

Achieving Control Over Data Center Implementations and Operations

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) White Paper
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Executive Summary

Out-of-control data centers that lack reliability and proper security often result in systemic instances of lost productivity and operational cost overruns. By proactively enabling services for controlling access to the infrastructure and monitoring for activity, management decisions can be made to improve data center services that more effectively meet organizational requirements. Data Center management products, such as the Avocent® DSView® 3 management software, HMX™ extender system, and AMX® switch, provide both access control and holistic monitoring services to ensure reliable, secure, and cost effective data center implementations.

The Importance of Establishing Control in Data Center Operations

Information Technology (IT) is the critical driver for nearly every modern day business model. Computing resources are essential to maximizing productivity, enabling business agility, maintaining organizational credibility, and achieving sustainable profitability. As today's enterprises move towards more centralized, service-oriented IT delivery models, the importance of reliable data center implementations to meet business requirements expands significantly. New technologies, such as those supporting virtualization and cloud computing, are moving IT services from desktops and other distributed systems into the data center. This increased centralization of IT services requires the establishment of more robust practices to ensure control of the infrastructure is maintained to enable more efficient, productive, and secure IT environments.

Organizations that lack control over their data centers often experience reduced IT effectiveness, increased operational costs, and more complex infrastructure configurations. This erodes the ability of the enterprise to meet ongoing business requirements or to adjust to rapidly changing market trends. Regulatory compliance goals (such as SOX, PCI, and HIPAA) also become more difficult to achieve, and the often associated weakened security places the business at risk of breaches that may result in the loss of sensitive data, further degradation of IT performance, or catastrophic infrastructure failure. Security breaches are not limited to just network assault, however. Removable storage media (such as USB drives and CD-ROMs) have become more commonplace and provide additional avenues for critical data to be removed and malicious malware to be introduced. Limiting data center access to prevent inappropriate access can reduce risks associated with intentional or accidental service disruption, but may diminish support staff's ability to effectively manage the environment.

Traditional methods of IT management are not sufficient to address the evolving challenges in data center operations. Infrastructure complexity has escalated with the increase in both physical and virtual assets that need to be managed. In fact, in an ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) survey of more than 200 IT professionals, "reduce operational complexity" was identified as the most important driver for introducing data center improvements. Distributed computing models have resulted in server sprawl which has increased the points of exposure to security and system failures while decreasing IT investment value as system resources are wasted on unnecessary idle time. The greater the computing

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density in a data center, the more challenging the management and cost control is for environmental components, such as networking, power distribution, and cooling. Capacity planning also becomes more difficult as new resources need to be squeezed into the limited available space and need to compete for supporting resources.

Most organizations today have recognized the value of centralizing IT operations into a single cohesive management unit for supporting all local and remote IT services across the enterprise. Unified support teams attain better synergy allowing for faster training processes, reduced staffing costs, and prompt incident resolution times. A centralized IT operations team, however, requires unfettered, console-level access to all managed systems both on-site and abroad to facilitate deployment, maintenance, and remediation activities. Since it is not cost or time effective to transport personnel to remote sites for these activities, alternative access must be provided that is reliable, secure, and easily enabled.

In order to address these growing challenges, organizations must introduce new management practices such as server consolidation, infrastructure monitoring, asset management, and service improvements for proactive problem prevention. These established best practices in IT management return control over data center operations back to the businesses they were introduced to support.

Data Center Service Improvement Opportunities

Control over data center operations begins with an identification of IT resources and organizational requirements. An asset inventory should be developed and maintained for all supported IT components, including servers, networking devices, storage units, chillers, power distribution nodes and any other device necessary for day-to-day data center operations. The asset inventory should be documented in an easily accessible online library and should include detailed information about the model, design, usage, and performance of each item in the support stack. Concurrent with this activity, enterprise requirements for IT services should be prioritized according to the value they bring to the business. By correlating types of assets and their status with prioritized organizational requirements, informed decisions can be made on how to reengineer data center resources to maximize IT effectiveness.

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Nowhere are opportunities greater for operational efficiencies and cost reductions more attainable than through the consolidation of servers and other IT components. Candidates for consolidation

can be identified as those with excessive unused system resources, such as those that perform little processing or have significantly available storage space. These low-use systems can be combined and deployed on one or a few more powerful systems, such as blade servers, so that system resources are shared and balanced. Virtualization implementations can logically delineate the server instances so that end users still experience isolated computing environments. The old systems can then either be retired or repurposed, eliminating the need to purchase new units. In addition to the capital expenditure savings, fewer resources in a data center translate into lower operational costs because of the reduced environmental requirements – such as for power and cooling – necessary to support them. Systems management and security practices are also simplified with fewer components to maintain and less opportunities for inappropriate system access or points of failure. This frees up support staff to focus on service improvements that will increase overall IT reliability.

Data centers that lack control experience a considerable number of infrastructure failures. There are two principle reasons for this to occur: the environment is not monitored to identify potential problems and/or there is a failure to perform root cause analysis. When IT failures occur, administrators often react by resolving the symptom of the problem rather than the root cause. For instance, they may resolve a server heat dissipation problem by reducing system processing rather than replacing the broken fan or poor ventilation that is actually causing the problem. This only temporarily resolves issues and they are likely to reoccur, requiring more administrator time for examination and resolution. This break/fix cycle of systemic “firefighting” can be ended with the introduction of monitoring tools that enable a holistic view of systems across the data center. In this way, related problems can be correlated even if they occurred on different IT components and the root cause can be quickly determined by evaluating incident details such as time stamps on specific events. Similarly, user activities should be logged to easily identify which individuals accessed the systems under investigation and what actions they performed. This not only speeds time to resolution on problems, but also adds a level of accountability for a more reliable support staff. The faster root causes of problems are identified, the less of an impact they will have on business operations. According to EMA primary research, the average time to resolution with IT failures is between 1 and 4 hours, with roughly half that time spent just identifying the cause, so if failure points are identified more rapidly, business impacting downtime and performance impacts can be dramatically reduced.

Investment in management solutions is critical to establishing control in a data center by enabling the access and holistic view into the infrastructure from which informed decisions can be made on service enhancements such as improved reliability, security, and cost effectiveness.

Implementing a Controlled Data Center Infrastructure

Fortunately, there are enabling technologies available today that can help establish control in a data center. In an EMA survey, 77% of organizations that have introduced automated solutions for data center management reported having seen measured improvement in data center profitability. Already discussed is the need for automated solutions for asset discovery, monitoring, and tracking. These solutions should monitor critical system performance indicators so that proactive problem prevention processes can be initiated. By providing a holistic view of the data center, these infrastructure monitoring tools will provide the critical IT intelligence for identifying opportunities for consolidation, streamlining data center configurations, and improving cost efficiency in environmental components such as those for power distribution and heat dissipation. Additionally, resources should be employed that enable full access to both local and remote IT facilities while limiting that access to only authorized individuals.

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As an example, Avocent offers several solutions designed specifically for enabling organizations to establish control over their data center implementations. The Avocent DSView 3 management software, for instance, can be installed on a physical appliance – such as a KVM appliance, console appliance, server processor gateway or power distribution unit (PDU) – to provide IP-based access to a broad range of data center computing and infrastructure resources. Console level access is provided so

that out-of-band access is enabled for managed endpoints even if networks are down and the systems are powered off, allowing uninterrupted access during system restarts, installations, and firmware activities. Connectivity to remote data centers is enabled without the need for dedicated physical connections. With all system access limited to this single point of entry, extensive logging capabilities of the DSView 3 software can ensure user accountability by identifying when and by whom activities were performed.

DSView 3 software provides a holistic view of the data center infrastructure enabling coordinated root cause analysis across multiple IT components and providing critical information on system usage to drive service improvement projects. Not only are server consolidation initiatives simplified by helping to identify candidates for migration, support for blade servers can ease the implementation process for consolidation efforts. With the DSView 3 management software, energy consumption details can be accurately monitored and measured directly from the PDUs so that key decisions can be made on how best to load balance power for greater efficiencies and to more effectively disperse heat. The solution also proactively prevents electricity cost overruns by alarming on excessive use or by establishing hard maximum thresholds for power use.

Avocent also offers the HMX extender system, which is a fully self-contained physical appliance that provides server administration and connection management control from a centralized interface. The digital appliance is easily deployed over a LAN and provides real-time access to IT resources. HMX physically connects to graphics cards, and both USB and Audio ports on managed servers and provides a switchable extender matrix over a standard network. The HMX system is secured with 128bit AES encryption and allows access to the physical server to be restricted to specific designated users or groups of users. High availability of IT services is also facilitated. In the event a primary server fails or requires downtime for maintenance, users can be dynamically moved to an alternate system so that their productivity is not diminished while the primary server is recovered. The appliance also allows for the automation of administration, patching, and deployment of system resources so that problems can be remediated before they impact the business. Avocent offers an analogue edition of the appliance, the AMX switch, that operates over a standard UTP connection and provides similar functionality to the HMX system, connecting directly to the server console, but without converting input to IP packets.

The two primary requirements for establishing control of data center operations is regulating access to IT resources and enabling holistic monitoring for improvement opportunities. Accomplishing these requires the adoption of access components, such as those offered by Avocent, that provide both the security and the agility necessary for organizations to reliably and cost effectively achieve business IT goals.

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EMA Perspective

Concerns over data center reliability are accelerating. Even as IT has transitioned from being an enabler of business production to now often being the core services driving profitability, the value of centralized resources in the data center have expanded to include more mission critical activities. Managed services, either by dedicated internal operations teams or external service providers, are being rapidly adopted as the standard model for business IT management. Centralized services rely increasingly on consolidation, virtualization, and cloud computing initiatives to improve opportunities for greater computing efficiencies and cost effectiveness, but also have increased the necessity for greater control over data center implementations. Streamlining IT operations with greater agility, reliability and security are at the heart of the new paradigm in consolidated IT services. Control over data center operations, access, and facilities not only helps achieve organizational IT requirements, but also provides opportunities for service improvement. Utilizing more robust management tools, such as the Avocent DSView 3 software, HMX extender system, and AMX switch, can help end the break/fix cycle of reactive “firefighting” and enable processes for proactive problem prevention and improved data center reliability.

About Avocent

Avocent (a wholly owned subsidiary of Emerson Electric Co.) delivers IT infrastructure management solutions that reduce operating costs for IT environments via integrated, centralized in-band and out-of-band hardware and software. Additional information is available at www.avocent.com.

About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that specializes in going “beyond the surface” to provide deep insight across the full spectrum of IT management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help its clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise IT professionals and IT vendors at www.enterprisemanagement.com or follow [EMA on Twitter](#).

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