

EMC Ionix: IT Management Optimized for the Virtual Data Center

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMATM) White Paper
Prepared for EMC

July 2009



IT MANAGEMENT RESEARCH,
INDUSTRY ANALYSIS AND CONSULTING

Table of Contents

Executive Summary	1
Market Evolution – the Challenges of Managing Change.....	1
The Move to Virtualization.....	2
Virtualization and the Cloud.....	4
A Next-Generation Management Architecture to Cope with Change.....	4
EMC Ionix.....	5
EMC Ionix as a “Next-Generation” Management Architecture	7
Collaborative IT and the CMS	7
EMC Ionix’s Layered Architecture Delivers Dynamic Insight and Model-based Control	8
EMA Perspective.....	8
About EMC	9

Executive Summary

In July of 2009, EMC® introduced EMC Ionix™ – a solution spanning network, applications, systems, and storage management. The introduction of “EMC Ionix” as a new family replaces prior product line names associated with EMC’s resource management portfolio, such as *Smarts*, *Voyence*® and *Infra*® – most of which were acquired through a series of targeted acquisitions over the last five years. However, EMC Ionix represents much more than a new name – it solidifies a framework for EMC’s innovative architecture optimized to support more dynamic, virtualized infrastructure and service environments, including cloud-related models. This ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) report introduces the EMC Ionix portfolio and architecture in market and industry context.

Market Evolution – the Challenges of Managing Change

The challenges of managing change and managing complexity go hand-in-hand when it comes to current IT and service provider environments. One rule in management has been that aging infrastructure and application types don’t go away – or if they do disappear they disappear very slowly. This means that IT organizations face challenges with frame relay and ATM side by side with multi-gigabit Ethernet. It means that systems may aggregate across many multiple platforms and models spanning Linux, UNIX and Microsoft OS environments. And it means that Web-based applications, Web 2.0, and SOA-based Web Services exist side by side with legacy client/server applications in most enterprises and organizations. Finally, IT’s concerns are expanding into far more sophisticated models for understanding power consumption and utility-related infrastructure, as well as in some cases directly supporting business infrastructures in such verticals as manufacturing, transportation, and business applications in e-commerce, healthcare and financial services.

At the same time, the pace of change has increased exponentially – and with the advent of virtualization that “exponential increase” can reduce windows of change from what used to be days and weeks into minutes and seconds. Yet, as EMA and many other analyst sources have observed, most service performance disruptions – well in excess of 60% – are caused through intentional and/or unintentional changes, as new devices are provisioned, upgraded, or withdrawn, new application services are provisioned, upgraded, or extended to new audiences, and changing business and personnel conditions force changes in processes, priorities, outreach and consolidation.

The industry and the market are responding to these demands through a combination of enhanced process awareness, through such resources as the IT Infrastructure Library (ITIL), and more innovative architectures that support more modular and flexible designs. The rise of the CMDB and ITIL v3’s notion of the Configuration Management System (CMS), the growth of automation, advances in analytics and more flexible-role-based approaches to visualization and business alignment are all necessary steps forward if IT organizations and their service provider counterparts are to meet the business and technology challenges of 2009 and beyond.

The Move to Virtualization

EMA defines *virtualization* as: “a technique for abstracting the physical characteristics of computing resources from the way in which other systems, applications, or end users interact with those resources.” Virtualization can include OS virtualization, server virtualization, application virtualization, desktop virtualization, network virtualization, storage virtualization, streaming, and grid and cluster virtualization, as examples. The appeal of virtualization, not all of it (such as VLANs) being new, goes far beyond technology. Virtualization can enable faster deployment of the new systems and applications needed to support critical new business products and services. It can also promote superior business continuity as well as significant cost savings in terms of infrastructure optimization.

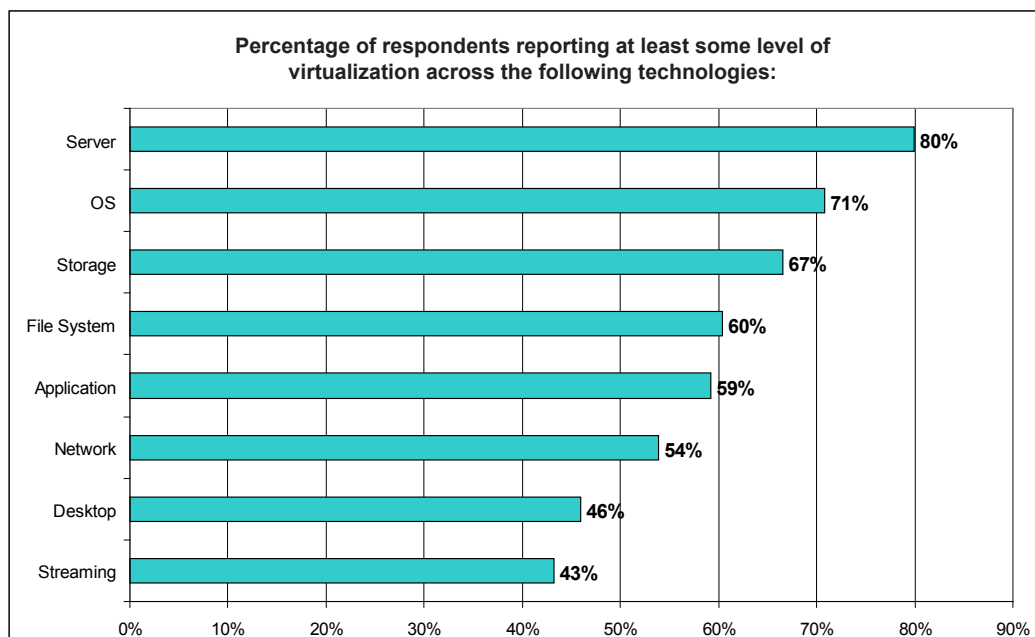


Figure 1: Priorities in virtualization technologies (“Virtualization and Management: Trends, Forecasts, and Recommendations” EMA, 2008)

But virtualization also poses some distinctive management challenges – challenges far more daunting than some of the initial, tactical pilot deployments exposed – which as a class reflect broader management challenges, only in a more heightened form. And if these management challenges aren’t effectively addressed, then the benefits of virtualization cannot be fully realized. For instance, VMware automatically moves applications from one server to another for performance and load balancing. As a result, the volume and frequency of change to the virtual environment is dramatically escalated from traditional infrastructures. This requires a dynamic awareness of the relationship between the application itself and the infrastructure fabric that supports it. And while this demands a more cohesive approach to managing the virtualized environments, just the opposite has happened in many organizations where niche, virtualization-savvy “swat teams” have led to an increase in technology fragmentation with siloed management groups working independently from one another.

Early deployments of virtualized systems exceeded expectations in terms of consolidating floor space and server consolidation, but failed to meet expectations in terms of reduced software costs, lower administrative overhead, reduced downtime, meeting expected SLAs, and improved security and control. (“Virtualization and Management: Trends, Forecasts, and Recommendations”¹, EMA, 2008).

In a recent report, “Overview of Best Practices for Virtualization and Virtual Systems Management (VSM)”², EMA itemized critical management disciplines for addressing the requirements of virtualized systems. Just a partial list includes capabilities for:

- Discovery, inventory and asset management
- Capacity planning and management
- Provisioning
- Change and Configuration management
- Compliance auditing and reporting
- Performance and availability monitoring
- Security administration
- IT cost management
- Automated backup and recovery
- Disaster recovery/ Business Continuity
- Event Management/ Console Automation
- IT Process Automation

This same report proposes the following key metrics for establishing best-of-class solutions for managing virtualized systems.

- Mean-Time-to-Repair (MTTR) – best performers should be able to repair VM downtime in 30 minutes or less.
- Service Level Agreements (SLAs) – best performers should achieve five nine’s availability
- Administrator to VM ratio – in optimized environments should support a ratio of 150 VMs per administrator.
- VM Deployment time – should be less than 30 minutes in best-of-class settings.
- Power consumption – should be dramatically reduced, especially with the support of advanced event management and capacity planning.
- Server consolidation rates – requirements for physical servers should be reduced by 35% or more in best-of-class environments.

1 <http://www.enterprisemanagement.com/research/asset.php?id=721>

2 <http://www.enterprisemanagement.com/research/asset.php?id=1122>

Virtualization and the Cloud

Cloud computing has grown significantly in industry attention in recent months, as technology providers are seeking more cost-effective ways to deliver services, and businesses are looking for application capabilities that are increasingly dynamic, flexible and efficient. It is also fairly self-evident that virtualization stands at the heart of “*cloud computing*,” which represents a dynamic way of

The evolution towards more dynamic and cost-efficient infrastructures, as well as towards more modular and cost-optimized application architectures, is a natural backdrop for understanding the shifting requirements reshaping IT management architectures.

leveraging infrastructure and application resources with associated “usage-based” costs. EMC has rightly targeted the “private cloud” – in many respects a stand in for the “virtualized data center” with hooks into outsourced cloud capabilities – as an environment that will place significant stress on conventional management architectures, and so conversely, one that will also highlight the advantages of EMC Ionix. The evolution towards more dynamic and cost-efficient infrastructures, as well as towards more modular and cost-optimized application architectures, is a natural backdrop for understanding the shifting requirements reshaping IT management architectures. Collectively, these changes will be even more dramatic than the shift from mainframe towards client/server architectures in the 1990s.

A Next-Generation Management Architecture to Cope with Change

EMA believes that a “next-generation” management architecture is gradually evolving across the industry, which it first put forward in May 2004 “Next-Generation Management Architecture: a Perspective by EMA.” Through advances in automation, analytics and in particular the advent of CMDBs and Configuration Management Systems, this vision of future management architectures is beginning to become a reality in the industry today.

The chief attributes of this architectural vision include:

- *Modularity* – the ability to decouple information gathering from analytics and process automation. The report predicted a future of “federated data stores” to support “cooperative analytic engines,” which bears some resemblance to ITIL’s Configuration Management System (CMS) and Service Knowledge Management System (SKMS).
- *Integration by “function” rather than by siloed tool design* – which allows for new types of modularity and integration. As can be seen in Figure 2, the EMA Semantic Model presents a decoupled stratification of *input/ data gathering, discovery and relationship building, management data repository, integration, analytics, process automation, visualization and business alignment*. By decoupling and integrating these horizontal functions into cohesive functional resources, greater efficiencies can be achieved across multiple, best-of-class solutions.

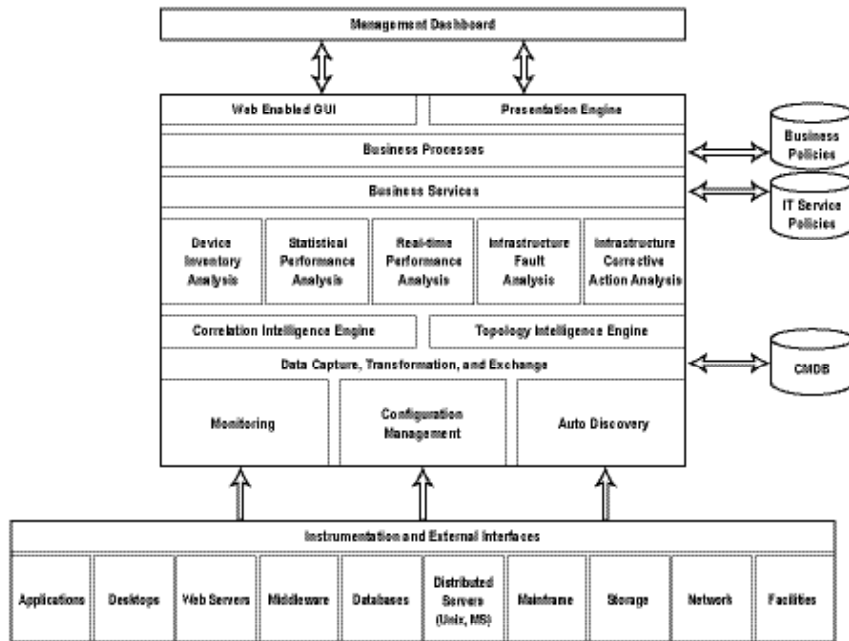


Figure 2: The EMA Semantic Model

- *Analytics and Automation* – now become key differentiators. Once a “super highway” of cohesive information is enabled, IT organizations will be able to invest in more effective analytics and automation capabilities that can leverage more flexible and consistent information sources. This in turn will inspire more competitive types of analytics and automation platforms. In subsequent work on automation, EMA has recognized the need to combine *human-to-human* (e.g., workflow), *machine-to-machine* (e.g., load balancing), and *human-to-machine* (e.g., configuration or release management) in a unified, automation architecture.
- *Visualization* – can be viewed now as a common layer of data access across multiple sources, including across multiple brands. Policies and role-based requirements, versus siloed tool-set designs, should in the end determine what IT professionals and executives interact with for decision making and active management.
- *Business alignment* – is now enabled with powerful and dynamic underpinnings. This typically means linking applications to business processes from an impact perspective. In the future, the relationship may also become bi-directional, as shifting business dynamics and market dynamics can impact application performance as well as vice versa.

EMC Ionix

EMC has made arguably the industry’s single most cogent and deliberate set of investments over the last five years to establish and then broaden its resource management capabilities. EMC’s original anchor in resource management was EMC ControlCenter® for storage management, which provides performance, configuration and optimization capabilities for storage arrays, and SAN and NAS environments, including policy-based governance for application-to-storage-related transactions.

EMC significantly expanded its portfolio in December, 2004, with its acquisition of Smarts – an advanced discovery and analytic (root-cause) capability for managing networked environments in support of service delivery. Since its acquisition, these analytics have been extended to support storage environments. In June of 2006, EMC acquired nLayers® for application dependency mapping, including visibility into application flows over the network in near real time. EMC acquired Voyence in October of 2007 for network configuration management. In March of 2008, EMC acquired Infra for service desk, workflow, knowledge management and CMDB support. And most recently, in May of 2009, EMC acquired Configuresoft® for systems configuration and advanced change-management-related analytics. However, most significantly, EMC has been very active in integrating its acquisition targets – such as nLayers with Smarts and VMware®, and enVision® (for security from RSA) with Voyence – as just a few examples.

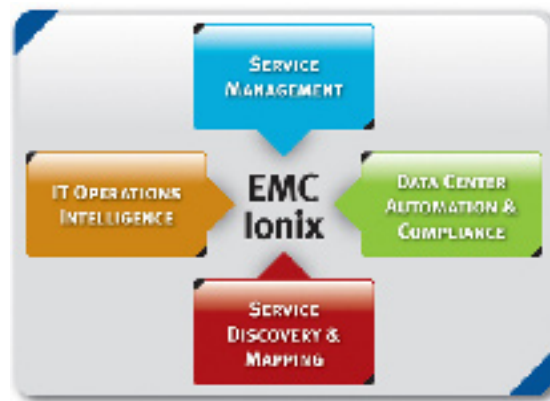


Figure 3: The EMC Ionix Portfolio

A summary of the EMC Ionix portfolio includes:

- *EMC Ionix for Service Management:*
 - EMC Ionix Service Manager – which is the overarching suite, with support for workflow, problem and incident management, knowledge management, change and configuration management, service level management and a core CMDB. Key capabilities within the suite include:
 - Ionix Service Desk
 - Ionix Service Portal
 - Ionix Service Workflow
- *EMC Ionix for Service Discovery and Mapping,* which includes a federated set of well-integrated resources:
 - Ionix Application Dependency Mapping
 - Network Layer 2 and 3 discovery
 - Storage data path discovery

- *EMC Ionix for IT Operations Intelligence* for managing dynamic infrastructure performance and availability in support of service delivery
 - Ionix Service Assurance Manager
 - Ionix IP Availability and Performance Manager
 - Ionix Server Manager
 - Ionix Storage Insight
- *EMC Ionix for Data Center Automation and Compliance* – for actively managing change and optimizing infrastructure in dynamic and virtualized environments – with support for governance and risk management
 - Ionix Configuration Analytics Manager
 - Ionix Server Configuration Manager
 - Ionix Network Configuration Manager
 - Ionix Storage Configuration Advisor

EMC Ionix as a “Next-Generation” Management Architecture

The introduction of EMC Ionix goes well beyond being simply a naming change. It represents both a further commitment to cross-portfolio integration, and an evolving, open architecture optimized to support service management across increasingly dynamic and/or virtualized infrastructures. As a result, the EMC Ionix should be viewed as an evolving architectural model rather than merely a collection of unilaterally integrated management tools. The EMC Ionix architecture as it develops follows The EMA “Semantic Model” and “Next-Generation Architectural” model surprisingly well.

EMC Ionix represents both a further commitment to cross-portfolio integration, and an evolving, open architecture optimized to support service management across increasingly dynamic and/or virtualized infrastructures.

Collaborative IT and the CMS

In coming months, EMC will begin to flesh out its notion of “Collaborative IT,” which will include Mashups to enable real-time access to multiple management sources based on policies and role requirements, exposing data through Web Services as a series of XML responses. For instance, network operators will want to see more granular performance data in context with topology and applications, than say a service desk professional who is more likely to be concerned with individual desktop issues, or broader service status and impact.

When this versatile notion of “Collaborative IT” is combined with the EMC Ionix CMDB, and EMC Ionix for Service Discovery and Dependency Mapping, it approaches being a next-generation CMS, in which multiple technologies are combined to enable reconciled versions of the “truth” to support multiple constituencies across IT.

EMC Ionix's Layered Architecture Delivers Dynamic Insight and Model-based Control

EMC's investments in model-based analytics for diagnostics and root cause, and its investments in data mining capabilities for governance and "continual service improvement" via EMC Ionix Configuration Analytics Manager, will provide significant value at the "analytics layer" to enable better insight and control of complex environments. EMC's growing investments in automation – from workflow, to active configuration, to advanced diagnostics, to dynamic VM optimization, collectively establish a clear "automation-layer" strategy to accelerate operational efficiencies and minimize risk. And finally, EMC will be gradually introducing a unified, browser-based visualization layer in stages over the course of the next several years to enable a more unified and consistent way of working across domains.

This approach will offer customers more optimized capabilities for applying advanced intelligence to multiple data sources and automate processes more strategically without incurring siloed "train wrecks." It will also provide a natively open architecture able to engage other brand investments at multiple layers to support multiple ends. This will allow EMC customers to apply EMC Ionix investments in a modular fashion, with significant impact at both a component and a portfolio level.

EMA Perspective

EMC's Ionix architecture reflects a more flexible approach to solution integration and automation than has been available in more traditional models. It is fundamentally an open framework with multiple technologies to enable communication and activation of different management resources. And it brings together a more integrated approach to security, compliance and change management than has been available in more legacy-driven designs.

EMC's focus on support for the road to virtualization underscores its commitment to ensure that its management suite can support extremely dynamic and demanding environments, and the more service-oriented management processes that IT organizations are beginning to implement.

As should be apparent by now, EMA is very pleased to see EMC's Ionix family suite coming together so strikingly, not only as a product family but also as a new wave in management solution design. EMC's focus on support for the road to virtualization underscores its commitment to ensure that its management suite can support extremely dynamic and demanding environments, and the more service-oriented management processes that IT organizations are beginning to implement. If EMC can execute on its vision technically, and EMA has every reason to believe it will, EMC Ionix should be a positive force for market disruption and innovation in the coming years. EMC customers will benefit from the flexibility of choice and the impact of advanced discovery, analytics, and automation capabilities applied strategically to their most critical concerns.

To optimize the potential of Ionix, however, EMC will have to address three challenges. The first is the need for growing its application performance management partnerships and capabilities. The second is the need to continue to enhance and expand its services, including consulting services, so that linkages between technology, process changes, and organizational maturity can be more

proactively supported. And the third is the need to invest more heavily in marketing for visibility and recognition in a crowded and confused enterprise management landscape.

EMC certainly has the resources to address all of the above. Whether it does so fully given its historical focus as a storage hardware company is a question of culture rather than sheer capability. However, EMC has a striking and rare opportunity with EMC Ionix to significantly impact the broader management landscape. And as such, EMC customers and the industry as a whole should pay close attention to EMC's progress as it evolves the Ionix portfolio towards a truly next-generation management model.

About EMC

EMC Corporation (NYSE: EMC) is the world's leading developer and provider of information infrastructure technology and solutions that enable organizations of all sizes to transform the way they compete and create value from their information. Information about EMC's products and services can be found at www.EMC.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](#).

This report in whole or in part may not be duplicated, reproduced, stored in a retrieval system or retransmitted without prior written permission of Enterprise Management Associates, Inc. All opinions and estimates herein constitute our judgement as of this date and are subject to change without notice. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. “EMA” and “Enterprise Management Associates” are trademarks of Enterprise Management Associates, Inc. in the United States and other countries.

©2009 Enterprise Management Associates, Inc. All Rights Reserved. EMA™, ENTERPRISE MANAGEMENT ASSOCIATES®, and the mobius symbol are registered trademarks or common-law trademarks of Enterprise Management Associates, Inc.

Corporate Headquarters:
5777 Central Avenue, Suite 105
Boulder, CO 80301
Phone: +1 303.543.9500
Fax: +1 303.543.7687
www.enterprisemanagement.com



1914.070709