GIS Application Delivery Challenges & Solutions During State of Emergencies

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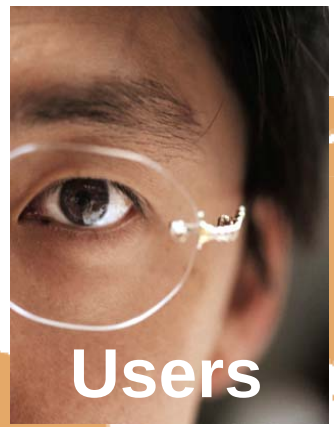
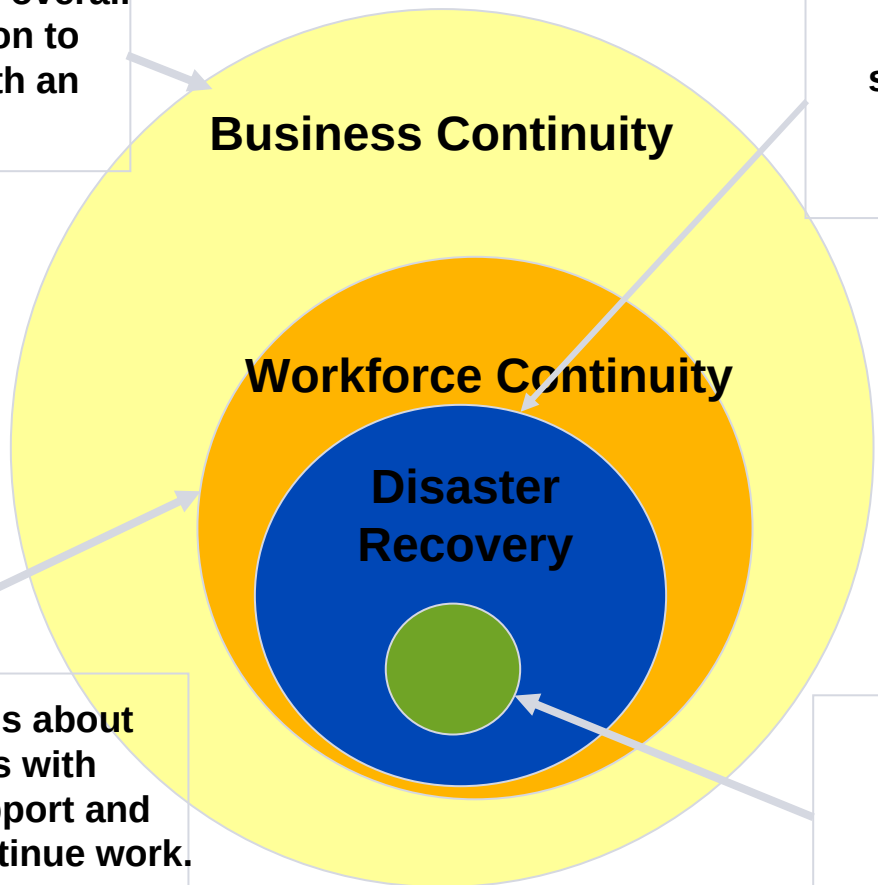
Business Continuity Challenge



When Disasters Hit … User are further away from their application and data

What is DR/BC?

Business Continuity is the overall ability of the organization to continue when faced with an unforeseen event



Disaster Recovery is a smaller piece of business continuity that generally focuses on technology

Workforce Continuity is about providing employees with application access, support and collaboration tools to continue work.

Fault Tolerance is used as one of the methods to help provide disaster recovery.

Business Continuity Preparation
Gaps

Power Outage

88% of enterprises prepared

Data Center Outage

70% of enterprises prepared

Workforce Disruption

13% of enterprises prepared

Only 13% of enterprises today are prepared for a major disruption in workforce operations

** *Gartner EXP*

** *Society for Information Management*

You Cannot Really Afford to Disrupt Operations - Even for 1 Day

- A major IT interruption
  - 70% out of business in 1 year
- 24 hours without access to data
  - 40% out of business
- 10 days' system downtime
  - 93% bankruptcy in 1 year
- 6th day of computer outage
  - 25% loss in daily revenue
- 1993 WTC bombing
  - Systems down, 150 folded

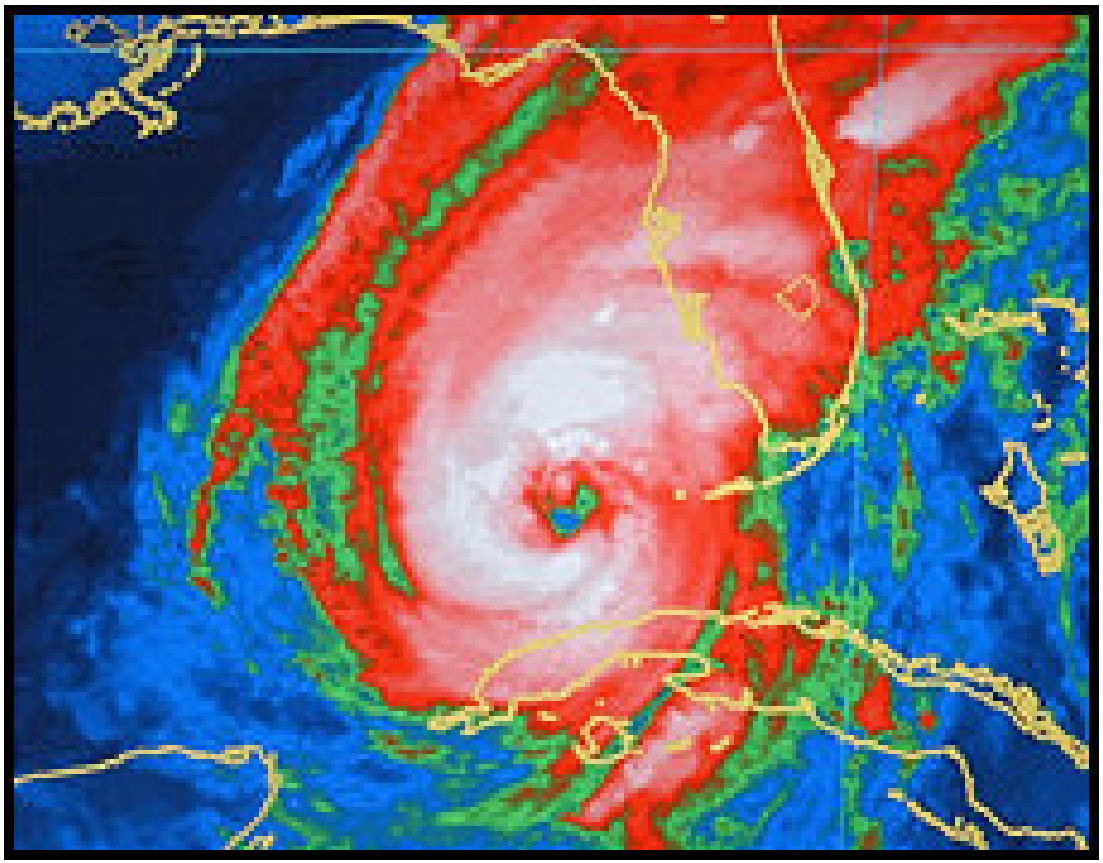
Gartner

Recommendations

- Work at home capabilities for an extended period of time
- Collaboration with co-workers
- Communication with customers and suppliers

Disasters affect Coastal States

Hurricane Wilma heading towards South Florida



David Personal Diary

Monday - October 24th

- 6:00 am – Check TV for Hurricane update
- 7:00 am – Winds up to 105 mph
- 8:30 am – Power goes out
- 9:00 am - land line phone and internet access goes out
- 10:00 am- Virtual workplace starts and I was able to conduct my weekly call.
- 11 am – 1 pm: With hurricane conditions, I was able to conduct one partner and one customer call.
- 1:30pm – Wind Subside – I go out to survey the damage.
- 1:31pm – clean up begins
- Power was not guaranteed for 5 – 20 days.

Kodak Moments (4 Hurricanes in one year)

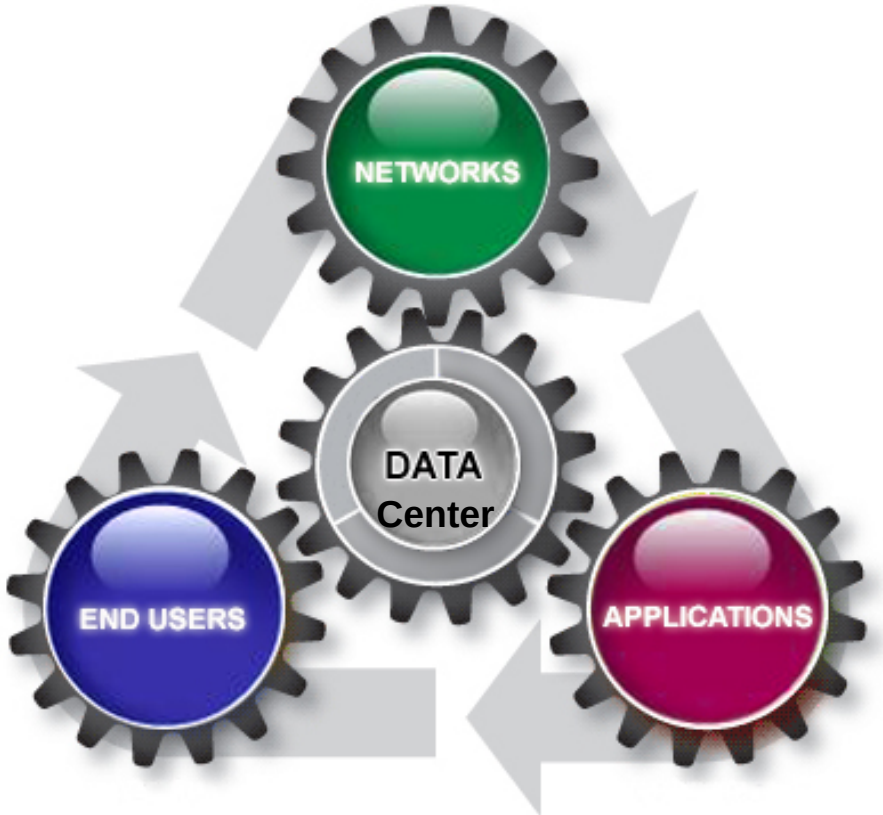
- Hurricane Wilma

Florida HQ

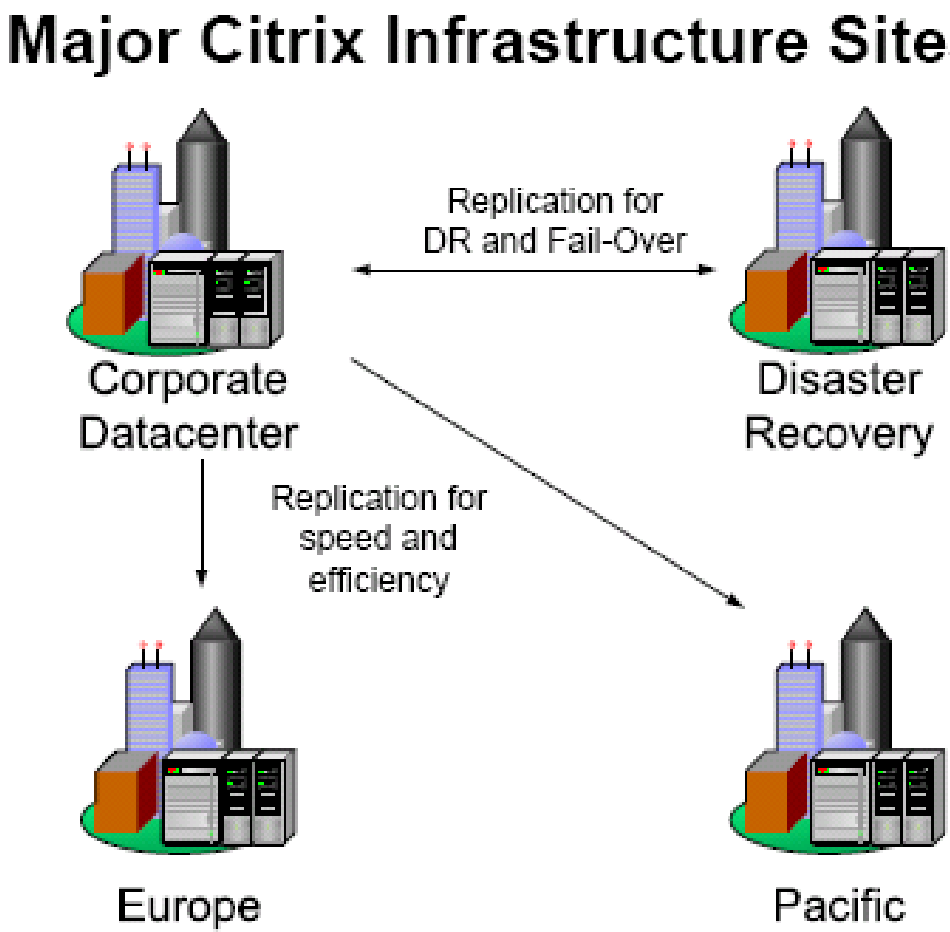
- Office HVAC system is blown away
- Power is down for 5 days
- Additional Generators and Fuel was redirected to mission critical area
- Critical Staff moved to Atlanta Satellite Office

IT Challenges

- **Data Center**
- Applications
- Networks
- End Users



Critical Operation Centers



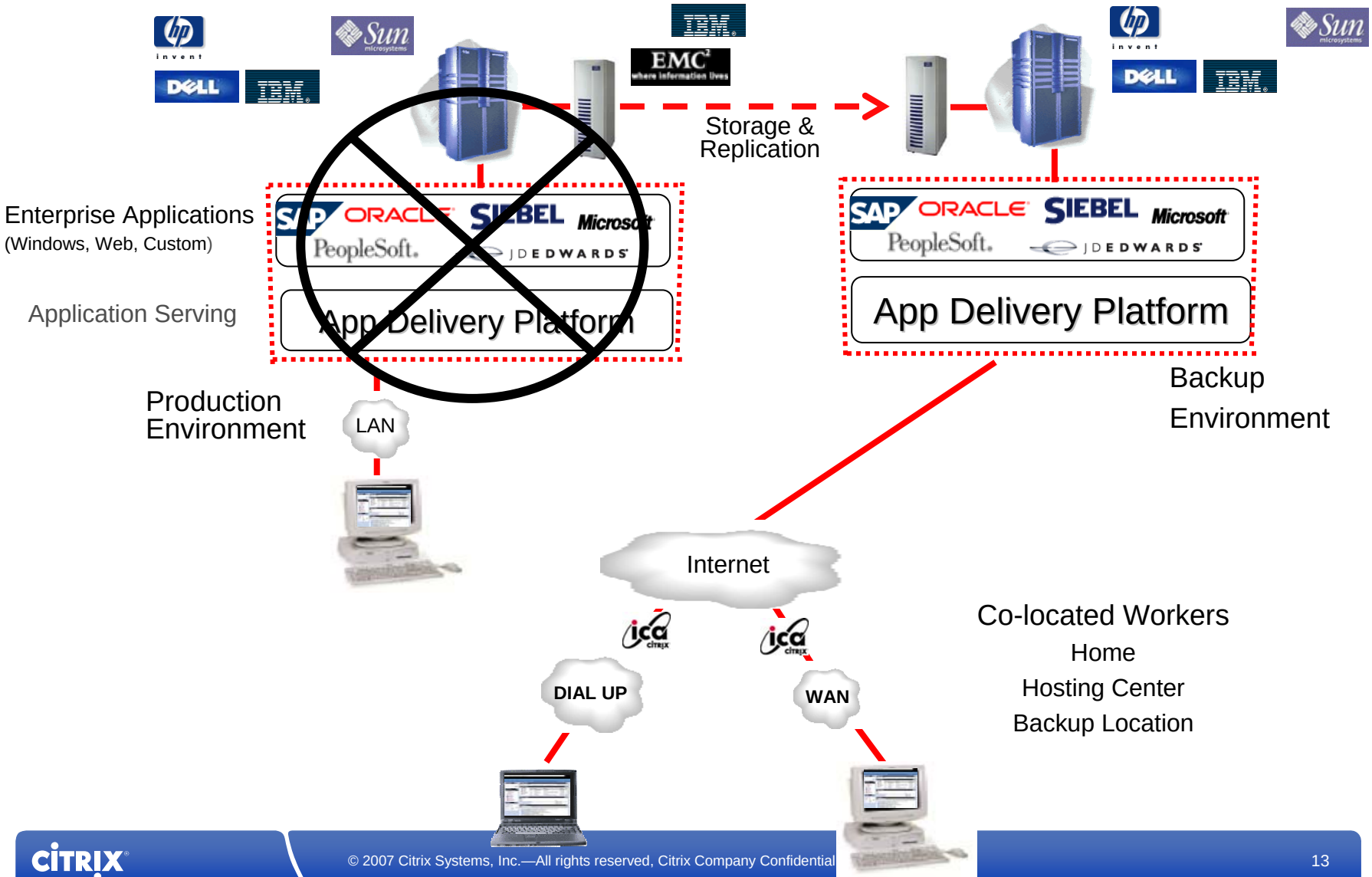
Hardened, carrier rich Corporate Datacenter

Fully online DR datacenter

Fail-over is automated where it makes sense and a single manual step when necessary

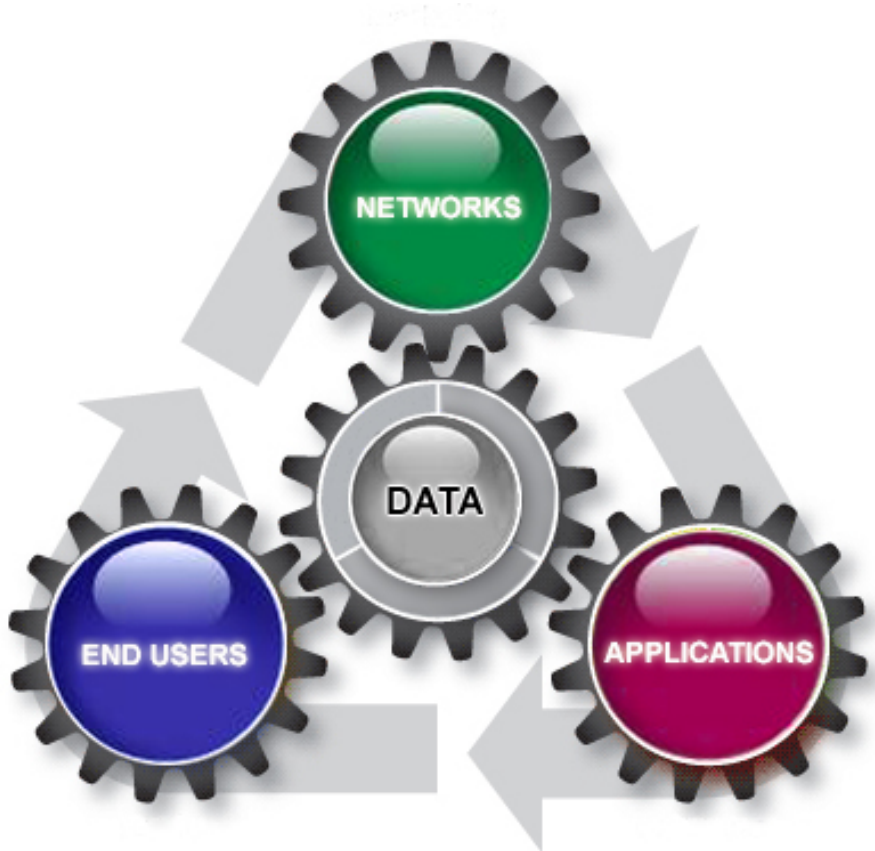
Users continue to do the exact same things when the systems are failed over.

Disaster Recovery Architecture

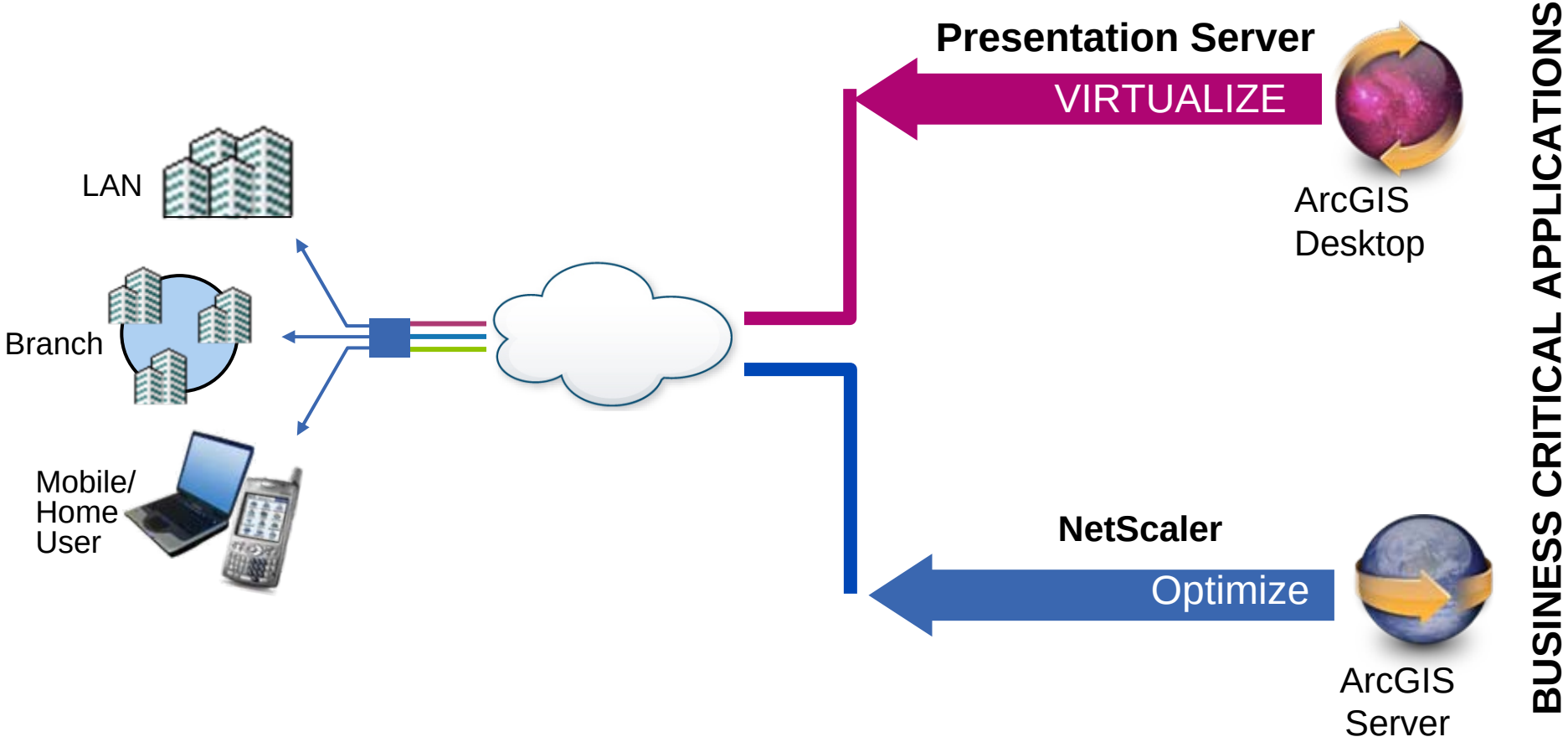


IT Challenges

- Data Center
- **Applications**
- **Networks**
- **End Users**



Deliver ESRI application through Citrix



Fastest **PERFORMANCE**

Best **SECURITY**

Lowest **COST**

Deliver ArcGIS Desktop

Citrix Presentation Server

(Win32, Win64, UNIX)

Centralized Back-ups

Easy Re-Routing of Employees

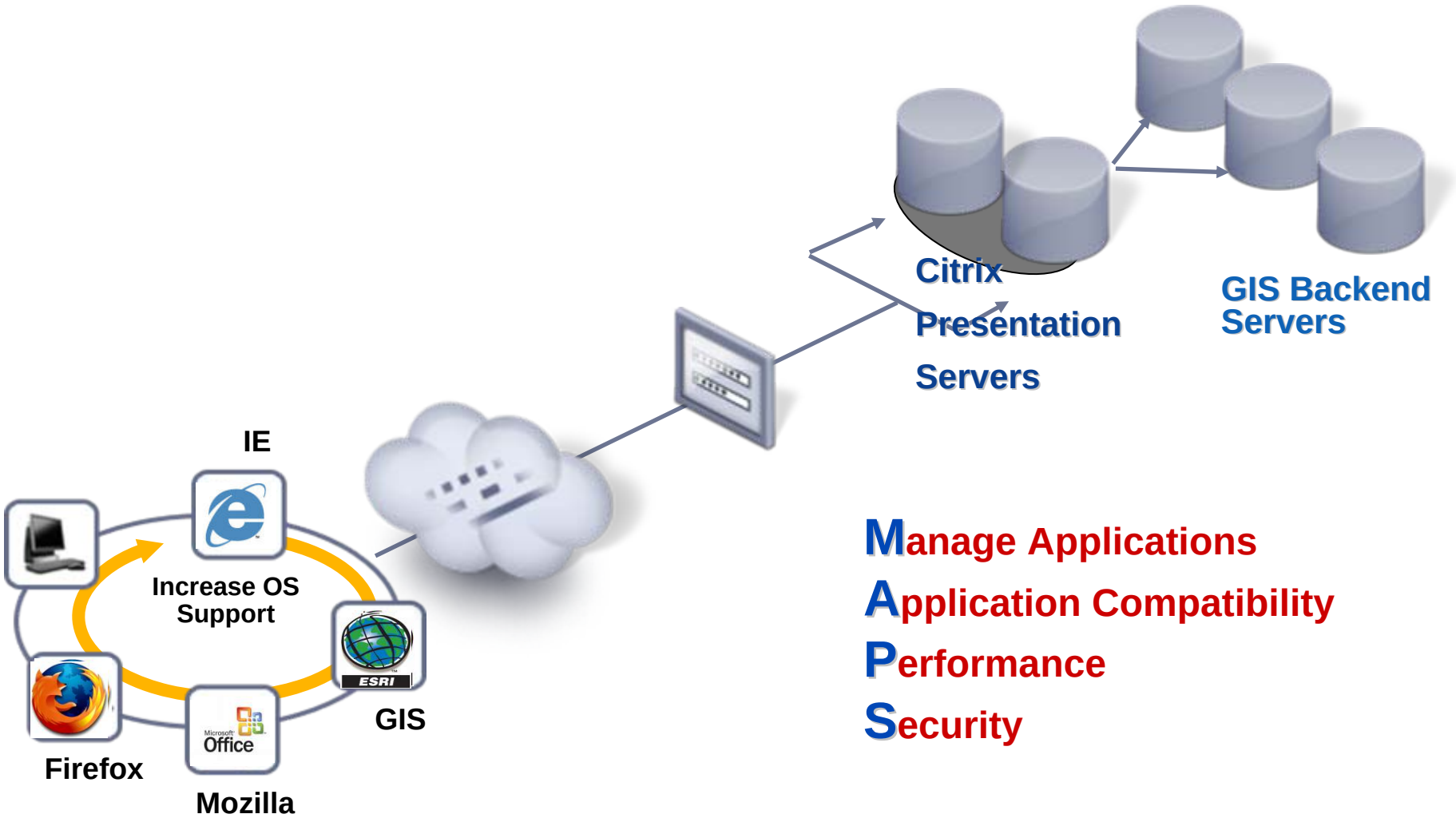
No User-Side Installs

Use Any Computer

Support Low Bandwidth

Browser Based Access

Centralize ArcGIS Desktop



Manage Applications
Application Compatibility
Performance
Security

Typical Hardware Requirements for ArcGIS Desktop

1 Users

- Intel® Pentium® 4, 2.2 GHz or greater
- 2 - 4 GB RAM
- 1.5 GB free disk space for installation
- 1024x768 VGA with True Color
- Microsoft Internet Explorer® 6.0 SP1 or higher

Hardware Needed =
 # Applications
X
Hardware Requirements

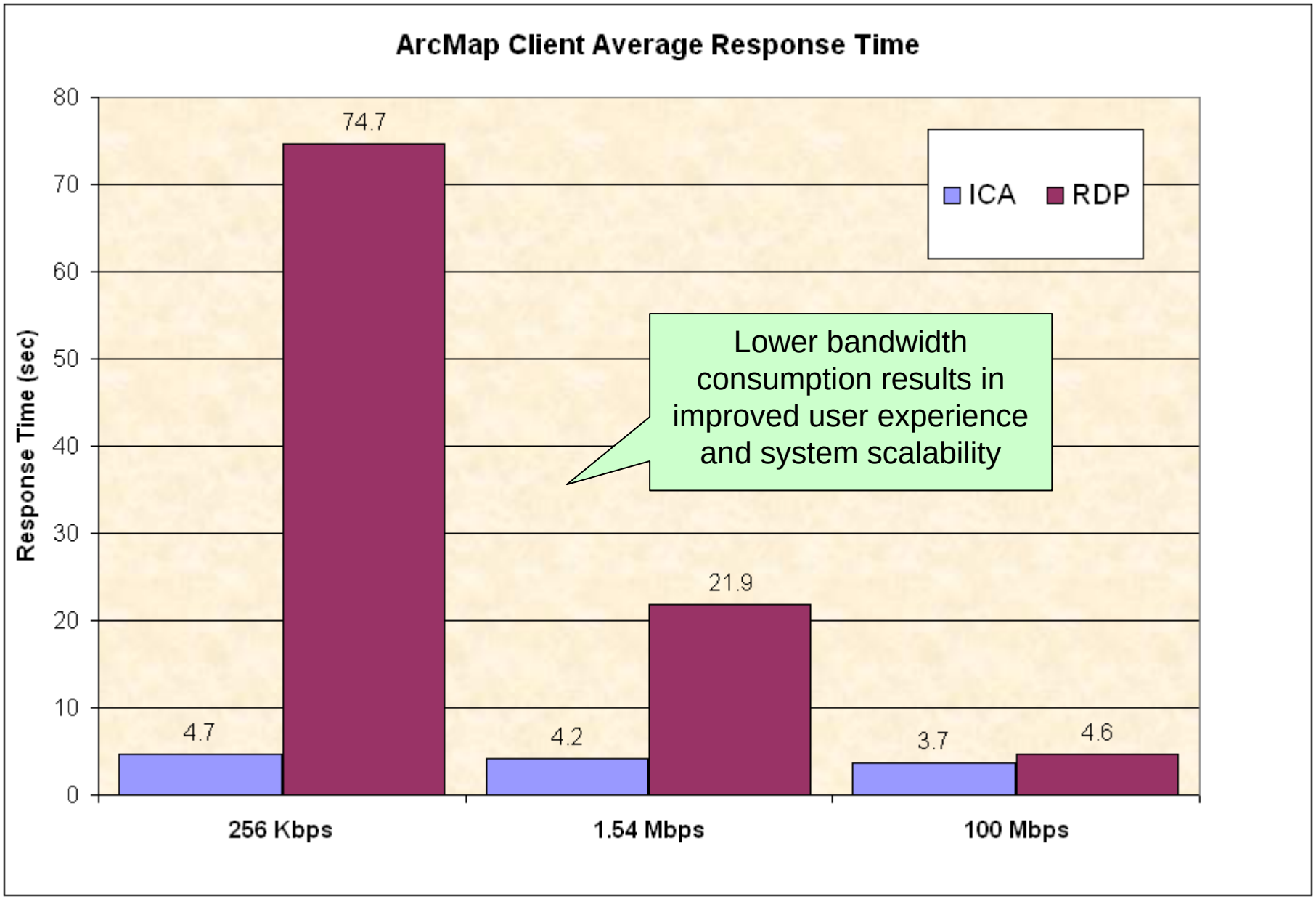
ArcGIS Desktop Client Side Requirements

Software Requirements	Windows 2000	Windows XP	Windows 2003	Windows 2000	Windows NT	Windows 95/98	Windows 16-bit
ESRI ArcGIS Desktop	X	X		X	X		
Citrix	X	X	X	X	X	X	X

	DOS	Linux	UNIX	Solaris	Mac OS	Blackberry	OS/2	EPOC/Symbian OS
ESRI ArcGIS Desktop								
Citrix	X	X	X	X	X	X	X	X

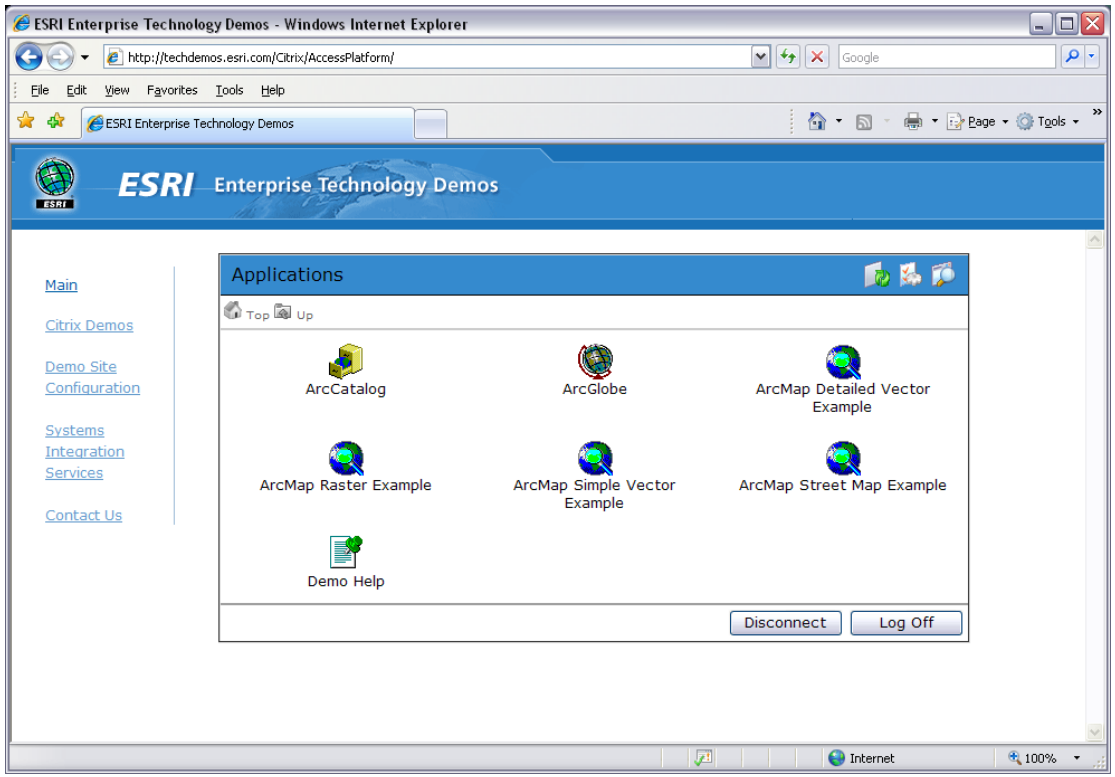
Presentation Server Provides Network Advantages for ESRI Applications

Bandwidth	File Servers	SDE Servers	Windows Terminals	Web Products
10 Mbps LAN	2-4	10-20	350-700	150-300
16 Mbps LAN	3-6	16-32	550-1100	250-500
100 Mbps LAN	20-40	100-200	3,500-7,000	1,500-3,000
1 Gbps LAN	200-400	1,000-2,000	35,000-70,000	15,000-30,000
Wide Area Networks		**Concurrent Client Loads**		
Bandwidth	**File Servers**	**SDE Servers**	**Windows Terminals**	**Web Products**
56 Kbps Modem	NR	NR	2-4	1-2
128 Kbps ISDN	NR	NR	5-10	2-4
256 Kbps DSL	NR	NR	10-20	5-10
512 Kbps	NR	NR	20-40	10-20
1.54 Mbps T-1	NR	1-2	50-100	25-50
2 Mbps E-1	NR	1-3	75-150	40-80
6.16 Mbps T-2	1-2	6-12	200-400	100-200
45 Mbps T-3	10-20	50-100	1,500-3,000	700-1500
155 Mbps ATM	30-60	150-300	5,000-10,000	2,500-5,000



ArcGIS Citrix Demo

- http://techdemos.esri.com



Deliver ArcGIS Server

Citrix NetScaler System

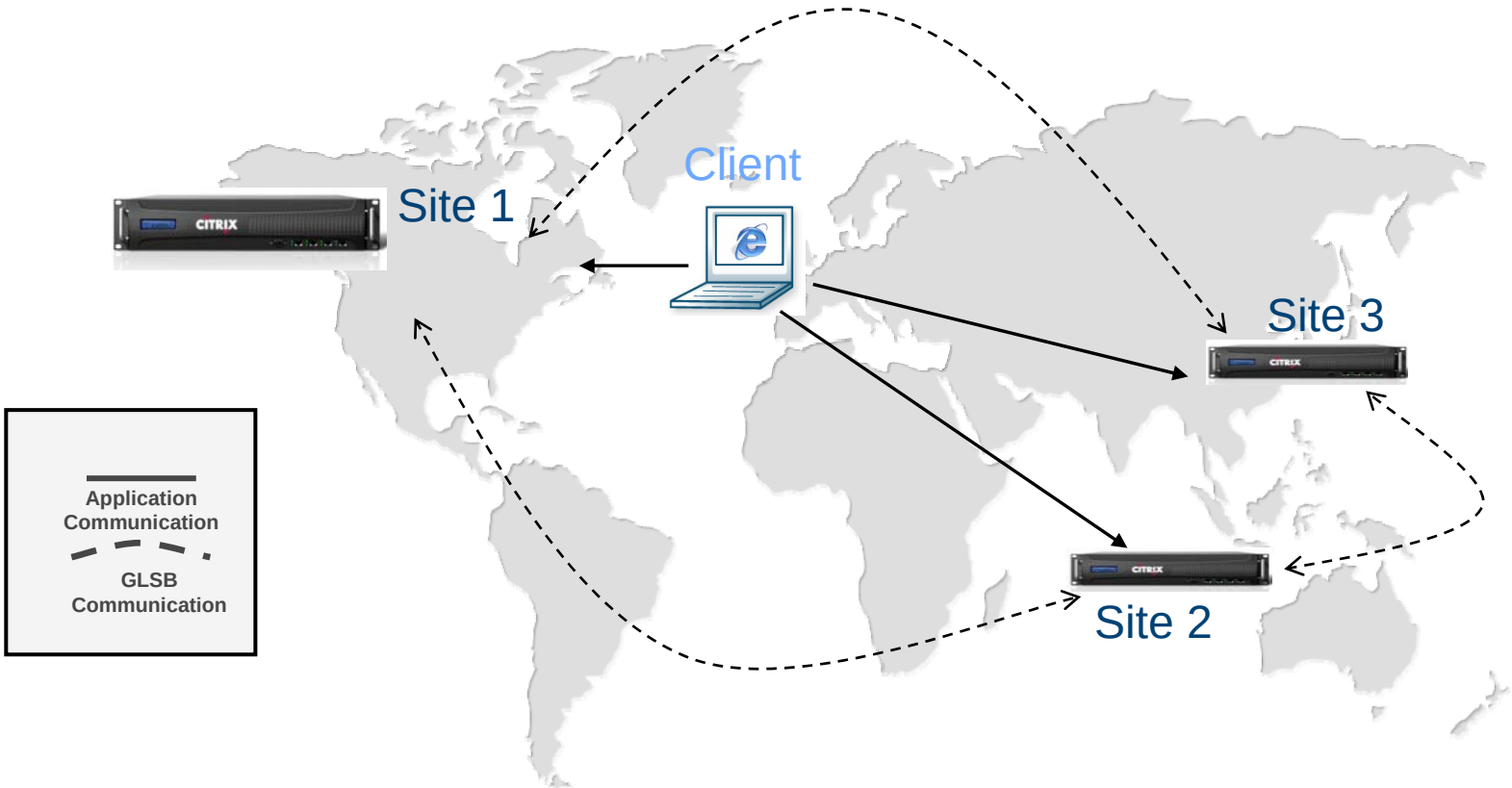
Hot Failover

Application Acceleration

Load Balancing

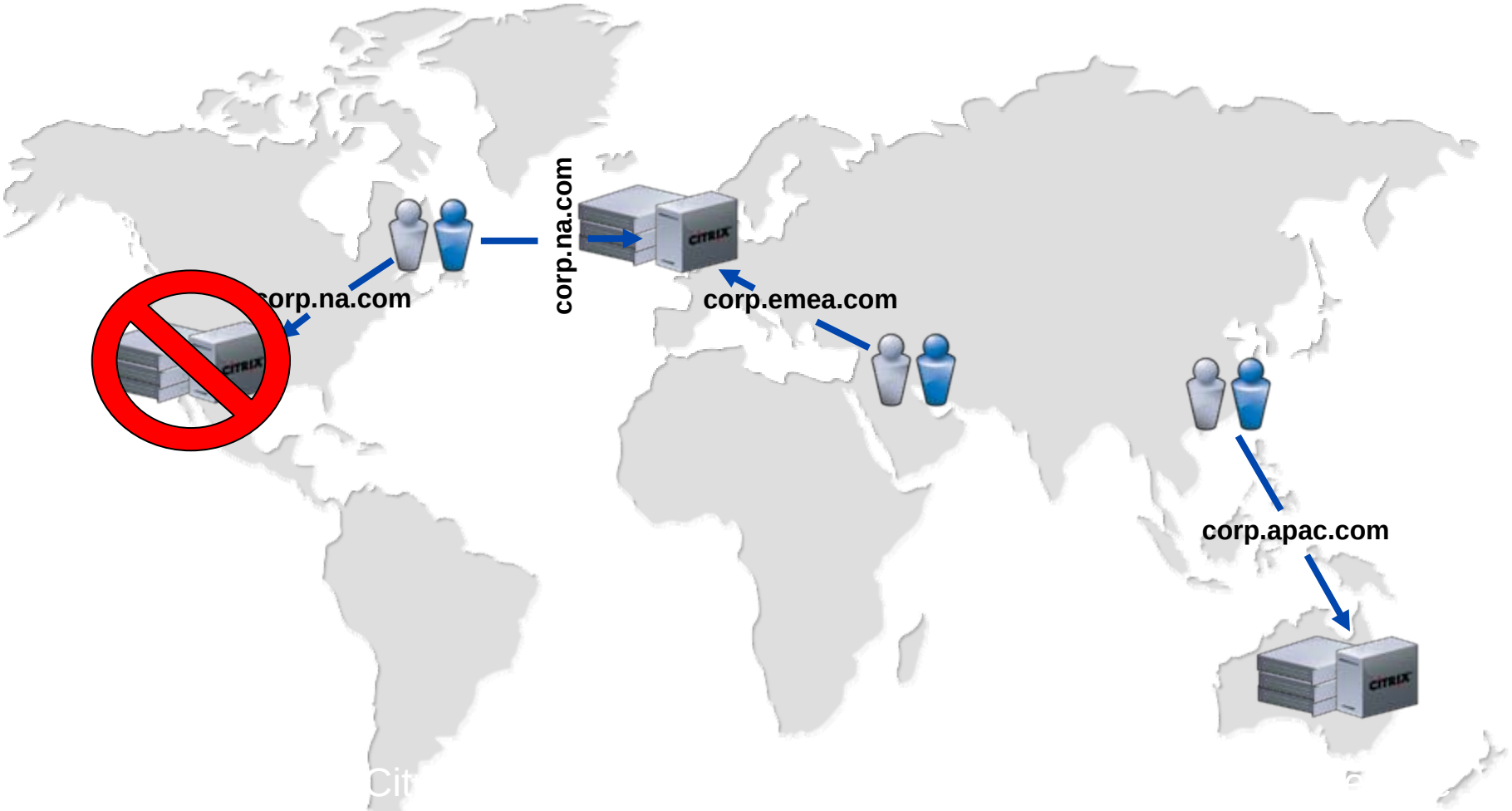
High Availability

Citrix Global Server Load Balancing



- ✓ Distributes traffic among multiple sites
  - ➢ Site selection reduces application latency
- ✓ Seamless disaster recovery access

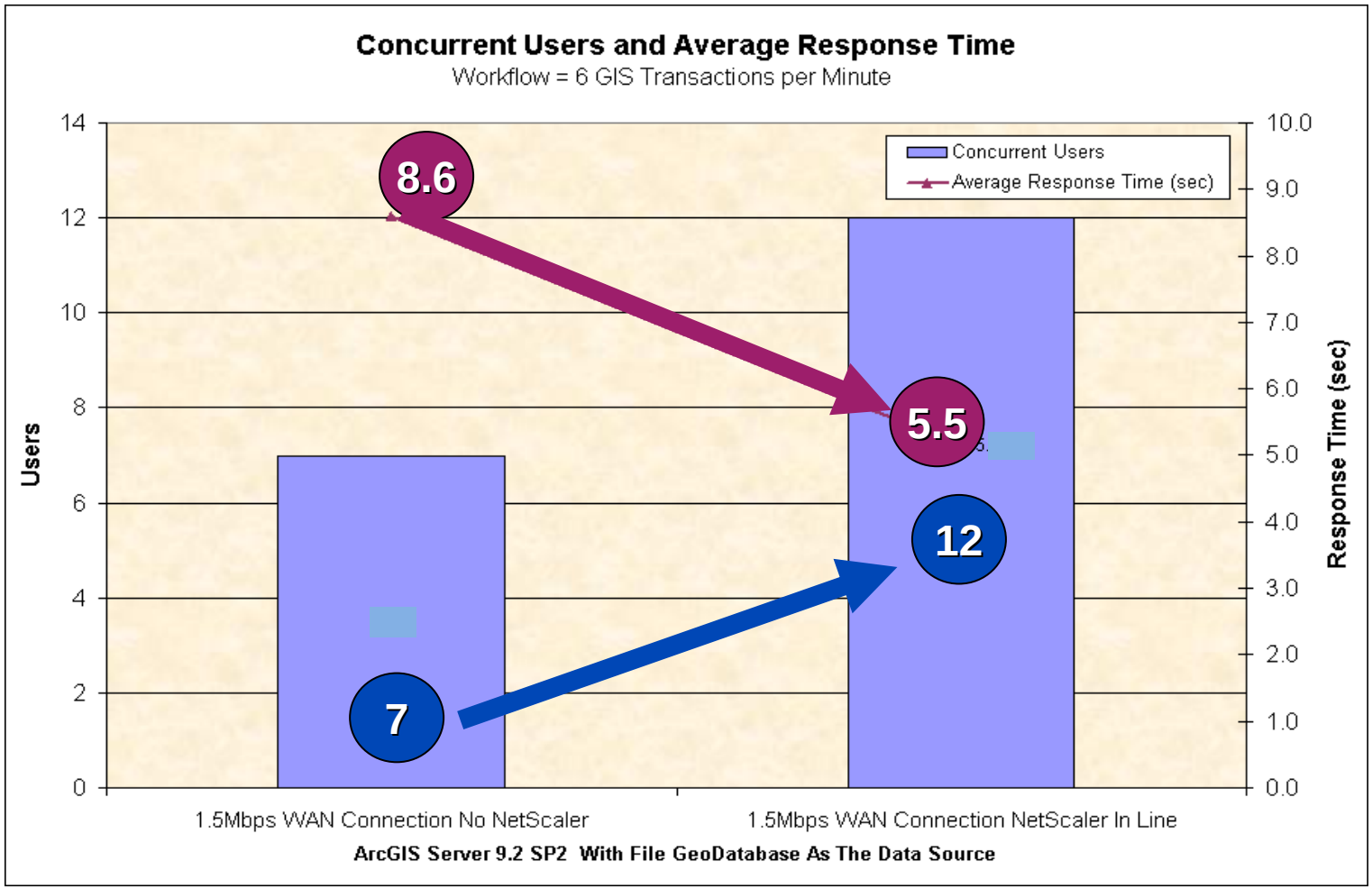
NetScaler Global Availability



Citrix Accelerates ArcGIS Server

Concurrent Users	5Mbps	1.5 Mbps	768 Kbps
With Out NetScaler	17 Users	7 Users	2 Users
With NetScaler	25 Users	12 Users	2 Users
Increase in Users from baseline	47%	71%	0%
Response Time	**5Mbps**	**1.5 Mbps**	**768 Kbps**
With Out NetScaler	4.6 Sec	8.6 Sec	6.11 Sec
With NetScaler	2.4 Sec	5.2 Sec	4.24 Sec
Decrease in Time from baseline	47%	39%	30%

NetScaler accelerates GIS applications



67%

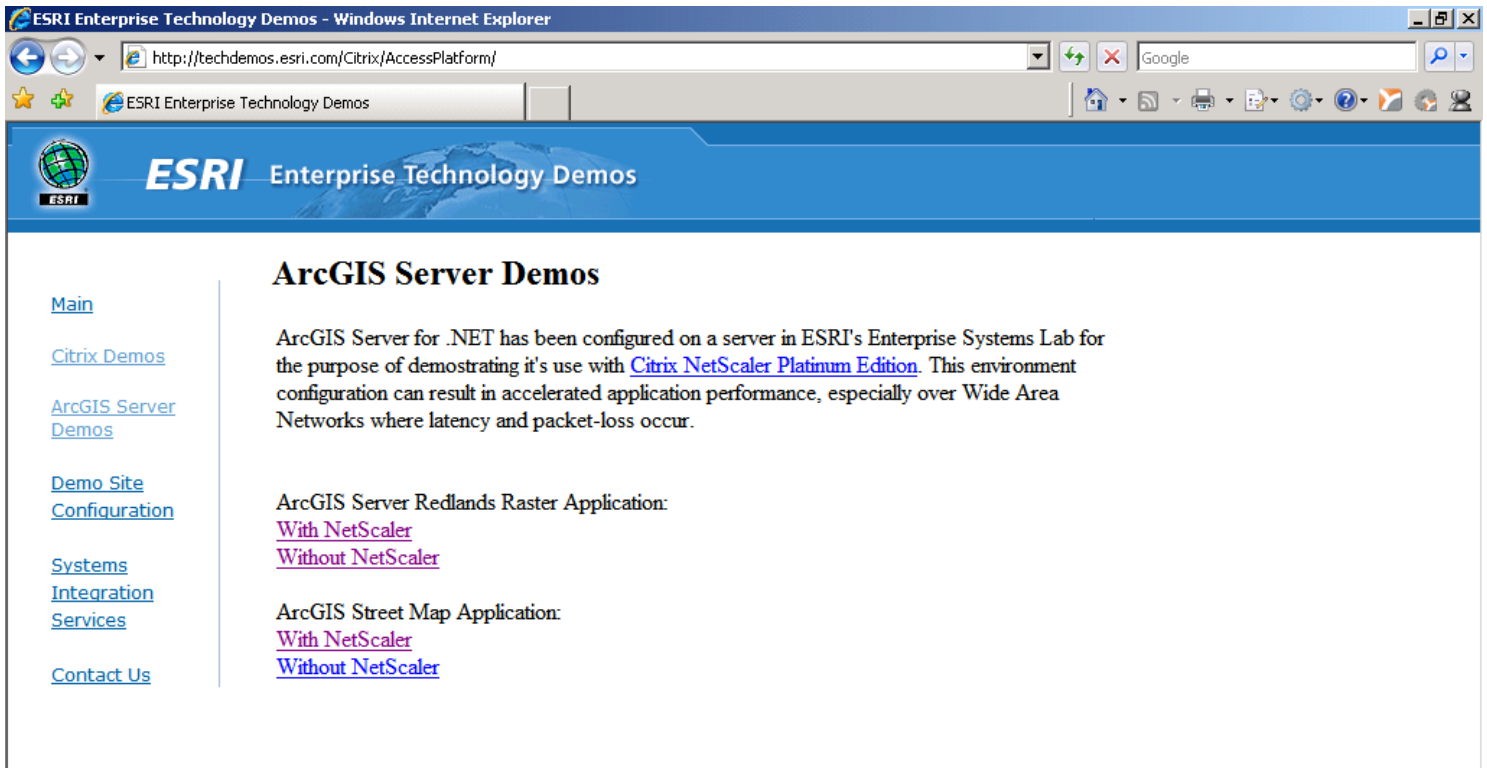
Network Transaction

Response Times

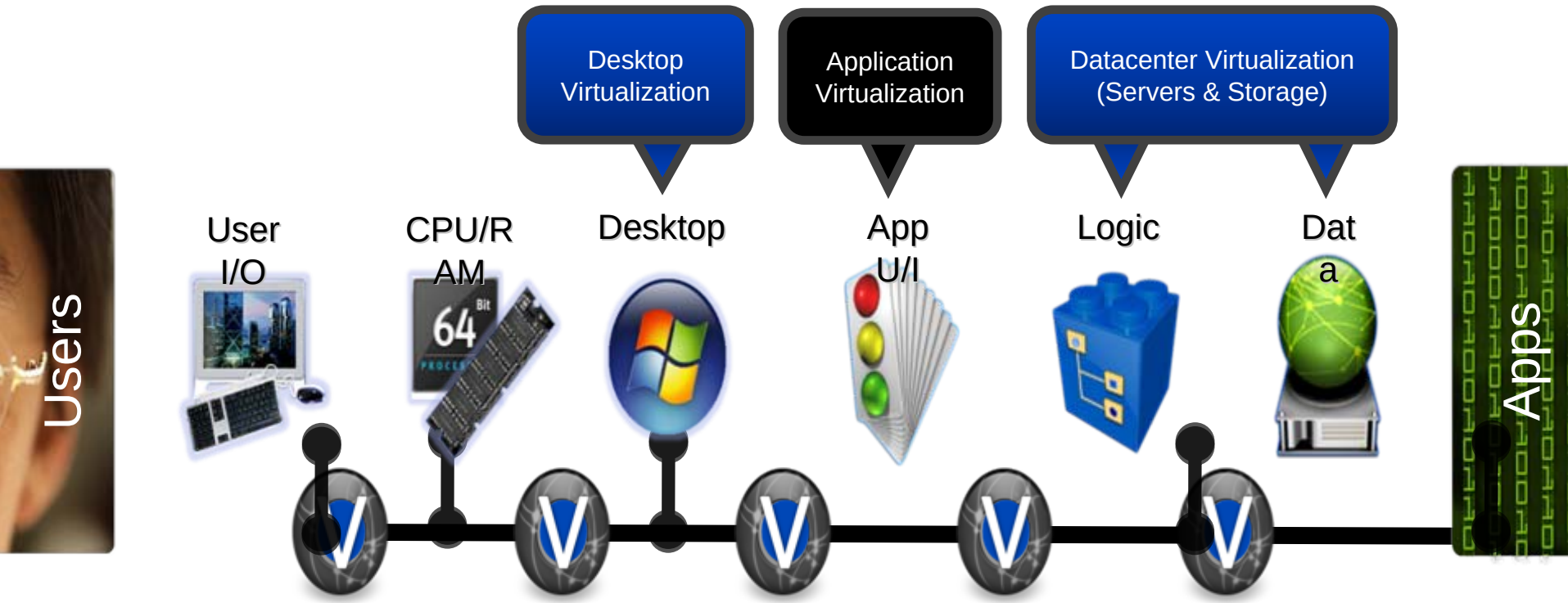
43%

ArcGIS Citrix Demo

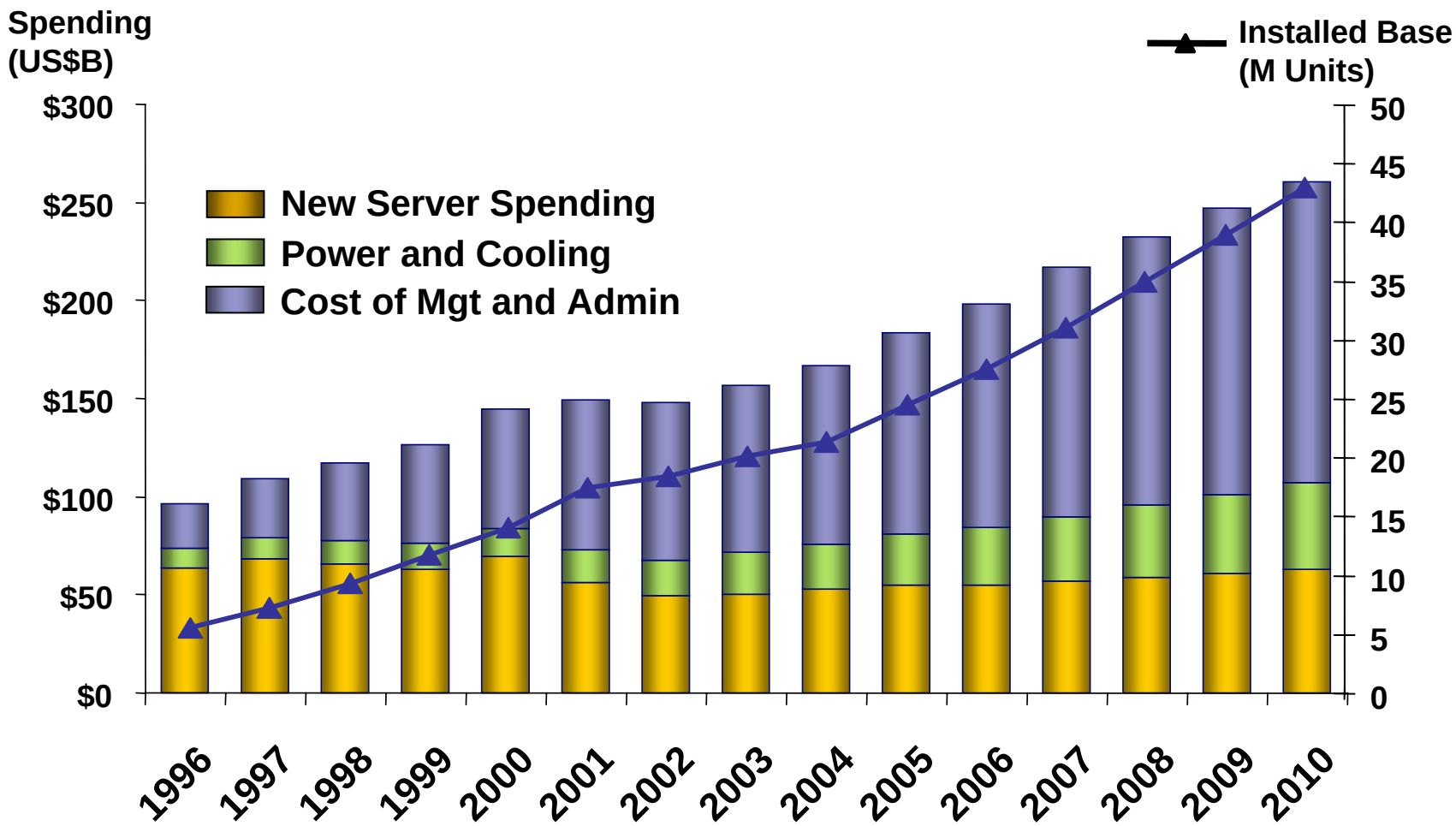
- http://techdemos.esri.com



From Physical to Virtual

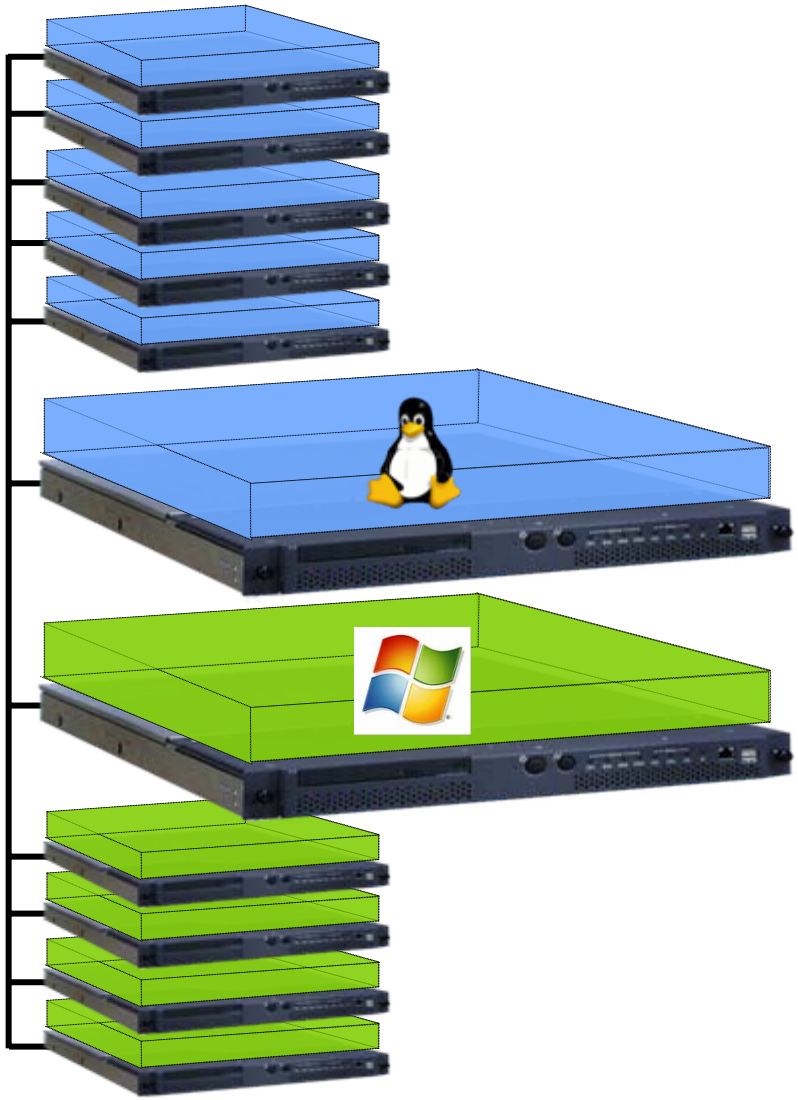


Worldwide Server Market: Cost of Management



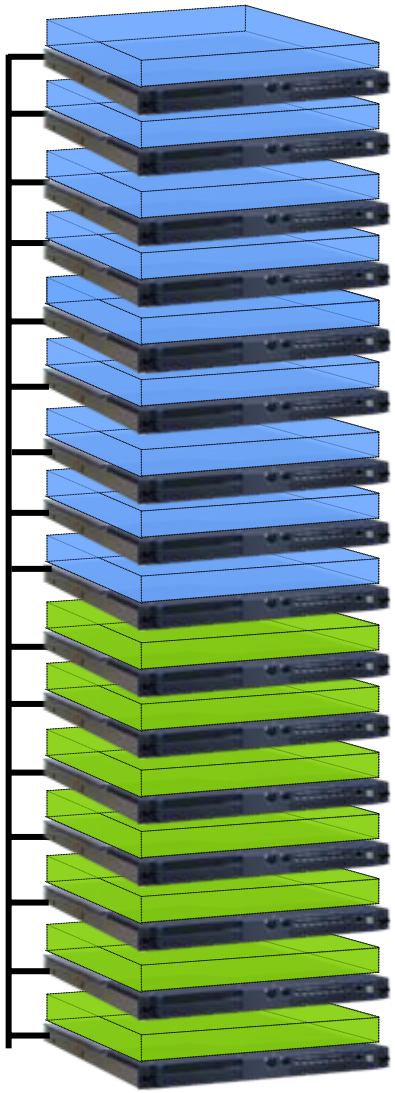
IDC research, 2007

Problem: Success of Scale-out

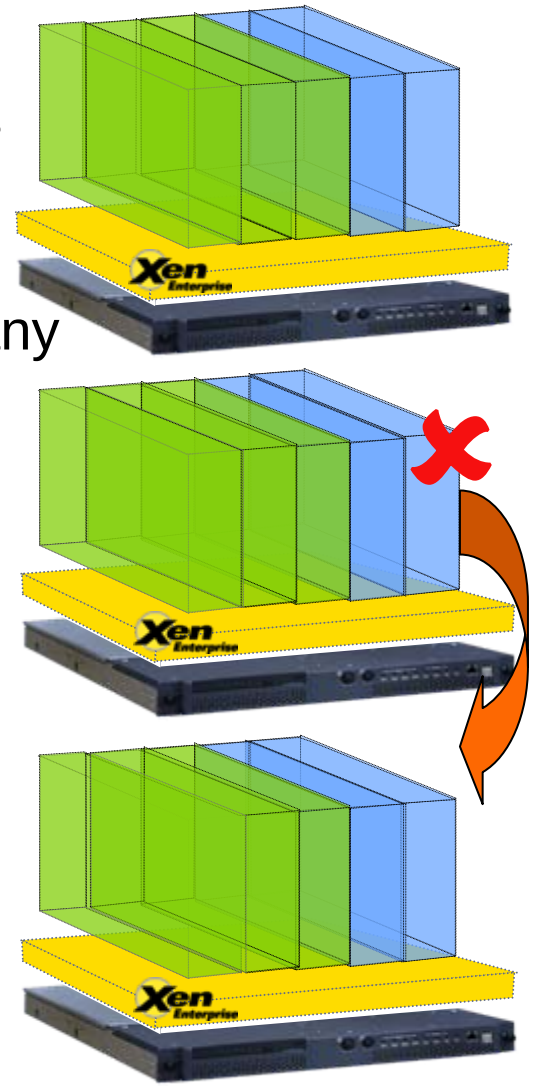


- “OS+app per server” provisioning leads to server sprawl
- Server utilization rates <10%
- Expensive to maintain, house, power, and cool
- Slow to provision, inflexible to change or scale
- Poor resilience to failures

Virtualization Value Propositions

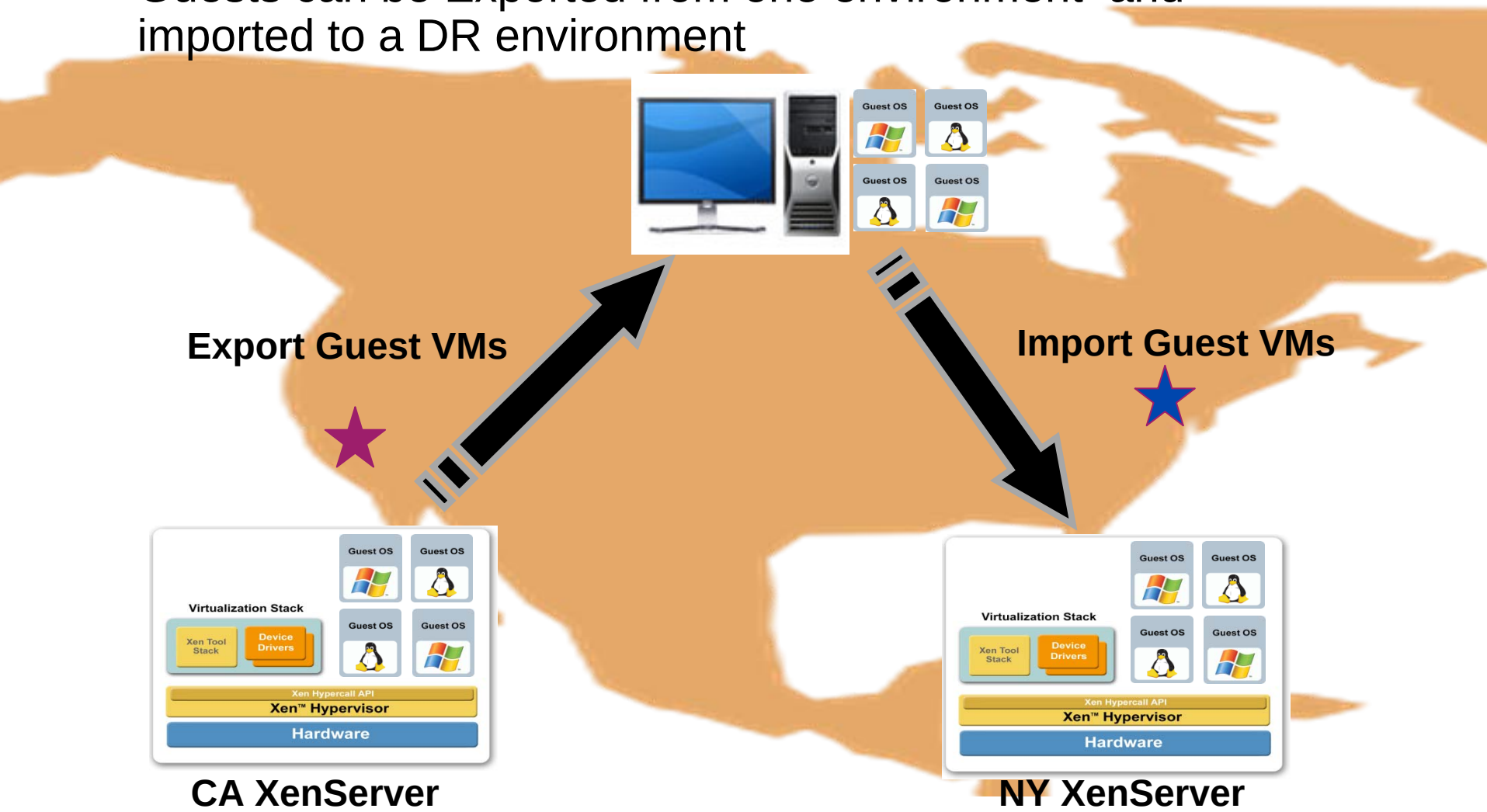


- **Consolidation**: fewer servers slashes CapEx and OpEx
- **"Instant on" provisioning**: any app on any server, any time
- **Higher utilization**: make the most of existing investments
- **Robustness** to failures by "auto-restart" of VMs on failure



DR - Export/Import Guest VM's

- Guests can be Exported from one environment and imported to a DR environment



Questions

Manageability

Application Compatibility

Performance

Security and Saving