Advanced Internet Solutions

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The Internet and the public telephone network are colliding. Where these two large and sophisticated networking environments intersect represents a market discontinuity that requires new categories of equipment. The **Nortel Rapport Dialup Switch** is designed to allow advanced communications service providers and major enterprises to take advantage of the discontinuity with a scalable, high-performance and integrated capability set.

This presentation will discuss the underlying marketplace, the key requirements of this new category of product and positions, and how Magellan customers can leverage their existing investments in high performance ATM and frame relay switching equipment to enable these new services and businesses.

About the presenter:

Peter Brockmann, B.E.Sc., M.B.A. is no stranger to Magellan Networks and Inform. Since joining Nortel in 1989, he has performed various strategic marketing and product marketing roles for Magellan enterprise networking customers and products, both globally and within North America. In 1994, the last time Inform was held in Montréal, he was the Master of Ceremonies and in 1995 he presented a workshop entitled "The Business Case for the Enterprise Network Switch."

Peter won the President's Award for Innovation, the second highest honor within Nortel, for his launch of the Rapport portfolio of Internet solutions in September 1995. He is based in Nortel's Richardson, Texas office where he is senior manager, Internet Solutions Market Development.
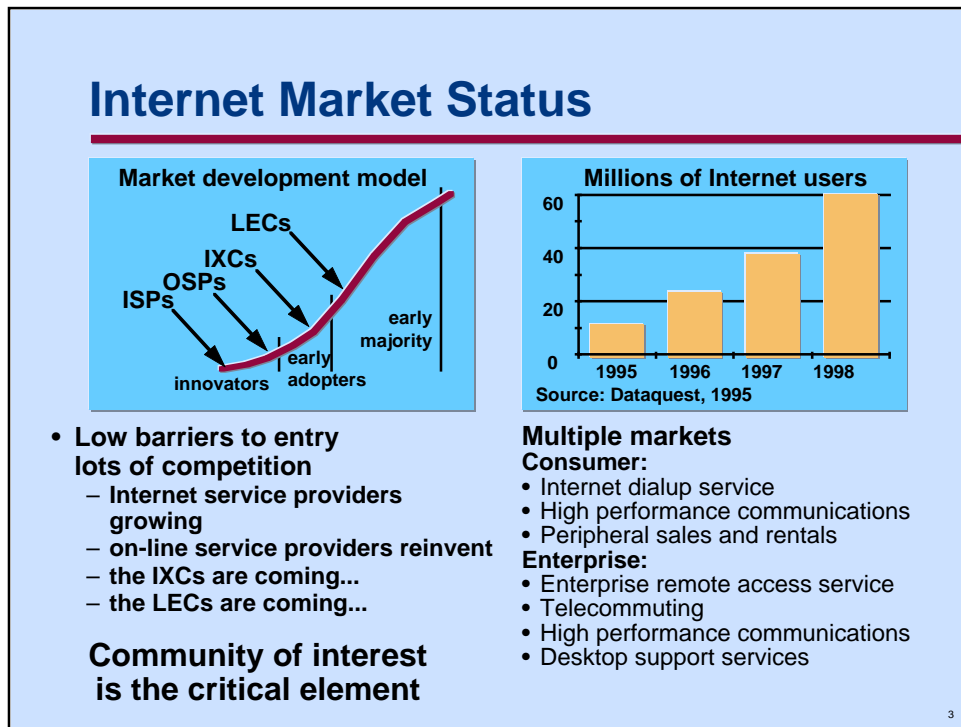
Agenda

- **Market trends**

- **New product category**

- **Nortel Internet solutions portfolio**

- **Backup charts**
  - business case dynamics
  - detailed product category comparison

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The Internet marketplace is large, fast-growing and competitive.

The intersection of the Internet and the public telephone network creates market discontinuities that drive new product categories. The Dialup Switch is one of these categories.

Nortel Rapport is a solution set for addressing the need for higher performance, more reliable and more secure access.

Internet Market Status

Market development model

LECs
IXCs
OSPs
ISPs

innovators early adopters

early majority

Millions of Internet users

60
40
20
0

1995 1996 1997 1998
Source: Dataquest, 1995

• **Low barriers to entry
   lots of competition**
   – **Internet service providers
      growing**
   – **on-line service providers reinvent**
   – **the IXCs are coming...**
   – **the LECs are coming...**

**Community of interest
is the critical element**

Multiple markets
Consumer:
• Internet dialup service
• High performance communications
• Peripheral sales and rentals
Enterprise:
• Enterprise remote access service
• Telecommuting
• High performance communications
• Desktop support services

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The Internet access market is large, fast-growing and exhibiting very low barriers to entry. It is attracting an avalanche of competition.

The big players with quality brand names will automatically extract large market share—consumers and businesses are already customers of the phone company—but the question is—*can they do so profitably?*

From a positioning perspective, consumers understand that the value of Internet access is not Internet access, but how the Internet is **bringing people together**—hence our Rapport brand name. As well, the market for Internet service is not uniform, nor homogeneous. In fact, the market is filled with a wide assortment of segments and markets and niches just waiting to be filled.

What we believe, however, is the key to success, is the definition and delivery of service to a sufficiently large, but specific community-of-interest.
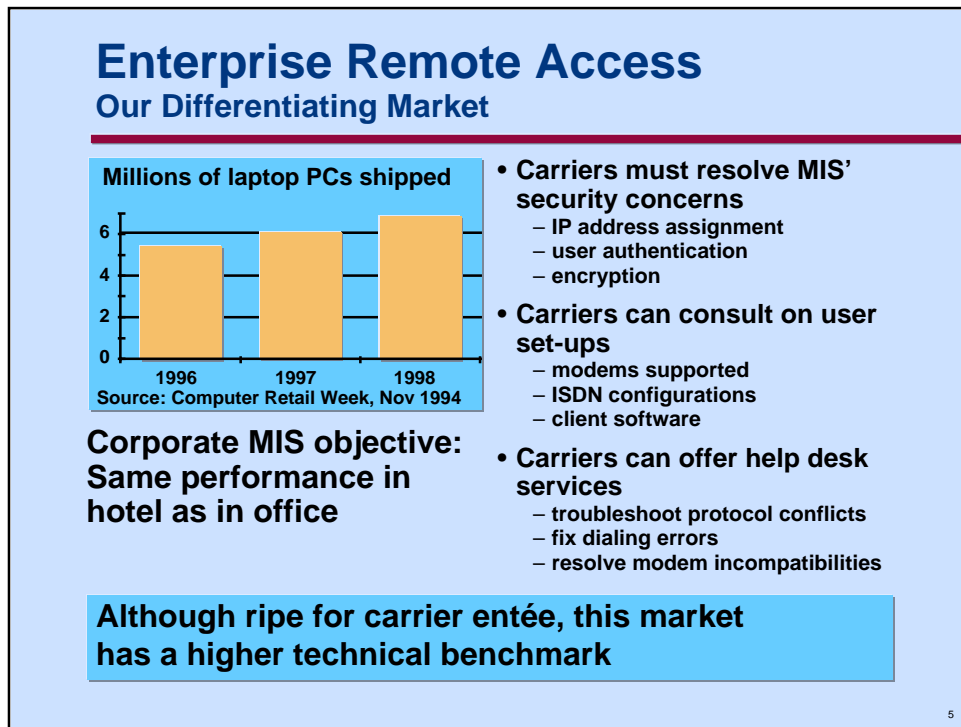
Nortel and the Internet

- **Competencies in internetworking:**
  - class A address (47)
  - operating one of the largest global enterprise internetworks growing since 1988
  - presence on the Internet since 1986
  - a board member of ANS, 1993-1995
  - contributed to several Internet Engineering Task Force standards
  - wholesaler of Internet services to independent operating companies
  - www.nortel.com is consistently rated as a top site
    - interactive age
    - disclosure magazine

- **Portfolio of Internet solutions: Rapport**

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Nortel understands the Internet and its role in accelerating business, simplifying infrastructure and enabling collaboration. Our competencies in internetworking have culminated in our solutions portfolio, the first product of which is the Rapport Dialup Switch.

Enterprise Remote Access
Our Differentiating Market

Millions of laptop PCs shipped

[Bar chart showing: 1996 ≈ 5, 1997 ≈ 6, 1998 ≈ 7]

6
4
2
0

1996   1997   1998
Source: Computer Retail Week, Nov 1994

Corporate MIS objective:
Same performance in
hotel as in office

- **Carriers must resolve MIS'**
  security concerns
  - IP address assignment
  - user authentication
  - encryption
- **Carriers can consult on user**
  set-ups
  - modems supported
  - ISDN configurations
  - client software
- **Carriers can offer help desk**
  services
  - troubleshoot protocol conflicts
  - fix dialing errors
  - resolve modem incompatibilities

Although ripe for carrier entée, this market
has a higher technical benchmark

5

Although the technology is similar, this related market has more sophisticated needs than the Internet access market.

This market also offers more margin and less customer churn (consumers will switch service providers more quickly than enterprise users) for the profit-savvy service provider.

However, there are specific issues that must be addressed, as shown here.

This is the key to Nortel's strategy. Carriers need to address this market's needs with the same infrastructure investments that they would use to address the needs of dialup consumers. The enterprise remote access market has a higher technical benchmark than strictly Internet access.

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This section covers the Dialup Switch category of product and compares it to other potential solution sets.
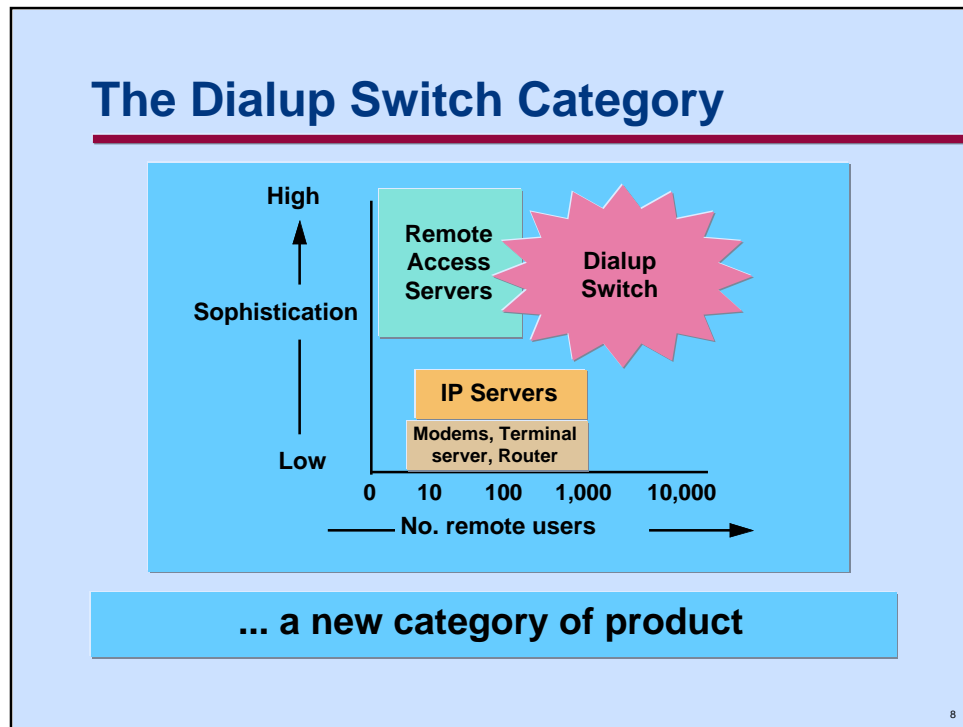
When Worlds Collide...

Attribute	PSTN	Internet or Corporate Internetwork
Objective	• Connect people	• Share computer resources
Technology	• Connection-oriented	• Connection-less
Design intent	• 1-to-1	• 1-to-1, 1-to-many, many-to-many
Delay tolerance	• Expect consistent	• No sensitivity
Max delay	• Max. 250 ms	• No sensitivity
Stress response	• Contention, blocking	• Delays introduced
Address space	• $<2/km^2$ of earth	• IPv6: $666 \times 10^{27}/km^2$ of earth
Bandwidth	• Narrowband	• Wideband +
Peak periods	• Mother's day	• Special events - Levy-Shoemaker 9
Players	• Oligopoly/monopoly	• Cast of thousands
Pricing	• Time and distance	– no distance sensitivity
Security	• Physical security	• Logical security

Unique networking paradigms collide to create new product categories

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This chart contrasts the public switched telephone network with the Internet. As these two, large and sophisticated networking environments collide, a market discontinuity forms at the intersection point which requires new kinds of products to address the needs of service providers and enterprises.

The Dialup Switch Category

High

Sophistication

Remote Access Servers

Dialup Switch

IP Servers

Modems, Terminal server, Router

Low

0   10   100   1,000   10,000

No. remote users

... a new category of product

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In contrast with other potential solution sets:

- Modems, terminal servers and router - low in sophistication (cables connecting each modem port to a terminal server port, for example) but relatively scalable;

- IP servers - similar scalability as the modems, terminal servers and routers implementation, yet nominally more sophisticated in that they support ISDN BRI users simultaneously, but they lack the required enterprise protocol and security services support;

- Remote access server (RAS) - Shiva's LanRover is high in sophistication (as demanded by enterprise remote access buyers) but suited to smaller numbers of remote users; and

- Dialup Switch - Nortel's Rapport Dialup Switch fits here—as sophisticated as the RAS, more scalable than IP servers or modems, terminal servers and routers.

The Dialup Switch category is a new category of product. Higher density, more scalable and higher performance. One way to look at the category comparison is with metaphors; as the workstation is to the personal computer, so the Dialup Switch is to the remote access server.
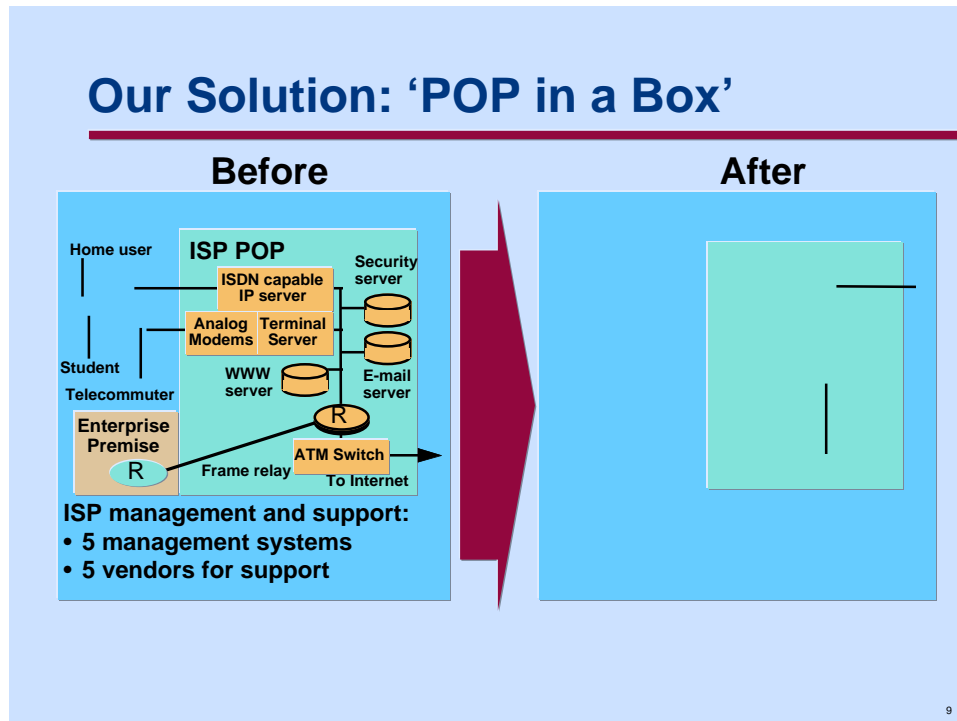
Before

1. ISDN BRI user traffic is aggregated by the central office switch into the IP server

2. Analog dial users are serviced through an analog modem bank which terminates on the...

3. terminal server for point-to-point protocol (PPP) or serial line IP (SLIP) termination and IP session management;

4. a distribution router connects remote enterprise dedicated connections and performs point-of-presence (POP) routing services; and

5. a frame relay or ATM switch integrates the POP into the Internet service providers (ISP) backbone network.

To round out the implementation are five management systems, five support contracts, five maintenance manuals and five training courses for employees.

After

The Dialup Switch category of product consolidates these five functions—modem pool, terminal server, IP server, distribution router and frame relay or ATM switch—lowers operating costs with one management system, one support contract, one training course and delivers advanced service provider features for accounting, user authentication and revenue-generating or cost-reducing applications.