Key technical support considerations for smart IT infrastructures
Executive summary

New business challenges demand a smarter IT infrastructure

Today, everything computes. Intelligence has been infused into things no one would recognize as computers: appliances, cars, roadways, clothes, even rivers and cornfields. Cities are becoming smarter by transforming traffic systems, water systems, security—every possible form of municipal infrastructure. Business process is evolving across every industry from banking to trading and manufacturing. And we are seeing changes in the way people live, enjoying advancements ranging from reduced congestion and pollution to new ways to communicate and collaborate. Every aspect of life is benefiting from the instrumentation, interconnection and infusion of intelligence into the systems of the world.

As a result, enterprises are taking entirely new approaches to their IT infrastructures to make a smarter impact on behalf of the entire organization. According to a recent CIO study conducted by IBM, the vast majority of CIOs and CEOs identify people skills, insight and intelligence, and client intimacy as their top three IT priorities over the next three to five years. As part of accessing skills, a primary consideration must include finding the right level of support that helps optimize the capabilities of new technology being implemented.1

CIOs also universally acknowledge that some of their most important objectives often seem to clash: How can we support the growing demand for service 24 hours a day, 7 days a week while maintaining security and availability? How can we reduce costs while improving service delivery? How can we balance the need for proactive support while serving as catalysts for innovation? The ultimate question then becomes: What is the best path available to achieve these goals?

One compelling answer to that question is the strategy for a smarter IT infrastructure from IBM. A smarter IT infrastructure can help:

- Deliver a shared, integrated and highly available infrastructure that addresses today’s challenges and tomorrow’s opportunities
- Ensure high availability and quality of existing services
- Meet customers’ expectations for real-time, dynamic access to innovative new services
- Contain operational cost and complexity
- Enable breakthrough productivity gains through integrated service management, optimization, virtualization, energy stewardship and flexible delivery choices
- Provide the basis for organizations to gradually evolve their infrastructures to become more resilient, powerful, flexible and cost-effective

This white paper discusses the different support challenges that can confront you when implementing a smarter infrastructure that includes new solutions like cloud initiatives, virtualized environments and other new breeds of computer models. To keep these solutions running daily, you should consider the level
of support that will be required. With technology clearly growing in complexity, can your internal teams adequately support your operational needs now and still concentrate on innovation projects? Will you be able to grow and retain the skills needed to keep these systems running? You may need support on the front end or someone you can team with to address end-to-end, ongoing support. Will you have to work with multiple vendors in different locations, or will you have a single vendor and support contract? And finally, how do you ensure that you are optimizing the value from the new technology you have implemented?

Because no two organizations face the same business context—or have the same infrastructure—no two will take the same path in the pursuit of a smarter IT infrastructure. The results, however, will generally be the same: to achieve more with less—higher service levels, reduced costs and proactively mitigated business risks of many kinds.

**A smarter IT infrastructure implies new support and maintenance challenges**

The higher levels of complexity that come with a smarter IT infrastructure tax IT staffs more than ever. Actionable business intelligence and insights require massive amounts of data to be captured, linked and made available in real-time. Systems must be integrated and available 24 hours a day, 7 days a week to deliver ever-increasing services. Growing numbers of servers, storage and an explosion of devices must be invested in, managed and redirected to meet internal and external demands. Even the solutions to some of these challenges—virtualization, consolidation and cloud computing—bring additional complexities that must be effectively managed.

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**Figure 1:** A smarter IT infrastructure introduces both great benefits and new support complexities to IT

This will come as no surprise to the student of technology history. Inevitably, as newer, better solutions are developed, technical support becomes more complex in tandem. Consider automobiles. Originally pretty basic and simple, the automobile has evolved into an incredibly complex mix of interconnected and interdependent systems. No one would argue that the shade tree mechanic of the mid-1900s is long gone, replaced by a highly skilled technician who utilizes a seemingly complex array of diagnostic and repair equipment. And while we may pine for simpler days, few of us would give up the sophisticated transportation system embodied in a modern automobile.
The same is true of the smarter IT infrastructure today. Once comprised of a relatively simple combination of homogeneous products, today’s infrastructure has become a collection of interrelated hardware and software systems that comprise a whole, such as storage devices. This level of integration introduces new challenges and an integrated support concept—rather than supporting hardware or software, you must now support the solution. In a smarter IT infrastructure, entirely new platforms and classes of solutions will be in place, all requiring skilled and informed support. Enhanced and adoptive support concepts are therefore required to leverage the full value of a smarter IT infrastructure and addressing its new support complexities.

The traditional box-by-box break-and-fix approach is clearly not sufficient to maintain and support this advanced infrastructure. Instead it requires a holistic service and support management approach that is focused on application availability for the end user rather than isolated box availability.

**Newly adopted technologies** required by a smarter IT infrastructure bring the need for new management tools. The adoption of cloud computing and virtualization unchains resources such as processing power, storage, memory or network capacity from physical assets and allows the organization to allocate resources in a dynamic manner in response to changing business needs. This has the effect of adding another layer of sophistication to the IT architecture for support teams to handle. According to most analysts, problem and incident management, are therefore amongst the top five challenges in a virtualized environment, and are often underestimated by many organizations. For instance, isolating technical problems and identifying root causes require new capabilities and supporting automation. Technical complexity formally spread out among hundreds of physical servers is now focused in fewer physical devices, but still involves separate operating systems, middleware, application and data.

**Cascading failure** is another major new complexity to consider, which occurs when a smarter IT infrastructure integrates services and resources across what had been isolated domains. Such integration helps to reduce costs while achieving higher agility, flexibility and scalability. However, it also means that older management tools and processes may no longer work properly, because they presume services are created and managed within one domain, or via one system, and that is no longer true.

For instance imagine a system’s hard drive fails. In the past only the services and applications supported by the particular system with that particular drive would be affected. In a smarter IT infrastructure, though, that hard drive may represent one small part of a pool of aggregated, virtualized storage. Should that hard drive fail, the impact may no longer be confined to a single service.
A deep transparency and understanding of the interrelation between applications and infrastructure components is prerequisite to mitigate the risk of domino effects in a virtualized infrastructure.

Change management represents a fourth complexity. As new solutions or software versions are deliberately introduced to the infrastructure, each represents a new possible point of failure. The effect of this can be multiplied in a smarter IT infrastructure; when multiple domains, each contributing to the delivery of what is now an integrated service, introduce changes concurrently, increased (and often unacceptable) business risk can develop. Improper orchestration of changes means problems can begin at one logical point, application or service, and soon expand to encompass others. One example is the management of dependencies between microcode and release levels of all the interrelated infrastructure elements. A new software version or a firmware update on one element might cause unpredictable issues elsewhere. Furthermore a virtualized environment often requires that updates are consistently performed in a concurrent mode because you cannot simply take particular systems out of production.

Seamless integrated hardware and software support, including a cross-platform microcode and release management, is therefore one of the key success factors in a smarter IT infrastructure.

Even shifting to a smarter IT infrastructure itself can represent a very real challenge to support and maintenance teams—a special and exceptionally extensive form of change management. Such a large transition requires considerable time, energy and expertise to accomplish, and furthermore, the transition must be made in an effective and cost-effective way; it must take place in the least time possible, and create the least impact on the performance and availability of key services. Most maintenance and support teams will lack the expertise required to accomplish this.

To implement a high availability concept for a wholesale and retail provider of food and nonfood products, IBM has provided access to advanced and efficient services and is able to leverage a single point of contact relationship to reduce the client’s IT services support costs. The company also enjoys the support of a fail-proof system environment. Further, the services solution helps the client maintain high availability levels and meet its 98 percent availability requirement.

Problem resolution through vendor support will also become more complex. Many organizations have relied on multiple vendors (solution providers) to support the once simple combination of homogeneous products. When a problem arises with a particular product, IT works with that particular vendor to hopefully come to a speedy and effective resolution. But in a virtualized, consolidated and integrated environment, problems may not easily be isolated to a particular element, and vendors may fail to
take responsibility—instead passing the buck to others. Such a situation will inevitably slow time to solution, reducing service levels or even leading to extended, complete outages, just when the organization’s dependency on reliable IT services is at an all time high.

A single point of accountability across vendors based on consistently agreed and constantly monitored service levels can significantly improve the availability management of a smarter IT infrastructure.

Already in today’s infrastructure, typically 40 percent of labor cost to operate IT is spent on “out-of-bounds” tasks like incident management and firefighting to keep the IT operation ongoing.3 By implementing structured and process-oriented service management and support concepts, there is enormous potential to free up resources and cost in IT operations and redirect them into strategy and projects. The mounting complexity adds to the significant amount of time staff spends on support. In addition, IT support staff skills may be a concern. Having a support partner who can supplement skills, offload tasks and mask complexity is key.

Figure 3: A comparison of the relative spending of labor to operate an IT infrastructure.
New solutions and strategies can mitigate support complexities

Many new solutions and strategies are available to help resolve these and many other complexities that can arise in a highly virtualized, smarter IT infrastructure—if the IT support and maintenance team has both the tools and expertise.

Proactive monitoring, for instance, can help to reduce or virtually even eliminate the business impact of technical problems by continually tracking the health of the IT infrastructure. This monitoring can help anticipate future problems, and notify IT staff by email or pager to take preventative, rather than corrective, action. The health and status levels of key IT-enabled business services can be monitored in real-time dashboards, which deliver easy-to-understand, color-coded reflections of how well (or how poorly) those services and applications are performing against business objectives.

Advanced support capabilities are also useful in this context for automated event aggregation and analysis. Just as with any other aspect of the business, the introduction of intelligent automation, which consistently executes many common tasks, can dramatically improve both the effectiveness and efficiency of IT maintenance and support.

One powerful example: log parsing and analysis. Many applications, systems and services create ongoing event logs, reflecting changes as they occur in real-time. However, manual analysis of those logs will generally be complex, slow and error prone. It is also very difficult to gain a holistic understanding of a complex problem by manually examining and integrating information from such logs. A better outcome can be obtained via automated analysis. Logged events are recognized by intelligent monitoring tools and are correlated to reveal signs of impending failure. Subsequently, the results can be escalated to appropriate IT personnel—reducing the business impact of technical problems, and in some cases, eliminating it entirely.

This is an example of how traditional diagnostic competencies must evolve and grow to serve the new smarter IT infrastructure. Conventional IT teams may require some assistance via new solutions and/or supplemental expertise in order to accelerate the learning curve needed to utilize them. In some cases, where the competency in question is not core to the IT organization’s strategy, best results may come from out-tasking these functions altogether.

Expertise in fulfillment of service-level agreements can become possible in a smarter IT infrastructure, if supported by informed, effective maintenance and technical expertise. A smarter IT infrastructure, of course, is just that—dynamic. This means that service-level agreements (SLAs) supported by a smarter IT infrastructure can now be linked dynamically to shifting workloads. Rather than being defined by static information that does not reflect changing demand levels, the service level can fluctuate in response to real-time information. Such enhanced flexibility in creating and fulfilling SLAs can translate into cost reductions and form the foundation of optimized demand management.
**Flexible support models** can help clients accomplish complex tasks, manage tasks for clients, or out-task individual processes that are problematic.

Pursuing such possibilities, however, will require more than just a smarter IT infrastructure. It will also require the tools and knowledge to address the full range of new support complexities, which will simply be beyond the expertise of many in-house IT support and maintenance teams.

For this reason, organizations interested in developing a smarter IT infrastructure will need a source of trusted support with deep technical knowledge and proven expertise to help enable growth and innovation while optimizing IT support costs and optimizing system availability.

**Why IBM?**

IBM is exceptionally well-positioned as a trusted team member to help you balance the conflicting priorities of managing costs, providing service and fostering innovation. As a leading provider of single support accountability to cover a smarter IT infrastructure in all its aspects, IBM can offer a comprehensive range of sourcing options.

IBM has extensive experience in service management, virtualization, cloud computing, IT optimization and business processes, dealing with thousands of organizations globally in virtually every major business sector. This enables over 23,000 services and support professionals with IBM to capitalize on key insights and strategies with direct access to research and development in a collaborative model across all infrastructure elements.

IBM maintenance and support services are driven by proven, consistent methods: These methods, which provide a collaborative framework based on situation appraisal, problem analysis, decision analysis and potential problem analysis, are designed for the complex support challenges that arise in a highly virtualized, interdependent smarter IT infrastructure. As a result, it empowers IBM not merely to solve clients’ technical problems more quickly and cost effectively, but also to help them link services and applications in new ways, or introduce new services and applications, with minimal business risk or impact on ongoing operations. These methods thus support change over time, to help the infrastructure become more dynamic in the ways the organization requires.

Recently ranked the No.1 external support vendor for server support, capabilities provided by IBM are enhanced through the use of leading support management technology and proprietary databases of technical information, available to address particular maintenance and support concerns such as aggregated event analysis, reporting and proactive monitoring.* Cross-brand, cross-platform support is available for a wide range of environments and platforms, from IBM® System x® to Microsoft Windows, from Linux to VMware. This comprehensive range translates into quantified actionable intelligence concerning which services are performing well, which require attention, and the anticipated business impact. Because IBM support services are continually enhanced by close links with IBM product development and IBM Research, they provide an even more comprehensive, swift and accurate level of support in cases where organizations have deployed IBM technology in the infrastructure. Additionally, IBM can solve the change management puzzle—keeping track of the technical details related to how the infrastructure changes over time via integrated inventory and change management.
IBM can centralize all support operations, giving the organization a single point of accountability while reducing costs. Consider, for example, an organization supported by a large complex infrastructure comprised of many solutions from many vendors. In such a case, IBM can serve as the central liaison among all the vendors involved; when problems occur in any portion of the infrastructure, IBM will work with the vendors to solve those problems, from initial problem reporting to subsequent problem resolution. Managed Support solutions can further include service elements like contract and invoice management, inventory management, consistent service level management with relevant reports and reviews. Consolidating multiple support contracts into a single agreement typically saves 10 - 15 plus percent of maintenance budgets while increasing the availability by 5 - 10 percent.

Figure 4: Modular support services from IBM are designed to optimize support for today and tomorrow.
IBM support offerings are modular, customizable and available at multiple levels to meet organizational needs, strategies and budget. IBM’s full range of support coverage: all hardware, and software, of both IBM and major non-IBM vendor offerings are available in three forms: Foundation, addressing basic needs; Proactive, for more extensive, integrated support designed to drive service levels to new heights; and Dynamic, intended to precisely match specific organizational requirements and contexts.

A smarter IT infrastructure can provide organizations with many opportunities and eventually help them to evolve their infrastructures to become more resilient, powerful, flexible and cost-effective. Organizations that develop a maintenance and technical support relationship with IBM can thus do so with confidence. They will know that as a leading service provider and technology innovator, IBM will continue to deliver extraordinary maintenance and support performance that is driven by a deep commitment to meeting customer needs both today and tomorrow.

**Next steps to take**

Where should you begin on the road to an optimized maintenance and technical support strategy?

A logical first step is an evaluation to determine problem hot spots and identify the most pressing business priorities for revision, as well as opportunities for cost savings. In cases where organizations are considering migration to a smarter IT infrastructure, it should be coordinated with a new maintenance and technical support strategy.

A quantified assessment from dedicated professionals is essential in the development of such a strategy. A Managed Technical Support Workshop provides a better way to begin to establish objectives holistically, with respect to business goals and priorities. This workshop provides a definition of business processes involved, establishes their requirements with respect to IT (including SLAs), determines IT service elements and their associated objectives and defines the key performance indicators (KPIs) needed to verify objectives are met.

IBM can work with your organization to create an optimized maintenance and support plan that is right for the business—leveraging the full power of the IBM services and solutions portfolio to help reduce costs, increase service levels and proactively mitigate business risks.

**For more information**

To learn more about the IBM Maintenance and Technical Support Services, please contact your IBM marketing representative or IBM Business Partner, or visit the following websites:

- [ibm.com/services/maintenance](http://ibm.com/services/maintenance)

Additionally, financing solutions from IBM Global Financing can enable effective cash management, protection from technology obsolescence, improved total cost of ownership and return on investment. Also, our Global Asset Recovery Services help address environmental concerns with new, more energy-efficient solutions. For more information on IBM Global Financing, visit: [ibm.com/financing](http://ibm.com/financing)
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1 The Essential CIO, Insights from the Global Chief Information Officer Study, IBM Institute for Business Value, May 2011


3 IBM IT Management Consulting customer study


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