Key Emerging Technology: VPNs

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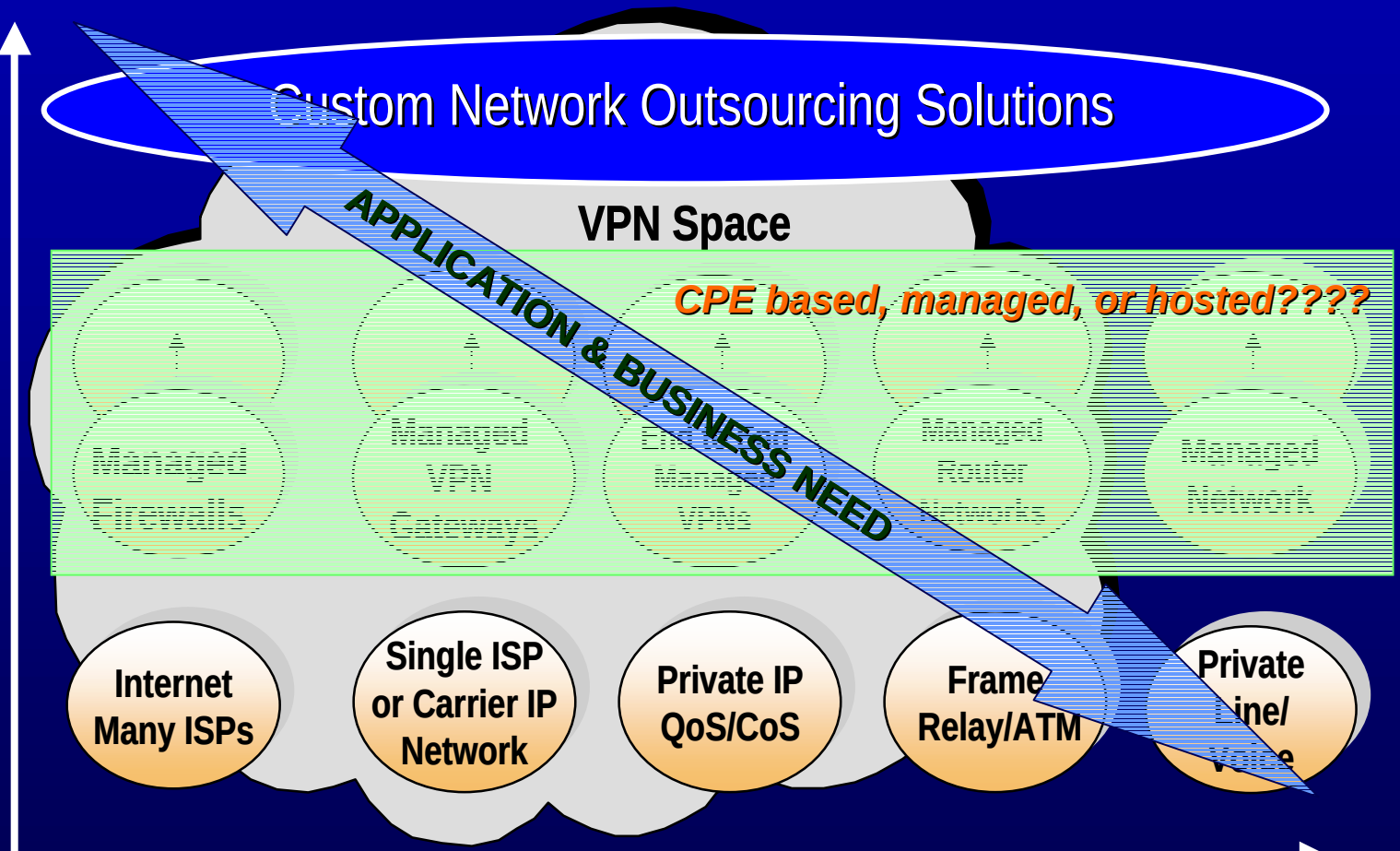
How did all this get started?



The world becomes a smaller place…..

The bottom line:
The distance barriers
are forever broken!

…using a seamless network

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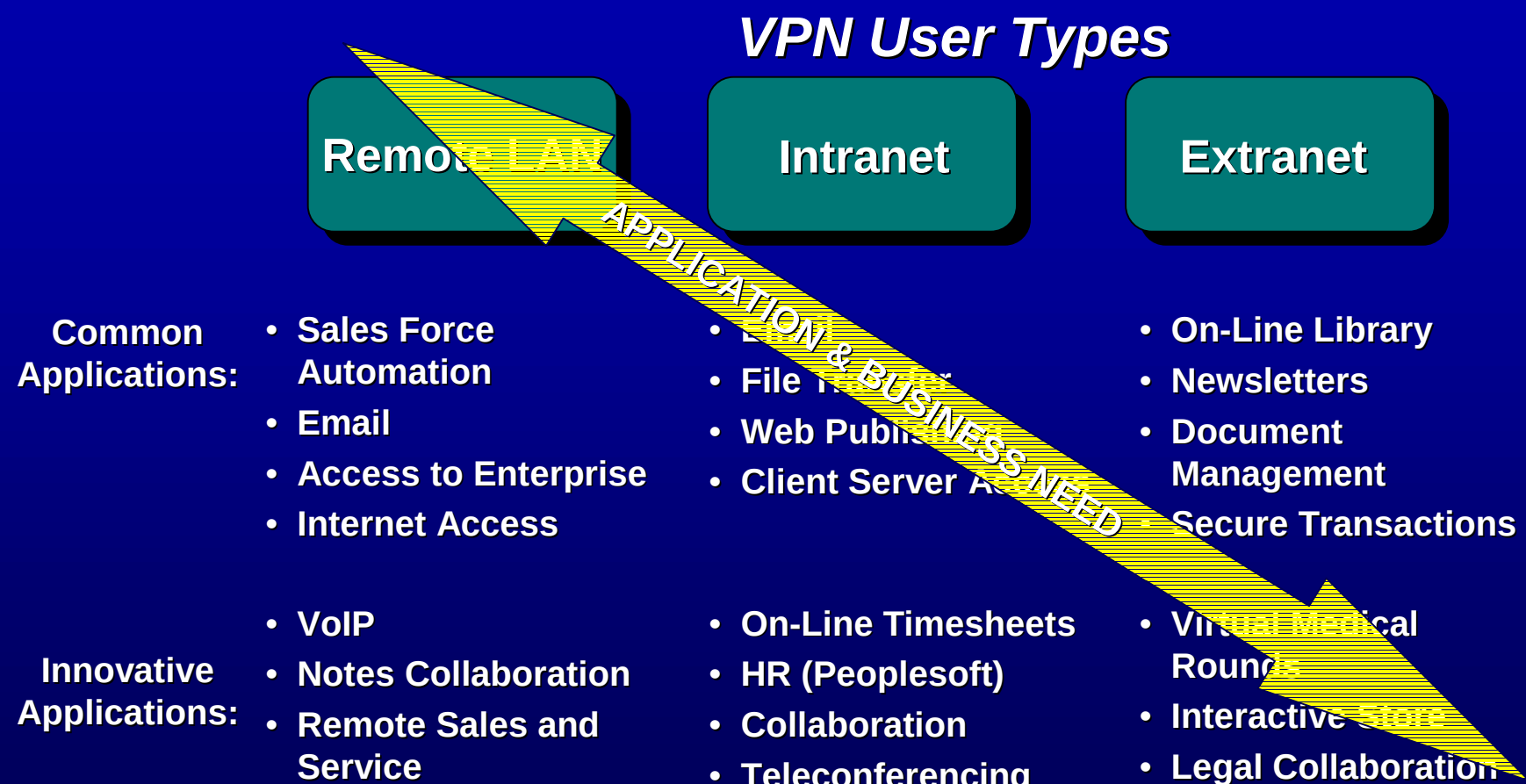
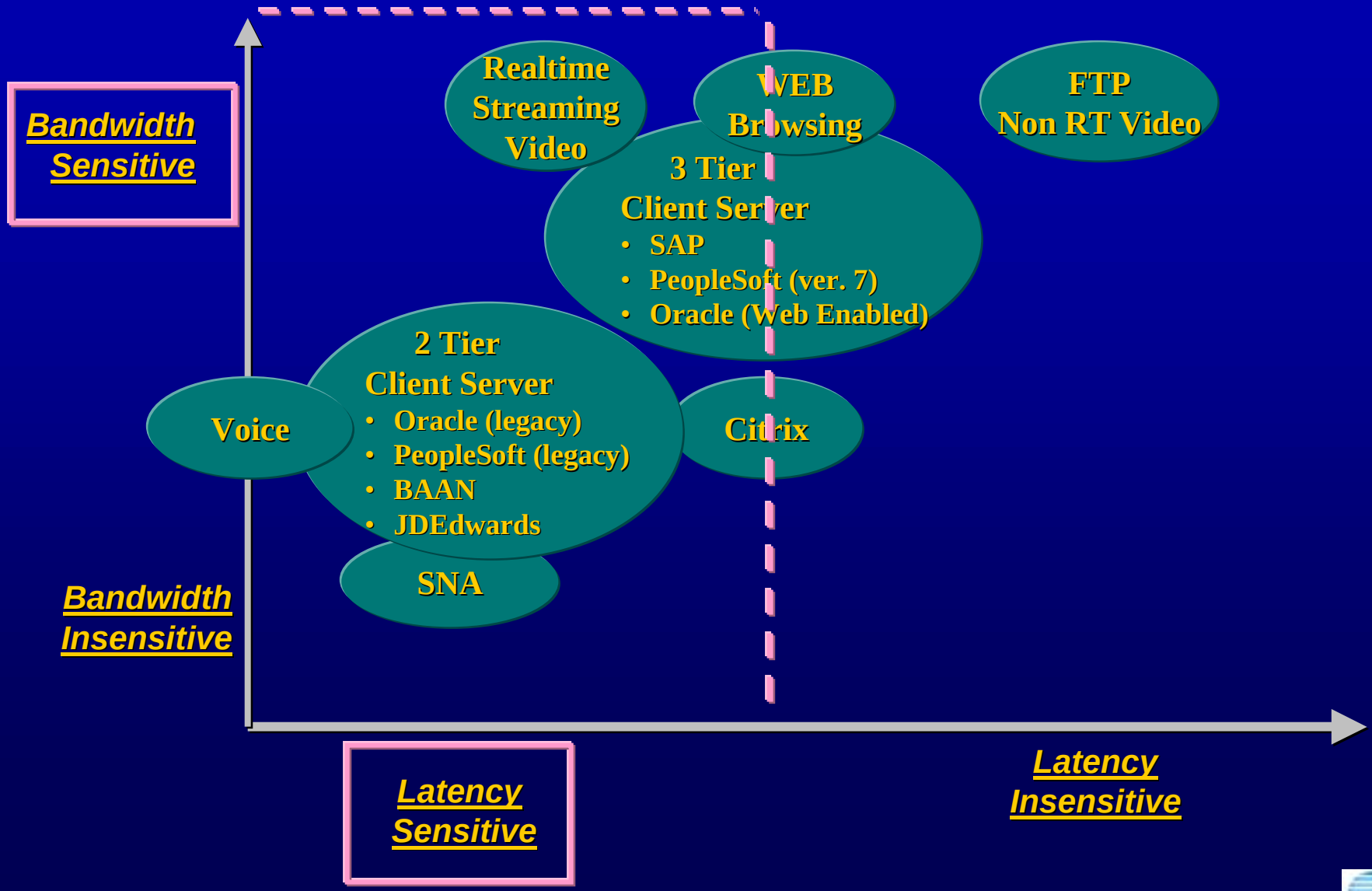
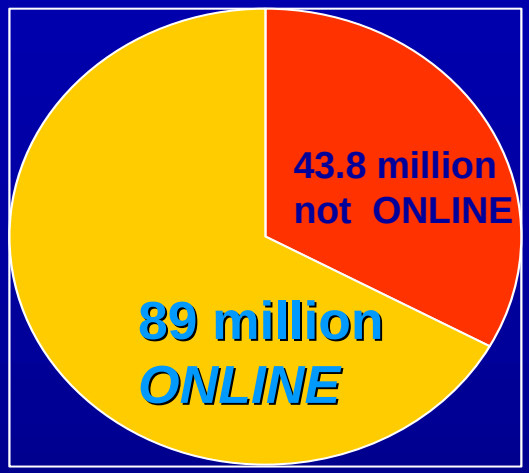
What VPN Users Do



VPN Application Requirements Vary

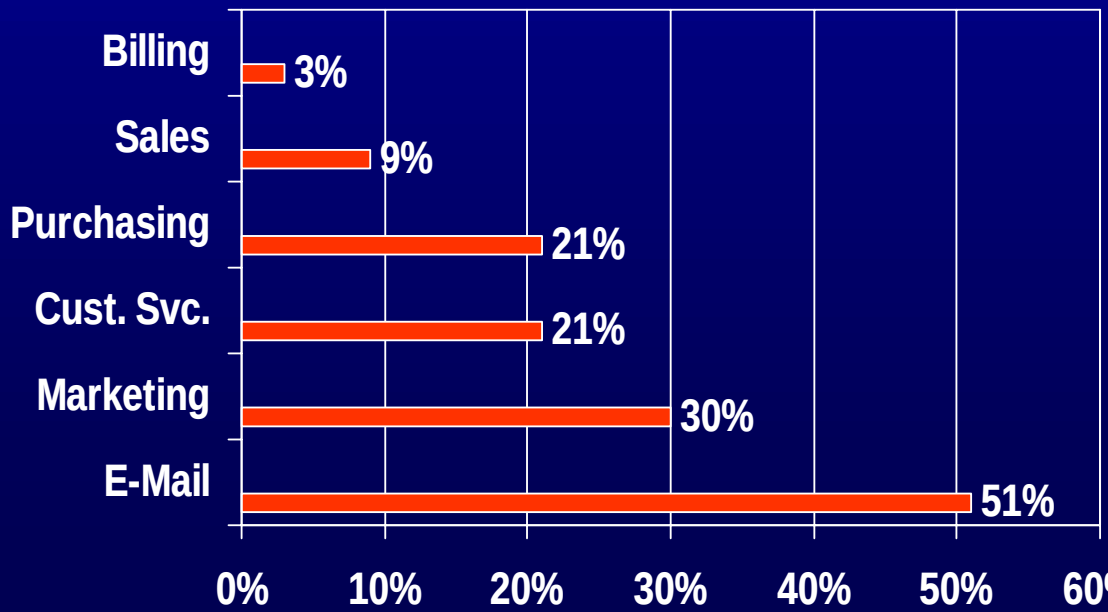


Number of US Employees online



Are there network growth numbers to support VPNs?

What are we doing on-line?



Source: Newsweek 5/01

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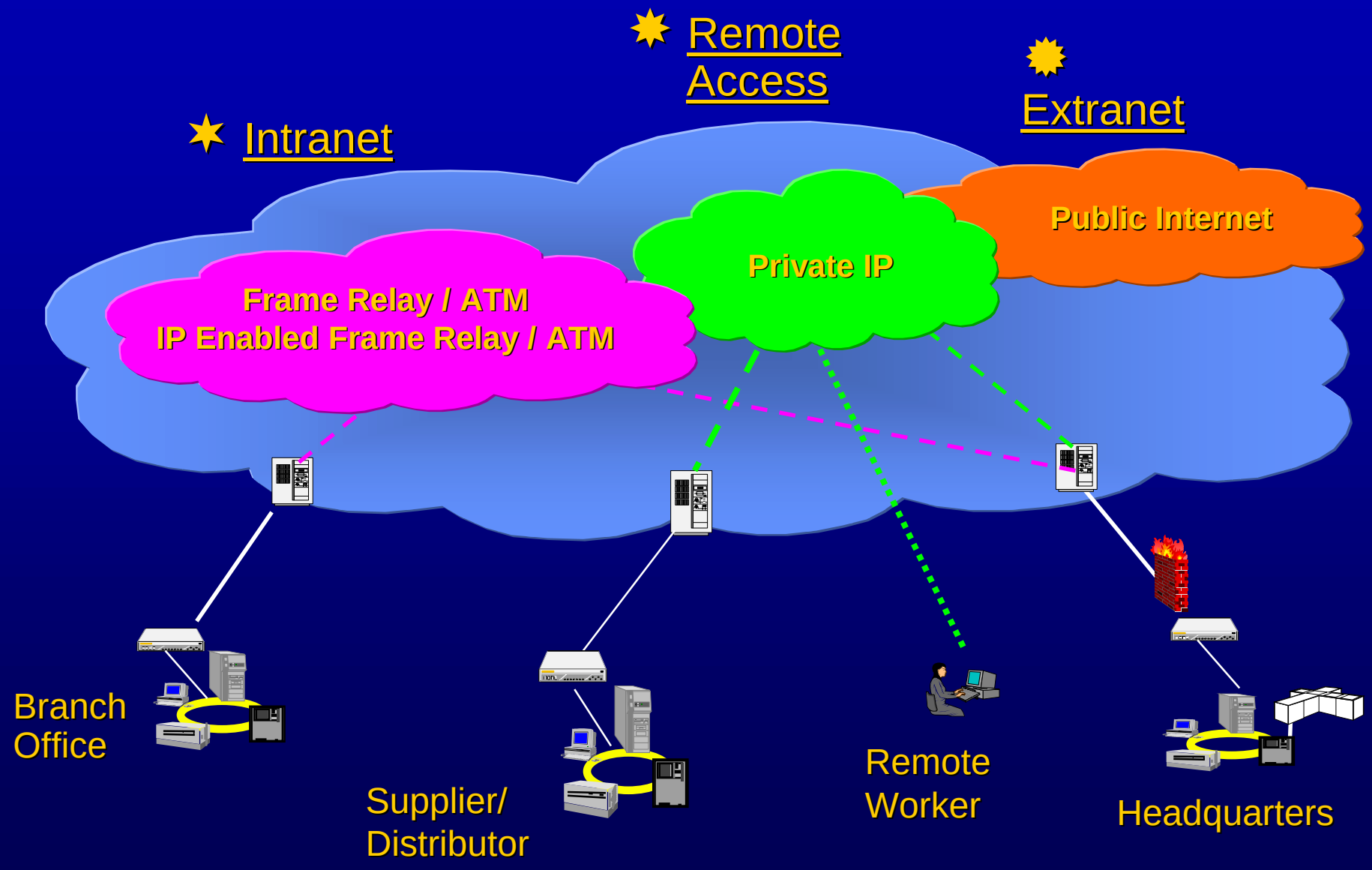
Why Are Customers Asking For VPNs Today?



Brought to you by the unifying language: IP

Elements of a VPN Solution

- ***Application and Policy***
- Access
- Bandwidth Management
- Security
- SLA's
- Globalization
- Implementation

VPN Implementation Options

- ***Provider-Based VPNs***
  - Intelligent, Policy-based Network Services
  - Oriented toward 'Enterprise Class' requirements
  - Currently Leverages Multi-Service Access Methods, becoming Access *Agnostic*
  - Seamless extensibility to IP-VPNs and Secure Internet Access
- ***Edge-Based VPNs***
  - CPE Based
  - Internet-Style (Best Effort) Packet Delivery
  - Leverages IP access Methods

Integrated VPNs:
Optimizing Implementations for Customers Enterprise Networks

- VPN "Services" are created by the bundling of various components such as transport, access, hosting, and security technologies ***to create Private Data Networking (PDN) functionality***
- ***Enterprise VPNs*** replicate the functionality of a PDN focusing on QoS, Security and SLAs
- ***Internet VPNs*** provide PDN functionality with the ***Best-effort characteristics of the Internet***
- The challenge for providers and customers alike is the increasing complexity of integration

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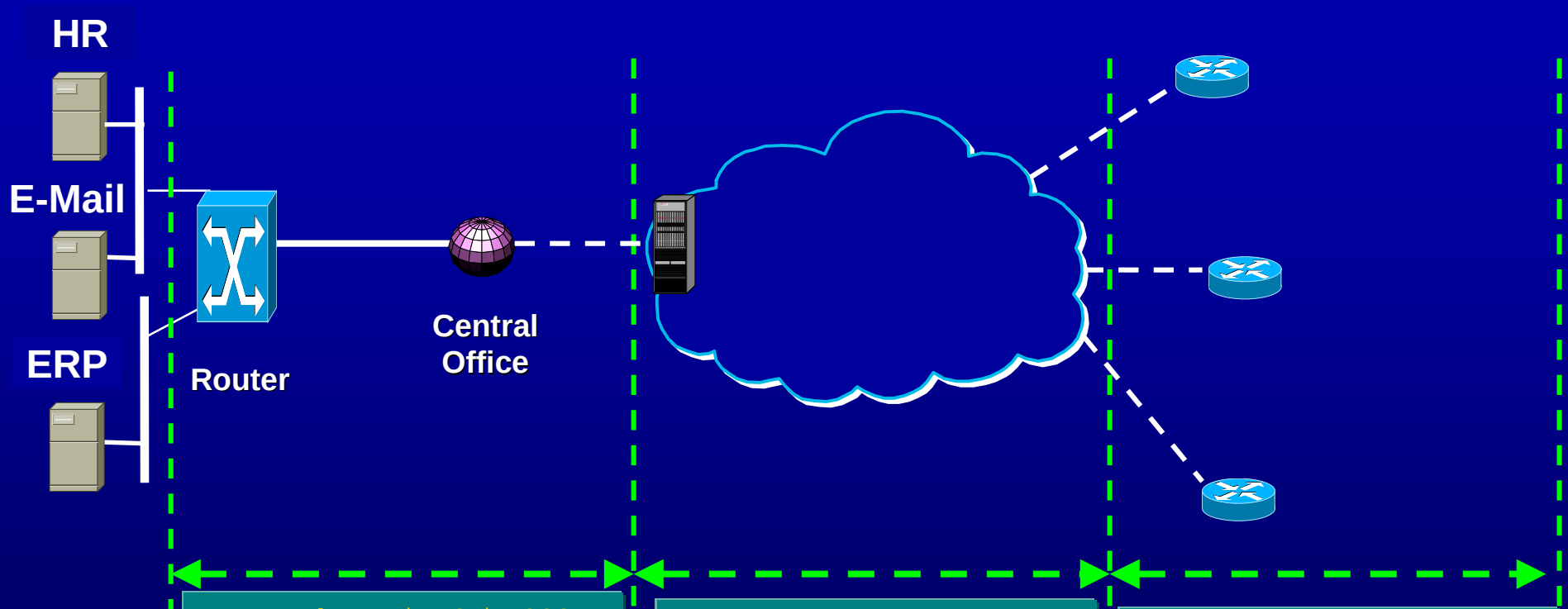
Building the network for the application and business need: Realities of what the customer is dealing with today!



Access loop: $150-$1,000.
Router: $500. To $60K
(add MRC for maint.)
Frame/ATM port: $200-$1K

- 60% to 90% of traffic is background.
- *Traffic load growing at 30% to 50% per annum*
- Network based intelligence is limited.

- Avg. 56K
- Tandem routed to corp. for most apps.
- Growing need for Internet access
- Meshing handled at corp. interface

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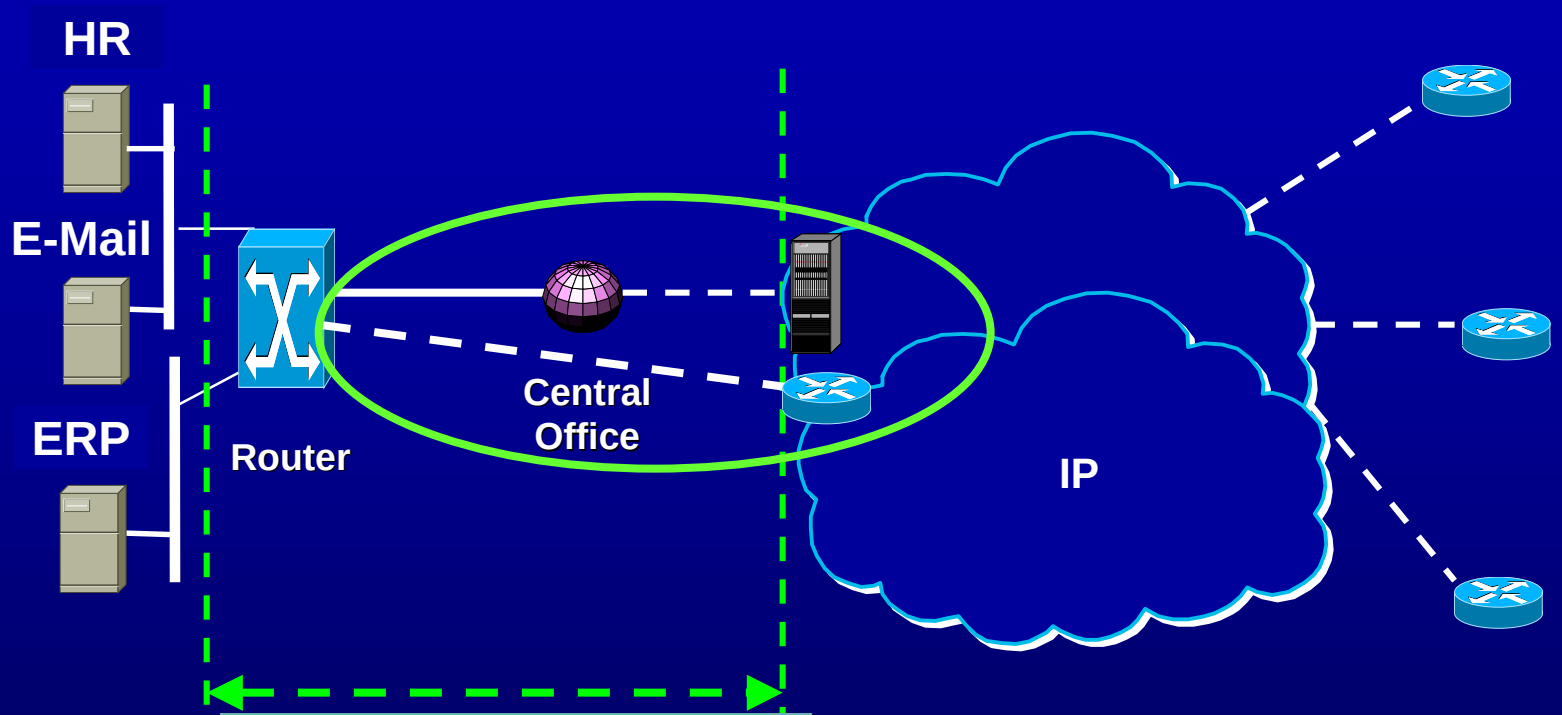
Building the network for the application and business need:

What we do and don't know…..

The Network gets logical...



- Access to the network can be both physical and logical.

Decisions on enterprise networking components….

If I have an existing Frame Relay or ATM network I can:

- Add lower cost connectivity through local FR, ATM, or PL
- Provided simplified any to any connectivity through IPFR or IPATM
- Add IP connectivity to facilitate secure internet traffic

If I am building a new VPN I can:

- Decide on core structure- IP or traditional services (ATM, FR, etc.)
- If the network is IP:
  - Private IP or Internet solution
  - Client and/or network based security required
  - Managed, out-tasked, or out-sourced solution

Most important: What is the business need and the application requirement?

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Private IP VPNs
Features, security, and simplicity.

	Frame Relay	Internet-Based VPN	Private IP VPN
Any-to-Any Connectivity	Expensive, Difficult	Yes	Yes
QoS and CoS	Yes	No	Yes
Reliability	High	Med	High
Simple Routing	No	Yes	Yes
Disaster Recovery	Manual	Automatic	Automatic
Private IP Addresses	Yes	Tunneled	Yes
Latency/Throughput	Low/High	Variable	Low/High
Secure	Yes	Edge	Yes
Administrative/ Engineering Costs	Low	High	Low

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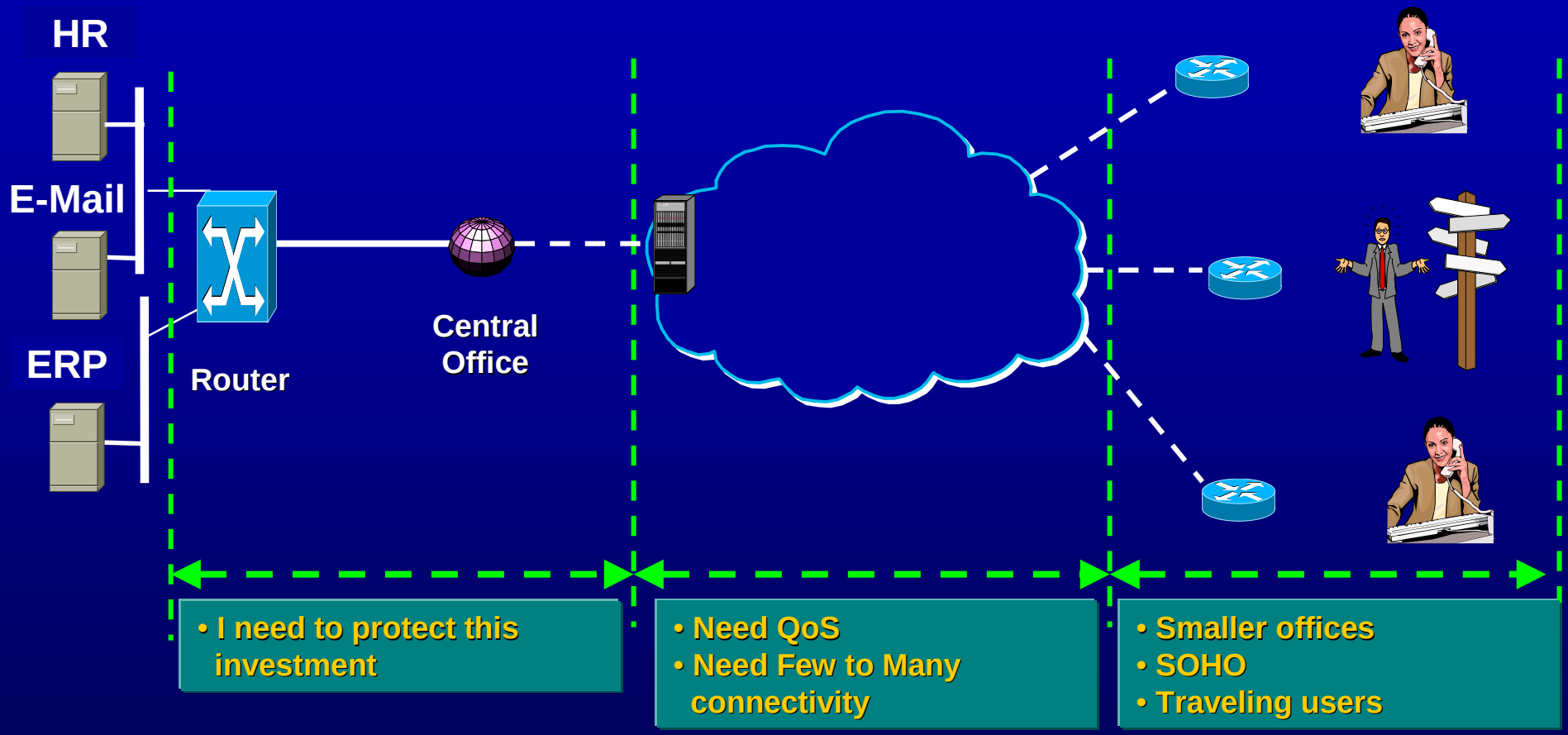
Building the network for the application and business need:
Investments to protect and new users with fast pipes.



- I need to protect this investment
- Need QoS
- Need Few to Many connectivity
- Smaller offices
- SOHO
- Traveling users

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A Baseline question for the network evolution

Is the business driver today just to move to IP VPNs……
….or to lower the overall cost of networking?

	128K FRoxDSL	144/144 IP xDSL
Transport (List Rate)	$170.00	$179.95
Average Discount	5%	25%
Transport (Net Rate)	$161.50	$134.96
CPE	Included	Inc. in Mgmt fee
Mgmt	Break/Fix	Inc. in Mgmt fee
Firewall	Included	$10.00
Tunneling	Included	$20.00
Sum Total	**$161.50**	**$164.96**

This is an illustrative example. Customer costs will vary.

It is essential to build networks to transport IP……
…..It is not essential that the core network transport is IP

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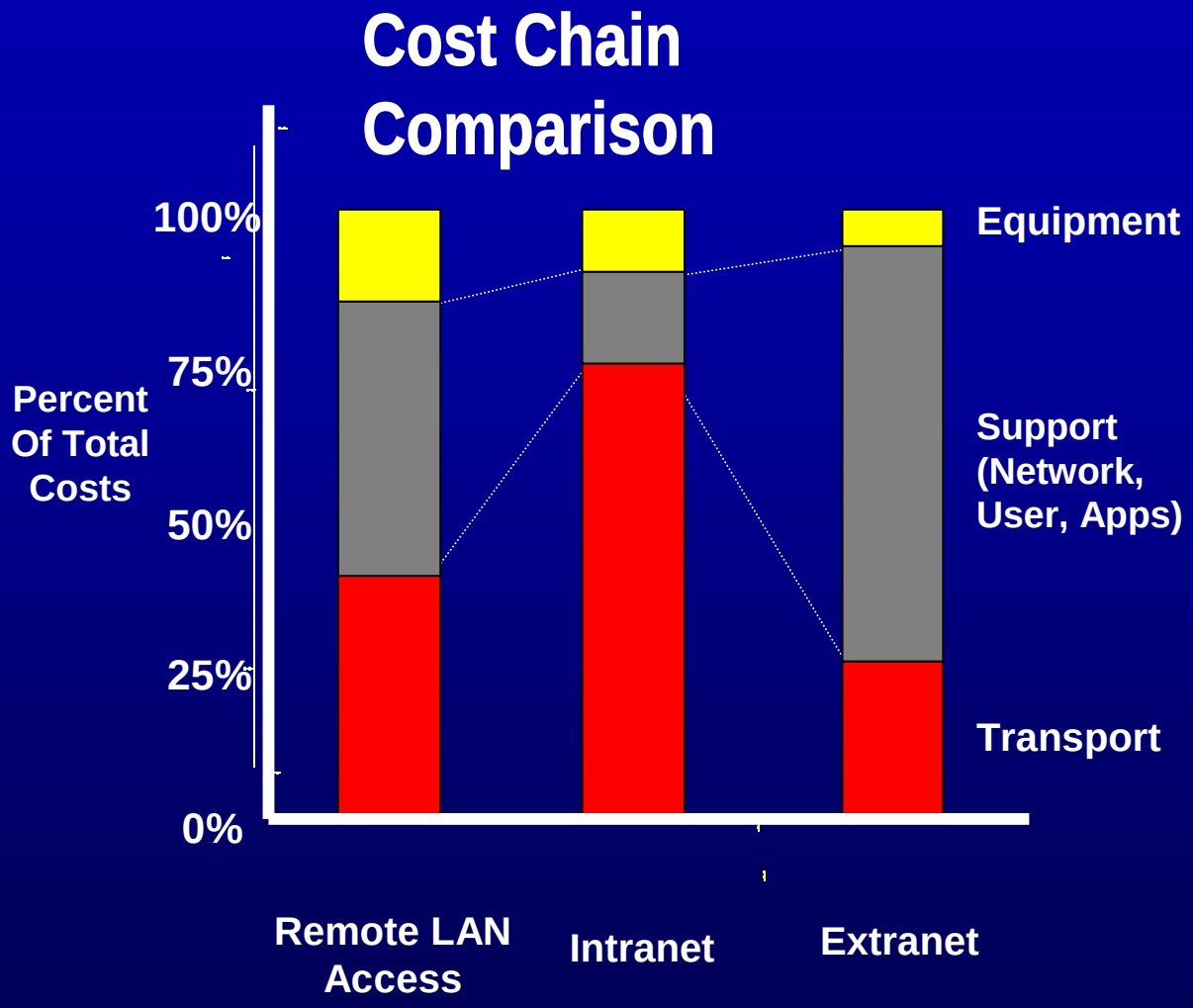
All VPNs are Not the Same



Today, the monthly rates for connections are usually about the same between frame relay and IP VPNs; for the latter, however, administration costs are typically five times higher than those of frame relay.

An enterprise with as few as 25 sites on an IP VPN network will require at least one full-time employee to manage the network. By comparison, managing a 25-site frame relay network would take only 20 percent of one employees time.

Gartner Group – Strategic Analysis Report
November 28, 2000

Layer 2 IP VPNs "The Best of Both Worlds?"

DSL to Frame Relay: Broadband access connectivity accesses your existing network infrastructure.
Result: VPN additions to your existing network if site to site VPN does not fit your application or business profile.

Dial to Frame Relay/ATM: dial connectivity accesses your existing network infrastructure.
Result: Dial VPN platform securely accesses your existing network.

IP Enabled Frame Relay: Single network connection allows for migration of the existing network infrastructure to a many to few VPN model.
Result: VPN connections via IPFR allow for simplified, lower cost VPN connections while maintaining the inherent security of layer 2 networking.

The bottom line:
Adding enhanced connectivity can be an invaluable step in the move to VPN connectivity!

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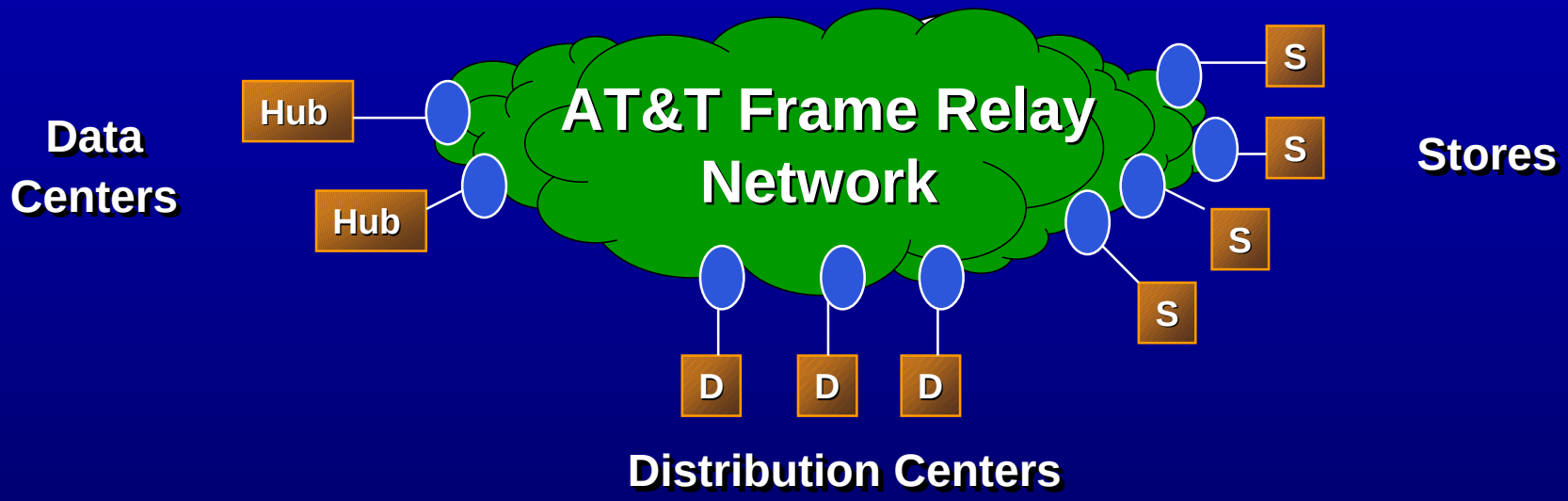
Major Retailer-Frame Relay

So I have this network today…now what?



- Hub and Spoke architecture
- Little to no distributed processing
- Bandwidth stabilized but background traffic creating contention
- Tandem routing at HQ location

Retailer - Network Evolution

Hosting Centers

Internet

Consumer
or
Remote Worker

NBFW

To B2B partners:
- UPS
- Fed Ex

IPFR VPN

AT&T Frame Relay Network

Hub

Hub

Data Centers

S

S

S

S

Stores

DataBase

In stock?

D

D

D

Distribution Centers

Consumer

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Thank you for your time!