Managing Linux with Infrastructure Management Solutions from IBM Tivoli White Paper

Prepared for IBM by
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EXECUTIVE SUMMARY

This White Paper looks at how Linux has become an important part of enterprise computing and how customers whose heterogeneous computing environments now include Linux require infrastructure management solutions that support the Linux platform. It discusses how IBM Tivoli Infrastructure Management solutions enhance Linux to support industry leading customers.

This white paper is meant to provide information to those who have Linux in their existing environment or are considering deploying the Linux platform and need to think about managing this new platform in terms of availability management, information life cycle management and security and provisioning of the heterogeneous infrastructure environment. This paper should be useful to CIOs, IT Architects and Infrastructure Management professionals.

In this White Paper, you'll find:

- A discussion of the status of Linux in enterprise computing

- An overview of the IBM Tivoli Infrastructure Management solutions

- Four customer scenarios, illustrating how customers, across a variety of industries, are using Linux and IBM Tivoli Infrastructure Management solutions to build substantial solutions with significant results

- Some future directions in Infrastructure Management

- Conclusions

INTRODUCTION

The Status of Linux

Linux has progressed from an alternative solution for computer enthusiasts, scientists, and academics to a platform capable of supporting mission critical business applications. It is spreading throughout the business world, in every geography and industry, at unprecedented rates of growth, two to three times the growth of Windows server market.

Linux is a different kind of operating system, and the Linux software itself is distributed by a number of for-profit and non-profit organizations, generally on the basis of their ability to provide technical expertise and support as well as robust extensions to the Linux operating system kernel. Eager to participate in the growing market, nearly every major systems vendor has formulated a Linux strategy around these Linux distributions.

IBM was an early participant in the commercial acceptance of Linux as well as an active supporter of open standards activities. Today, there are more than 10,000 Linux-based IBM customer engagements world-wide. More than 200 IBM government customers have embraced Linux to save costs, consolidate workloads, increase efficiency and move to an e-government environment. IBM attracts customers to its Linux offerings based on its broad range of middleware products. It also offers access to dedicated Linux-based centers around the world which links customers, business partners, and developers, as they move to an open, standards-based computing environment.

IBM middleware(as all IBM software) is built on open standards from high quality code, designed to provide mission critical capabilities that IBM customers demand. Linux offers a flexible, reliable, secure computing platform, providing a robust environment while at the same time reducing total cost of ownership (TCO). Linux and IBM middleware are a powerful combination.

Until recently, Linux was limited to being used on commodity servers, for applications such as Web serving, scalability, and edge-of-the-Web appliances. Today, customers are running more enterprise applications on Linux, both higher value mainstream applications like database and collaboration as well as mission-critical applications, including dynamic IT deployments like on-demand banking, and proven, scalable enterprise-class middleware, from databases and information management software to web application and integration software, systems management, and software development tools. Linux is also showing up in a variety of business applications (like ERP) and in a growing list of industry solutions.

Long Term Value of Linux to the Customer

A significant value of Linux is its low cost. One must consider not only its lower initial cost, but also its low TCO. Together, they add up to significant savings. The basis of the savings is not the cost of the software itself – although the savings here can be substantial – but rather savings in administrative costs; because of its robust architecture and the substantial systems management tools that are now available for Linux.

Another traditional Linux value is the availability of its source code. This means the software's owner (or a developer or consultant on his behalf) can make any necessary modifications to customize the code, matching it exactly to the organizational and application needs.   This, of course, is one of the benefits of Linux being an Open Source platform. Other benefits include its surrounding ecosystem of developers, many of whom provide ongoing development and support for the Linux kernel and for Open Source projects, from the Apache web server to the Firefox browser to the Eclipse development toolset and are available as sources of expertise to any Open Source user.

Linux products are rarely intended to exist in their own silo, but rather are intended to be integrated into the rich, heterogeneous, and sometimes chaotic IT world. They may do this by providing management across heterogeneous environments, participating in cross-platform virtualization schemes, or providing access from a Linux environment into legacy applications running on another platform.

Linux can run on systems of any size, from small –x86 desktops and servers to RISC systems and mainframe computers. Computing needs can be served by scaling out to multiple servers (Linux on commodity hardware is a popular and inexpensive solution) or scaling up to more powerful systems.

Managing Linux with IBM Tivoli Infrastructure Management Solutions

Initially Linux was used in environments where there were few administrative or management challenges and the operating system was not well prepared (at its then early level of maturity) to provide much management. But today Linux is being used across-the-board in all types of environments and for applications up to the most mission critical. This means Linux systems must offer the same high levels of operation and management that any enterprise level system should provide.

For Linux to succeed in such environments, you must be able to eliminate barriers such as:
- Provisioning of IT services by providing high availability supported by event monitoring and event correlation
- Integration of directories across heterogeneous platforms (enabling single sign-on and better identity management)
- Implementation of enterprise level security including controlled access to enterprise data according to the privacy and other compliance regulations.

IBM Tivoli Infrastructure management solutions enable the fine tuning of capacity with IBM Tivoli Provisioning Manager which can provision across heterogeneous systems, including Linux. IBM can also effectively manage storage resources and application data in a Linux environment, including backup and restore of important data as well as other functions required for information life cycle management.

Adding these features both to Linux itself and by offering infrastructure management software to surround it permits organizations to better leverage their Linux investment and to extend it to higher level, mission critical applications. This becomes possible as sophisticated systems management capabilities are added to the Linux environment and the ability to automatically provision and manage ERP software such as SAP. .

Most Comprehensive Management Portfolio of Products and Service Offerings for Linux

All major systems companies (and a few specialty systems management software companies) are now offering some systems management for Linux. But IBM Tivoli offers the most comprehensive portfolio of management software for the Linux environment.

- Among systems vendors (e.g., IBM, HP, and Sun), IBM Tivoli has the most comprehensive management software portfolio for Linux.
- Comparing IBM Tivoli solutions to systems management software vendors (e.g., CA and BMC), IBM provides more offerings generally and more offerings for the Linux platform. Also, IBM's offerings transcend systems management and integrate across the entire infrastructure portfolio.
- Comparing IBM Tivoli solutions to specialty vendors in some aspect of the systems management software market, such as Mercury, IBM can provide a better, more integrated experience, by offering a broader set of products. Companies like Mercury focus on narrower specialties like application management for enterprise applications.

IBM TIVOLI INFRASTRUCTURE MANAGEMENT SOLUTIONS FOR LINUX OVERVIEW

Customer Challenges Addressed by IBM Tivoli Infrastructure Management Solutions

When customers use Linux and the IBM Tivoli solutions together, they will have opportunities to effectively and efficiently deliver IT services in support of their business, while reducing the cost of maintaining and supporting the IT infrastructure. The cost savings can be derived from a combination of the lower licensing costs that are possible in the Linux world and the lower licensing costs that Linux can enable when multiple tasks are converged onto a single server. This allows the customer to use fewer software licenses and to automate the administrative support tasks formerly performed by skilled staff.

IBM Tivoli Infrastructure Management Solutions for Linux span critical IT processes and infrastructure including:

- Storage Management– Protects the organization's data from failures and other errors by storing backup, archive, space management and bare-metal restore data, as well as compliance and disaster-recovery data in a hierarchy of offline storage. Supports computers running a variety of different operating systems, on hardware ranging from notebooks to mainframe computers and connected together through the Internet, wide area networks (WANs), local area networks (LANs) or storage area networks (SANs). Uses Web-based management, intelligent data move-and-store techniques and comprehensive policy-based automation to help increase data protection and potentially decrease time and administration costs.

- Security Management– Delivers a secure, unified and personalized e-business experience by providing authentication and authorization APIs and integration with application platforms. It offers a Single Sign-on and can support multiple remote locations.

- Application Performance and Availability Management (– Constantly gathers information on hardware, software and network devices, and, in many cases, cures problems before they actually occur. Monitor e-business at the component, business system and enterprise levels. Identifies critical problems as well as misleading symptoms, and either notifies support staff with the appropriate response, or automatically cures the problem—decreasing operating costs and improving staff efficiency.

- Configuration and Provisioning Management – Configuration Manager offers integration with Enterprise Directories, distribution across firewalls, and Device Management. Provisioning Manager automates manual tasks of provisioning and configuring servers, operating systems, middleware, applications, storage, and network devices. Through workflows, it automates the manual provisioning and deployment process. It uses pre-built "industry best practice" workflows to provide control and configuration of major vendors' products. Users can also create customized workflows to implement company data center "best practices" and procedures.

- Orchestration and Service Level Management - Improves the return of IT assets and increases server utilization. Helps to boost server-to-administrator ratios by automatically triggering the provisioning, configuration and deployment of a solution into production. This automated process supports servers, operating systems, storage, middleware, applications and network devices. By utilizing existing hardware, software and network devices without rewiring, minimizes implementation times and achieves a faster return on investments. Can also help improve service levels by constantly monitoring resources and requirements for anticipated peak workloads and then triggering the appropriate response in accordance with business priorities.

Imagine a company trying to save operational costs and improve its response times when business dynamics require it to change its IT system configuration. Those sound like contradictory goals. But a company who installs an appropriate combination of IBM Tivoli Infrastructure Management solutions, might find itself not only able to become more responsive but to cut costs enough so that resources could be applied to other urgent needs such as working on new application development and implementation.

Substituting intelligent software for human personnel often leads to such happy endings.

Customer Opportunities Enabled by IBM Tivoli Infrastructure Management Solutions

Just what company is willing to trust a computer system to do – whether to consider it mission critical-ready or not – depends on the availability and resiliency of the system. That is, how often will it fail, how predictable and avoidable is that failure, and how quickly can the system return to service. IBM Tivoli Infrastructure Management Solutions and Linux together provide a robust environment that IT can count on. It isn't magic, but rather the application of the right IBM Tivoli solutions to insure that the system responds as expected. (In IT, no surprises are what the customer is looking for.)

In that case, the system might be used for a customer-facing application such as order entry, confirmation and delivery management.

- IBM Tivoli Access Manager for e-business might be used to secure the system and permit customers to sign on and place orders (or to permit sales reps to sign on, as they visit customers, and to place orders on their behalf).

- IBM Tivoli Monitoring might be used to monitor the health of the system and ensure its consistent availability and service performance.

- IBM Tivoli Provisioning Manager and IBM Tivoli Configuration Manager might be used to restructure systems resources to respond to peak periods of customer ordering (or order status checking) activity.

CUSTOMER CASE STUDIES

Customer usage of expertise and technology can illustrate both the benefits of the technology, as well as show how it might be used in specific markets, solving specific problems. We have selected four market sectors – banking, insurance, manufacturing, and transportation – to provide a variety of examples. These are scenarios, combined stories developed to provide illustrative examples. Specific customer stories may be found at urls located throughout this section.

A Bank Needs to Improve Customer Relations

A European bank found that its branches knew little about individual clients other than the transaction they were performing now. This meant they often missed opportunities to discuss other services with the customer and rarely understood the customer's real relationship with the bank. (Someone could look like the holder of a small checking account, but actually also possess a large savings account, a sizable mortgage, and several loans that had been paid on time, for example, making them an important customer who deserved more time and attention.) The bank needs to meet competition, satisfy customers' rising expectations, and manage IT costs.

Challenges:

- No single view of the customer/bank relationship
- Inefficient, unintegrated silos of individual applications
- Lost opportunities to cross-sell additional services

Solution

- Analyze bank with IBM component model
- Re-engineer IT to provide a single view of the customer
- Integrate applications across silos
- Use Linux to consolidate hardware and software and lower operational costs

Benefits

- Unified view of customer across all of his banking relationships
- Improved customer satisfaction and retention
- New opportunities to cross-sell banking products and services
- More efficient banking operations
- Faster development
- New partnering opportunities via Web Services

.What the bank wants is a single unified picture of each customer. IBM used a component business modeling approach to analyze, transform, and integrate the banking processes. A flexible architecture creates the On Demand environment enabling shorter development cycles and faster time to market. The architecture uses open standards, such as J2EE, making changes as needed in the dynamic banking environment, where new services are constantly being added. The bank will employ Web Services to allow them to add service partnerships as well as their own internally developed products. The bank was also able to consolidate branch servers and use the Linux platform at both the mainframe and the client level. This reduced both software licensing costs and support costs, minimizing total cost of ownership and freeing up funds to support new application development. But the bank didn't have to throw out its existing application knowledge. Core elements could be re-used. Existing hardware in the branches could be combined with Linux at the client level into new solutions. Customers are more satisfied and the bank is more efficient.

A customer banking study may be found at http://w3.ncs.ibm.com/crmd.nsf/allbydocid/JSTS-67NQKL?OpenDocument

An Insurance Industry Association

Individual Insurers were having difficulty meeting tough new regulatory reporting requirements. Their industry association teamed with IBM and an IBM Business Partner to create an automated compliance reporting system. Association members hooking up to the system pay only for what they use—and stay focused on providing insurance. The use of open standards-based technology facilitates integration for all members.

Challenges

- Complex regulatory reporting requirements
- Demand for transparency in financial services transactions
- Need a powerful system in place very quickly
- Need to stick within existing budgets and processes

Solutions

- Build a shared system for insurers
- Meet regulatory reporting demands
- Minimize costs and enable seamless, modular growth as usage expands

Benefits

- Estimated 50% reduction in administrative costs related to compliance reporting
- Avoidance of millions of dollars in upfront provisioning costs
- Consolidate software licensing costs by as much as 90% through the use of Linux Virtual Services.
- Ability to keep IT budgets focused on strategic initiatives
- Ability to incrementally grow the system as usage grows

Insurance companies struggle with the need to comply with new government regulations without disrupting their businesses. They needed to do this without diverting resources—financial or human—from core IT programs which support strategic initiatives. Insurers needed an efficient way to handle the highly variable processing requirements related to reporting. Reporting activity occurred infrequently and average utilization levels of these specialized systems was less than 10 percent.

An insurance industry association, representing all the competing companies was clearly the ideal organization to bridge their interests. The remaining challenge was creating a technology solution that was flexible enough to solve all of its individual members' reporting needs concurrently, while also open enough to integrate with each member's disparate IT system.

The insurance industry association IBM Global Services e-business Hosting Services, and an IBM Business Partner worked together to create, manage, and host a highly automated solution. The system automatically uploads data to a centralized database, creates specialized reports and routes them to the appropriate parties in the insurance pipeline, driven by rules-based triggers.

The system succeeds by meeting a set of complex functional requirements and the use of a metered, usage-based pricing model that lets the association pay only for its daily usage and to charge individual members for what they use. This minimizes upfront costs and optimizes the cost structure going forward. The association expects members to save administrative costs for compliance by 50%, allowing them to channel savings to core projects. An important factor is the use of Linux technology on the zSeries which enables a dramatic consolidation of software licensing costs. The solution takes advantage of IBM's robust infrastructure and its strong knowledge of the insurance industry, the partner's automation platform, and IBM Managed Hosting, Virtual Linux Services.

A case study is located at http://w3.ncs.ibm.com/crmd.nsf/allbydocid/JSTS-64GKUR?OpenDocument

Supporting SAP in a Highly Distributed Manufacturing Corporation

Manufacturing companies often grow by acquisition, buying firms in related sectors to build revenue and market share and permit cross-selling. This company now has about 100 independent, medium-sized, structured companies working together in the business sectors of equipment engineering, production technology, process technology and packaging technology, creating a leading worldwide active system supplier in machinery and equipment manufacturing with revenues over 2 billion Euros and over 12,000 employees.

Challenges

- Bring out-of-date technology up to the latest standards
- Share information across the enterprise
- Continue to support IT independence and decentralization while providing centralized services

Solutions
- Set up a new and completely integrated ERP system
- Set up a competency center providing the individual companies of the manufacturing conglomerate with modern information and communications technology

Benefits

- Cost-effective, clearly structured system environment
- High stability, security and optimum scalability
- Create a centralized competency center providing the individual companies of the manufacturing conglomerate with modern information and communications technology

The Solution is SAP R/3

Individual companies are responsible for their own operating businesses. They also independently decide how and with whom they organize and operate their information technology. The central IT group tries to provide solutions for them as customers. Only a comprehensive system for Enterprise Resource Planning (ERP) across the entire corporation would provide the basis for successful development and information sharing. Several providers were examined closely. System specifications, screening procedures, and classification criteria led to the selection of SAP R/3 which allows the corporation to organize all the administrative and operational business processes to meet strategic goals.

Important features include project management and customized modules for specialties such as missing parts management and spare parts management.

Simply better: Linux

Linux was selected as the operating system platform for its combination of stability and cost-effectiveness, particularly important to value-conscious mid-sized companies.

The company relied on studies which prove that the total cost of ownership (TCO) for Linux is considerably lower than that of other operating systems, both because of licensing and operational savings. The company chose to run Linux on the IBM eServer xSeries, well-suited because of its availability, security, and flexibility, with many IBM mainframe features transferred to the lower-cost Intel server environment.

A case study is located at http://w3.ncs.ibm.com/crmd.nsf/allbydocid/MFRH-5MXNWP?OpenDocument

A Specialty Healthcare Company Reorganizes for Better Customer Service

Challenge

- Meeting the specialized drug and other care needs of patients in an on-demand environment

Solution

- Integrated business process solution, including servers, CRM system, databases and other applications, for multiple call centers
- Move from Dell to IBM Servers for better Linux support and performance

Benefits

- IO throughput is twice as fast as on previous Dell hardware
- IBM servers more robust and reliable, better suited to support 24x7 business

For millions of healthcare consumers, the local pharmacy represents the most efficient distribution method for the drugs that treat common medical conditions. A small percentage of patients, however, need special drugs for life-or-death situations, such as cancer, hepatitis and infertility. Chemotherapy pharmaceuticals, hepatitis treatments and fertility drugs are too specialized for retail pharmacies to sell. This specialty healthcare provider sells such medications to patients upon referral from their doctors. With its 1,450 employees, the firm also supplies specialty drugs and medical equipment to hospitals, clinics and other healthcare institutions.

Just like traditional drug stores, the firm prides itself on excellent customer service. The company standardized its call centers from a number of separate business divisions onto a common IT platform with a single customer relationship management (CRM) solution. The CRM system lets the company better track its customers, anticipate their needs and present them with offers that makes it easier to get the medications and equipment they need.

Initially, the firm chose Oracle 9i database, Real Application Clusters (RAC), application server, CRM, Distribution, Financial and customized pharmacy/medical billing modules. For the database servers, the company chose four Dell 6650 servers running Red Hat Enterprise Linux AS. Two production database servers were backed up by two Dell disaster recovery servers at another company site. .

Building more secure networks using IBM xSeries and Linux

The company experienced issues with the hardware performance of its Dell database servers, because Dell had not tested the SCSI adaptors with Linux. One of the two Dell production servers was down 50 percent of the time. The two disaster recovery servers were also experiencing difficulty. Dell's response failed to correct the problem so by the end of 2003, the firm went shopping for another hardware platform. They selected IBM xSeries 445 systems because their engineering incorporated technologies proven in other IBM server brands. IBM's support for Linux was also an important factor. The solution was designed and implemented by an IBM Business Partner, using the IBM Oracle International Competency Center in San Mateo, California. Oracle specialists from IBM Global Services and the Business Partner tested, configured and implemented the new hardware solution.

Pre-tested Linux solution from IBM

Now the firm is rolling out end-to-end production on all four IBM xSeries database servers and experiencing twice the I/O throughput it was getting from its Dell servers. The scalability of the new servers is much greater; the company finds it can do more with the same real estate. To meet the 24x7 availability needs of the application servers, the company will deploy IBM xSeries 346 system.

Find additional information about this kind of solution at
http://w3.ncs.ibm.com/crmd.nsf/allbydocid/0GLOS-67ERNE?Opendocument&tabgo=CD

Future Outlook

Embracing IT Service Management

IT customers are finding that events mandate an increasing reliance on infrastructure management to ensure that the needs of the business are met. More skilled staff simply can't be the answer as demands increase in every dimension. All of this is happening in a challenging environment where change in the business environment happen faster, IT costs continue to climb, and a first class organization demands increasing integration between its business decisions and its IT infrastructure.

For example:

- For most organizations, system size and complexity are increasing as their organizations and their demands for higher levels of information usage grow to support the business needs. This is only likely to continue to increase over time. Infrastructure management substitutes computing power and corporate policies for expensive (and often less consistent) human eyes and hands.

- Systems are often highly distributed, either because the organization is made up of geographically dispersed parts, or because the business model demands some level of autonomy for local organizations. It may also be due to silos in an organization added through merger and acquisition which are not only in distributed locations, but also use different computing strategies. Infrastructure management can effectively see across diverse and distributed systems, optimizing their usage and management.

- In the past, computer systems were used by the company that owned them and carefully protected from invasion from the outside world. Increasingly, organizations do their work in combination with value chains of suppliers and partners, requiring IT organizations to manage the secure access of outside users to their systems.

- Government regulations and demands for compliance have increased nearly exponentially in the past few years. Companies are scrambling to meet these demands in a time and cost-effective manner. Infrastructure Management can provide the control and audited reporting that such compliance requires.

Increasingly Sophisticated Infrastructure Management Software

Infrastructure Management software is reacting to users' needs by providing increasingly sophisticated function. This includes:

- Infrastructure Management is no longer interested only in how well the IT system is performing, but in supporting how well the business is performing against its strategic goals. In order to do this, Infrastructure Management software will become increasingly integrated with the business, incorporating business policies, goals, and metrics. In the future, Infrastructure Management products will be able to offer advice not only IT performance trade-offs, but also on the effect each potential decision might have on business goals.

- Increasingly, Infrastructure Management offerings will be more sophisticated in looking not just at IT systems, but also at the IT processes the systems are running and at the design of workflows to carry out specific business processes, together with their appropriate implementation and management to optimize both system performance and business goals. We can see pieces of the problem already being attacked, with IBM Global Services, for example, working on Work Process tools and IBM Tivoli Software working on how they will be implemented and managed.

- Customers have found that running individual functions in separate siloed systems is expensive and provides sub-optimal results. Already, we are seeing increasing integration of function, both across existing silos and also by combining functions within the infrastructure management applications.

- In the past, systems, once designed, were relatively inflexible and difficult to change. Today's Infrastructure Management software is designed to permit some change, on the fly, through virtualization and reprovisioning. Tomorrow's offerings will be much more flexible and adaptable, permitting heterogeneous platforms to share in complex virtualization schemes, and including the ability to "buy" additional processing or storage from service providers, where current or near-future needs exceeds in-house capacity.

- We are already seeing increasing amounts of automation built into systems, both in the hardware and into the software. This will increase beyond our imagination. Systems will make decisions automatically, based on policy (to the extent that humans are willing to let them do so), assuring that service level commitments are met, that systems capacity requirements are adequate, that the appropriate mix of applications for users' demands is available on a real-time, on demand basis. To the user, it will appear as if the system anticipates his demands and insures that they are always met. To IT management, it will allow them to use their staff much more strategically, to plan and manage migrations, handle sophisticated problems, and work on new applications.

The Integration of IT and Business

The real difference between IT today and IT in the future will be the level of integration between IT and Business. Already, many companies are hard at work, attempting to align their IT activities with their business strategies. They want their investments in IT systems to be optimized to meet their business needs.

But we have had few solutions to help them do this efficiently. In the future, we will have the automated provisioning that we have discussed above, but we will also have a much more important business tool: IT systems will provide real-time information to the business through a variety of user friendly interfaces. In some cases it will simply provide the information for human decision making and action. Later, it will recommend actions, based on policy, and eventually it may be able to carry out some actions on behalf of the business. For example, an IT system could note that the inventory level for a particular part was growing low and that this was a part which was manufactured internally. It might then automatically order the materials for making more of that part (based on demand history) and schedule its manufacture.

CONCLUSIONS

Infrastructure Management is becoming increasingly important as IT environments become more complex, as IT becomes more integrated with Business, and as everything happens at a faster and more demanding pace. We see three important issues driving what will happen in this marketplace.

Direction of the Linux Market

Linux is already an accepted mainstream server operating system. Every major system vendor is now shipping the Linux operating system on its hardware. Linux is available on products at every level, from the desktop to the mainframe, with an emphasis on –x86 servers and blade servers. With each new version of the Linux kernel, additional features which make it more appealing to the enterprise IT user are added. Linux is now supported in a variety of ways, from both distributions like Red Hat and Novell, from systems vendors like IBM and HP, and from hundreds of software vendors who support the platform with their offerings. In the future, we expect to be able to find applications in every major category running on Linux. Also, we have noted the increasing interest in the Linux desktop, especially in Europe and Asia. We would expect it, too, to become a standard alternative in the future. Linux gives customers another robust choice, based on open standards and open source. It is not free (although versions of the operating system itself may be), but it is often an economical choice where value is important. We believe it is here to stay.

Direction of Infrastructure Management

Infrastructure Management software has come into its own. No longer "just plumbing," it is now an important part of running sophisticated and complex IT environments. As time goes on, it will enable increasingly sophisticated systems, permit increasing integration on many levels, permit heterogeneous systems (including legacy systems) to be seamlessly supported, and significantly increase the automation with which the IT environments are

managed, decreasing the need for battalions of skilled IT staff to manually manage each tiny change in the system.

Infrastructure Management will continue to grow in sophistication and automation. It will also continue to take over new areas of expertise, providing the business with a view of all of its operations from a single place.

Taking Advantage of Infrastructure Management

We are starting to see that not only does Infrastructure Management software address a number of challenges:

- Manage increasingly complex systems
- Support heterogeneous systems
- Provide increasing levels of automation
- Provide integration between IT and business

It also creates new opportunities. The first organization in an industry sector to take advantage of the full range of Infrastructure Management offerings may enjoy a distinct competitive advantage because its IT costs are lower, due to its optimized systems. An organization which uses Infrastructure Management products to integrate its IT and Business strategies may be able to make better decisions, faster. Getting information about your system – and its effect on your business – in real time, may enable you to choose which business to take – and what to pass up as too costly or too risky.

Infrastructure Management is all about helping IT help businesses work better. And it's just getting started.

Wohl Associates is a consulting firm specializing in marketing strategy for new and emerging technologies. The firm's focus is on enterprise software and solutions.

President and Chief Analyst Amy Wohl has been observing, commenting on, and writing about the computer industry for thirty years. She is also editor of the newsletter ***Amy Wohl's Opinions*** and publishes several blogs.