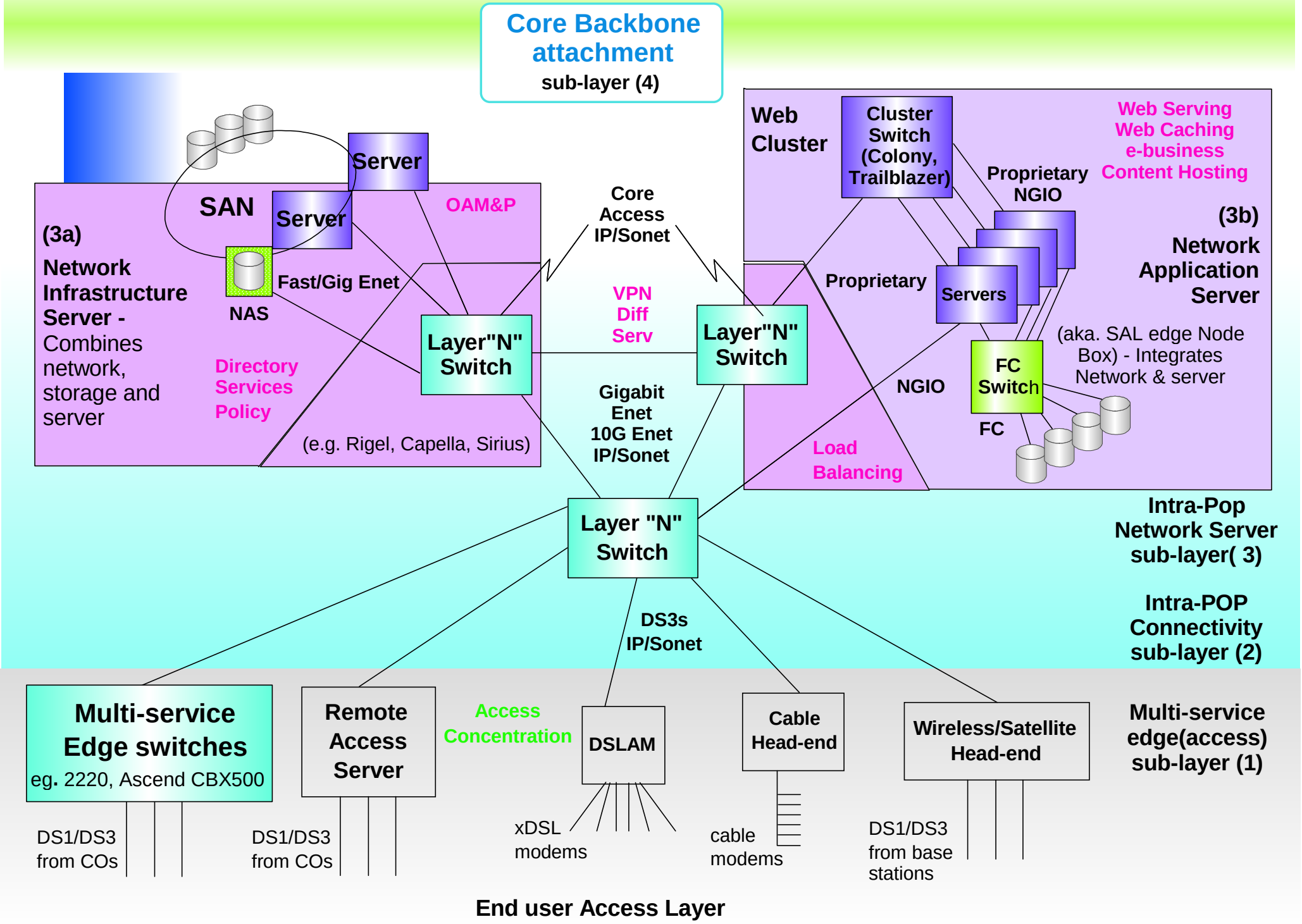


Ganek's End user Access Layer

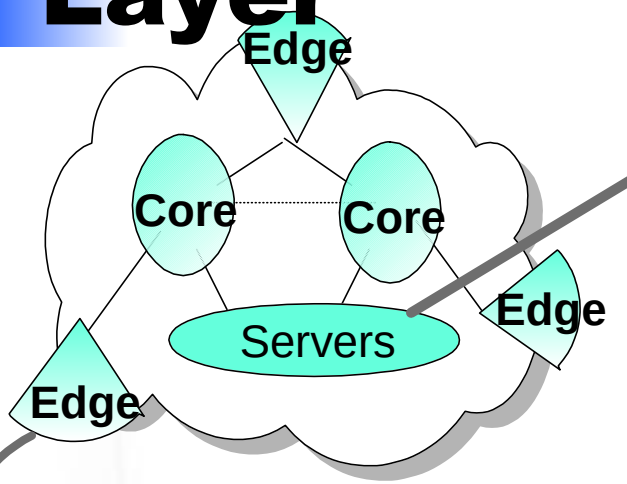


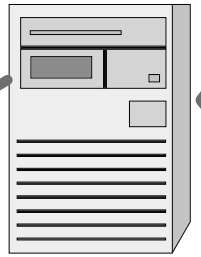
Ganek's End user Access Layer

SAL Network Model (PoP of the Future) IBM Infrastructure Products



Inside the Service and Application Layer

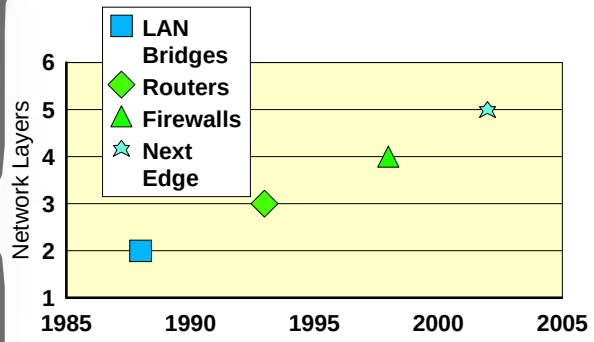




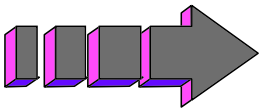
- Discrete Applications --> subscriber management, access control
- Intra-industry applications --> databases for sharing info
- Business Applications --> ERP, SCM, CRM
- Network Applications --> directory servers, mail, web
- Multimedia --> audio/video servers
- Adaptive "impedance matching" --> e.g., campus to SAL

Edges

- Edges have evolved over time



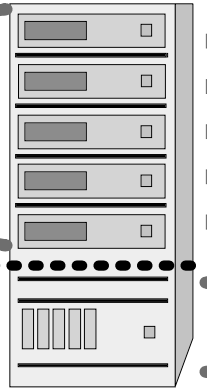
What is the next edge?



- Address specific customer needs
- Start out as software implementation on general purpose hardware; move to custom hardware then silicon

Edge box

Closed-box Servers



- IP telephony gatekeeper
- Caching & content cntrl
- Directory
- Security & quality of srvc
- Network Management

API

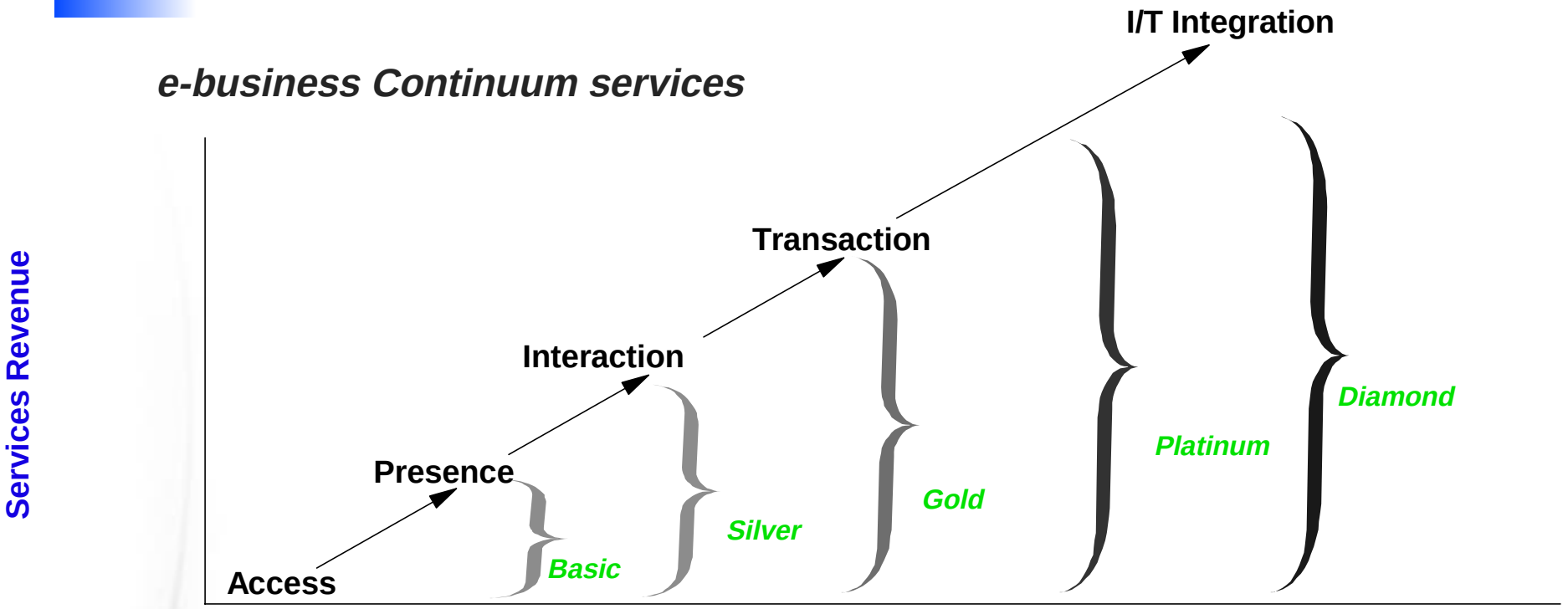
switch/router

Do not expect a dominant bundling, but rather a set of them

$110B of Networking Hardware Opportunity

Opportunity	Competitor (Example)	Layer in Model	WW Oppty Y2002 est
1. OEM components	Intel, TI, Motorola	Core/SAL/ User Access	$70B
2. Infrastructure Products: (e.g., HW/SW network switches/gateways)	Cisco, Lucent	SAL (Products)	$40B
Servers & SW for networks (e.g., customer mgmt, caching, policy, directory, packet telephony)	No entrenched competitor	SAL (Products)	$15B
Network management tools	No entrenched competitor	SAL (Products)	$5B
3. SAL Solutions: Applications/Servers for e-commerce/portals	Sun, Compaq, HP, MS	SAL (Solutions)	$75B
4. Services as a SAL: (e.g., outsourcing, super POP, VPN)	Worldcom, AT&T, AOL	SAL (Services)	$45B
5. Wireless & Mobility: (incl: technology, products, services)	Wireless: Nokia, Ericsson Mobility: no ent. comp.	User Access	$110B

Leveraging Services in '99



e-business application example	Catalog	Order / Payment	Inventory Availability	Supply Chain Management
SMB benefits	Establishes a new marketing channel	Permits customer self-service	Enhanced customer service	Gain competitive advantage
Level of Complexity	Low	Medium	High	Very High

IBM Leadership: Tying it all together

Strategy Development: Feb 8 IRB Agenda

Objectives & Overview (15 min.)	Rob & Michel
Reality Check : Solutions Overview & Gap Anaysis (2 hrs.)	Gene C.
Reality Check: Development (30 min.)	Michel M.
Reality Check: Channels/Route-to-Market (1 hr.)	Nallu R.
Leadership Opportunities (1 hrs.)	
– Products	Chuck S.
– Markets	Rob Z.
Lunch	
Division Strategic Scenario's (2 hrs.)	Michel & Rob
Funding (1 hr.)	Michel M.
– WAN Switching, Solution holes	
– Flagship scenarios, OEM, Marketing	
Organization (30 min.)	Reena M.
Open Discussion	

The Two-Page Summary

Page One: The Strategic Focus

Targeted customer segments/solutions

- **Enterprise Customers**
  - Intelligent high-speed LANs
  - Campus migration to Layer 3/4 Switching
  - Policy Management infrastructure
- **Medium Office Solutions**
  - 'All-in-one' LAN/WAN access and access routers
  - Low-end Ethernet LAN switches
  - Bundled with IBM Servers (e.g. AS/400, Netfinity)
- **Managed Services (Telco/ISP)**
  - Enterprise IP/SNA migration to public Frame Relay & VPN's
  - Access products for VPN's (including VoIP & e-commerce solutions)

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The Two-Page Summary

Page Two: The Growth Strategy

Growth in ATM Solutions: NHD #1 in AP Market

- **IBM Layer 3 switch : 8371 and blade for 8265**
  - Complete MPOA model with competitive pricing
  - Leadership in Ethernet/ATM multiprotocol solutions with evolution to OC48
  - New 'self learning IP' functions provide ease of administration

Expansion of Ethernet Solutions

- **Delivery of complete IBM solutions in 1999**
  - From a NIC to Gigabit Ethernet backbone switches
  - Differentiated through hybrid switching, server access and policy management
  - Delivering "ATM like QOS" to Ethernet solutions
  - IBM Ethernet/IP growth plan of three-times industry in 1999

Medium Business Office Solutions

- **IBM Multi-service / Multi-function : 2212 Access Utility**
  - Power of enterprise networking to the AS/400 customer
  - Voice/Data integration (both for Frame Relay and IP)
  - Strong VPN support
  - More than traditional networking (server load balancing, thin client)

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