The Critical Role of Networking in Enterprise Resource Planning

Introduction

Achieving and maintaining competitive advantage is the raison d’etre for every business around the world. Doing so requires continual transformation of core business processes and better information management of the data associated with these processes. Companies are struggling today, however, with the integration of information from various disparate IT systems and are spending approximately 40% of their IT budgets on maintaining such legacy systems. To meet this challenge, companies are investing significantly in Enterprise Resource Planning (ERP) applications. They view ERP as a key enabler of business process transformation and IT automation. As a matter of fact, gaining strategic advantage is often cited by enterprises as a key reason for implementing ERP.

ERP is one of three enterprise-class applications, including Customer Relationship Management (CRM) and Supply Chain Management (SCM) that companies are deploying to automate business processes. ERP is focused on internal back office operations such as finance, human resources, and inventory management.

ERP is a term for the broad set of activities supported by multi-module application software that helps a company manage important parts of its business such as product planning, order tracking, inventory management, supplier interaction, customer service, finance and HR management. ERP applications automate and integrate business processes across departments and functions. In doing so, they allow information to flow seamlessly from one end of the company to the other and provide a single unified business data environment. Historically, companies were forced to install and manage disparate IT systems for various divergent business processes. These “islands of automation” were typically not designed to easily share information with other systems. While these legacy systems were occasionally connected with each other, the majority were not integrated with other systems. The total organizational costs of maintaining this patchwork of redundant and overlapping systems was high and often more costly than simply installing a new system. This situation then gave rise to the concept of ERP.

ERP implementation results to date have been promising. Some companies using ERP report dramatic gains in information availability and quality, as well as better inventory, supplier, customer, and financial

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Enterprise Resource Planning (ERP) Application Snapshot

Definition. ERP includes the broad set of activities supported by multi-module application software that helps a company manage the important parts of its business such as product planning, order tracking, inventory management, supplier interaction, customer service, finance and HR management.

Benefits. Expected benefits include: quicker information response time, increased interaction across the enterprise, improved order management, decreased financial close cycle, and improved customer interaction.

Costs

- Average ERP deployment leads to a 3 year total cost of ownership (TCO) of $14.5 million.6
- Implementation time spans between 1 to 3 years.
- $1 of software purchase leads to an additional $7 of consulting, hardware, implementation, and training costs.
- Networking costs comprise approximately 5% of the total ERP deployment budget.

As the importance of enterprise applications increases, the performance of the network - which underpins the applications - becomes critical. Thirty percent of enterprises cite integration of new applications as a major network challenge.4 Today’s enterprise networks must be application aware as the traditional distinction between the application, system, and network layers of the solution stack is blurring. Networking, the management of application, system and network interconnections is critical to the performance of business processes that are managed, coupled with reductions in IT costs. Today, more than 60% of Fortune 1000 companies have implemented ERP applications.4 Many midsize and small companies have also installed some form of ERP systems. Leading ERP software vendors include SAP, Oracle, PeopleSoft, and JD Edwards. Market adoption of ERP greatly accelerated in the 1990s with application license sales growing from approximately $1 billion at the beginning of the decade to more than $20 billion by 2003.5 The market is expected to grow at three to six percent annually for the next several years, reflecting the continued importance of ERP.

While using ERP can positively impact traditional business functions, such as inventory management, its deployment in today’s complex business environment relies increasingly on a company’s underlying network infrastructure. If the network over which the ERP application resides performs poorly or goes down frequently, the company loses revenue and incurs additional expenses. For example, the average per minute cost of downtime for ERP is $13,000 based on a recent survey of 250 Fortune 1000 companies. This is higher than the cost of downtime for SCM and CRM, which are $11,000 and $10,000 respectively.7 The network infrastructure provides the critical underpinning that enables successful delivery of mission-critical applications.

The importance of networking to ERP

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Business Process Management and Transformation Enabled by Enterprise Applications

Performance of business processes that are enabled by enterprise applications depends on the underlying infrastructure layer. Specifically, overall performance is defined by:

- application layer availability (uptime) and scalability (capacity to grow)
- infrastructure availability (uptime) and accessibility/capacity (scale)

To effectively measure and manage performance, visibility (monitoring) is required at both the application and infrastructure layers. To understand the critical role and value of networking, it is important to understand the infrastructure requirements of the solution stack layers.

### Application and Infrastructure Requirements

<table>
<thead>
<tr>
<th>Application Layer</th>
<th>Infrastructure Layer</th>
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<tbody>
<tr>
<td>Application Availability (Uptime)</td>
<td>Infrastructure Availability (Uptime)</td>
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<tr>
<td>• Security</td>
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<tr>
<td>• Continuity and recovery services</td>
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<tr>
<td>• Seamless application upgrades</td>
<td>• Service level management</td>
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<tr>
<td>Application Scalability (Growth)</td>
<td>Infrastructure Accessibility (Scale)</td>
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<tr>
<td>• Optimization to accommodate future growth of applications and number of users</td>
<td>• Global and local presence</td>
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<td>• Service level management</td>
<td>• Remote and dedicated access</td>
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<td>Application Visibility (Monitoring)</td>
<td>Infrastructure Visibility (Monitoring)</td>
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<tr>
<td>• Application performance monitoring</td>
<td>• Network performance monitoring</td>
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<tr>
<td>• Application performance reporting</td>
<td>• Network performance reporting</td>
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![Figure 1 – Application and Infrastructure requirements of Enterprise Networking](image)

### The ERP Application Deployment Challenge - Improving External Interactions

Many businesses have realized the promise of ERP. Success stories abound of companies that were able to increase interactions across their enterprise and quicken information response time as well as improve on-time delivery and lower inventories. Nevertheless, it is widely acknowledged that ERP implementations can be problematic. The realization of anticipated benefits from application implementations such as ERP requires attention to a number of key success factors. These include involvement of senior management, inclusion of cross-functional participation, and definition of clear guidelines and implementation workplans.

Although “improving external interactions with suppliers and customers” is a top reason for implementing ERP, few firms have been able to harness their ERP investments to collaborate with partners. As a matter of fact, improving external interactions with suppliers has proven to be a significant ERP application deployment challenge.

Networking is critical in enabling companies to leverage ERP to interact with suppliers. For example, networking enables the linking of separate applications – like ERP, SCM, and CRM – within a company to ensure real time updates and allows for the integration of these systems to multiple external partners. In addition, networking allows companies to add a visibility application to proactively detect changes in business conditions (e.g., change in demand) and to then communicate these conditions to external partners. In these ways, networking is critical to overcoming ERP deployment challenges and to enabling improved implementation success rates.
activities conducted subsequently and reactively to various application implementations do not yield high application performance and can significantly increase the ultimate TCO of the endeavor. It is projected that through 2004, approximately 20% of mission critical enterprise applications will experience severe performance problems that could be avoided by proactive modeling of application/network interactions.

By contrast, approaching the (re) design of the network in unison with and as part of the architecture of the application environment optimizes the infrastructure supporting the application and enables sophisticated modeling of application utilization and system stress testing. In this way, the links between the application and the underlying infrastructure can be better managed leading to high application performance.

**Application Scalability (Growth).** Scalability refers to how well the application can adapt to increased user demands. For example, applications must be scalable to:

- support a growing number of application users within an organization
- add new geographic reach and add new business partners to the enterprise application business system
- integrate new application modules or new applications

Legacy networks are often not designed to support the growth demands of enterprise applications leading to difficult and expensive scaling of these applications. A networking approach that includes application-network architecture assessment services can support application scalability by optimizing new or existing network infrastructures to accommodate future growth of enterprise applications. By understanding how application transaction and data flows result in traffic demands on an existing or new network infrastructure, the network can be designed or optimized to best enable application performance.

**Infrastructure Availability (Uptime).** Availability refers to the uptime performance of the network infrastructure - the network must be secure as well as enabled by continuity and recovery capabilities. By 2005-2006, network service failures resulting from traditional infrastructures will have increased threefold over today’s levels resulting in more than $50 billion in lost e-business revenues.² Highly available networks are (re) designed to ensure optimal application/infrastructure integration and thus application performance by utilizing firewall intrusion detection, built-in redundancy, and self-healing recovery capabilities. Traditional network services generally have substandard security and recovery capabilities leading to significant network downtime and adverse impacts on enterprise application performance.

**Infrastructure Accessibility and Capacity (Scale).** Enterprise application deployments often drive an expansion of a company’s network access and capacity requirements:

- remote users may require VPN-based access to an enterprise application
- business partners such as suppliers may require dedicated WAN access
- customers may have Internet-based access to account information

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Accessibility and capacity refer to the reach, bandwidth capabilities and interoperability of the network infrastructure. A best-in-class networking partner provides dynamic bandwidth allocation to address application-driven network warm spots and combines global network reach with a strong local network footprint. It is rare, however, that IT budgets, particularly those supporting the deployment of ERP applications provide for the deployment of an entirely new network infrastructure. Through the use of network architecture assessments, network performance can be achieved through a combination of targeted network upgrades and resource re-deployment. Neglecting the critical link between the application and infrastructure layers negatively impacts the overarching application and business process performance.

Application and Infrastructure Visibility (Monitoring). Visibility refers to the monitoring and reporting of application and network performance. Traditional network services provide limited application monitoring that is disconnected from network monitoring resulting in an incomplete view of application performance. Moreover, monitoring of the application is generally conducted on an ad-hoc basis with periodic performance reporting. It is estimated that by 2005, most enterprises will spend at least 25% more effort and time than necessary in trouble shooting application and network problems due to a failure to use effective monitoring and testing tools.8 A networking approach, using integrated monitoring/reporting tools, can provide a complete and near real-time view of application and infrastructure performance leading to more effective trouble shooting and better application performance.

The Future of ERP - From an Internal to External Process Focus

An evolution of ERP is underway. Companies continue to focus on optimizing internal resources and processes. However, the prospect of real-time collaboration with external business partners from suppliers to customers is driving an expanded view on ERP. ERP is expected to shift from basic internally focused modules such as finance, logistics, inventory management and human resources to the inclusion of supply chain management (SCM) and customer relationship management (CRM) functionality.

ERPII, as defined by research firm Gartner, is an application and deployment strategy that expands out from ERP functions to achieve integration of an enterprise’s internal and external collaborative, operational and financial processes. The ERPII strategy includes traditional back-end components of ERP with the addition of collaborative components of SCM and CRM. As companies deploy ERPII strategies to support real-time enterprise objectives, the enterprise network supporting internal and external business processes will be increasingly critical.
AT&T: The Networking Partner of Choice for ERP

AT&T's heritage of networking expertise and trusted reliability is being applied to support customers' business transformation needs. With deep networking experience and a large portfolio of solutions, AT&T can help to ensure optimal performance of a customer's mission critical enterprise applications such as ERP. These solutions are delivered across a continuum of delivery modes during the design, deployment, management and evolution stages of a customer's networking environment [Figure 2], providing customers with higher operational effectiveness, financial flexibility and strategic impact from networking investments.

With networking at the heart of every enterprise, AT&T continues to improve the customer's experience, providing innovative, integrated solutions and delivering with quality execution. Dedicated to enhancing the ability of customers to manage complex networking environments in an integrated manner, AT&T continuously invests in its people, processes and a platform to deliver the most robust networking solutions with superior customer support.

Summary

ERP deployment, management, and evolution are critical operational concerns in today's cost conscious business environment. The performance of enterprise applications designed to streamline ERP processes and operations is dependent on the underlying network infrastructure. Companies should take a holistic view of their mission critical application and networking environments and include a partner like AT&T to deliver best-in-class networking solutions.

Sources:


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