

EMC Corporation

Challenge

- Replacing multiple legacy management tools with new processes and tools to support unified and automated IT management a key enabler of private cloud
- Managing the transition to new processes and tools with minimal disruption to the business

Solution

- EMC Consulting and EMC Ionix Professional Services
- EMC Ionix and VMware automated management solutions

Key benefits

- A new Service Catalog that provides the framework for EMC IT to link costs to services to facilitate more informed choices about IT expenditures
- The ability to deliver IT as a service and set up and enforce change management through a single, organization-wide configuration management database and change management process
- A Command Center designed to remove barriers between traditional IT service towers and unify tools and processes for simplified management

EMC IT: unifying and automating management for private cloud

EMC Corporation 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.

EMC IT, the company's internal information technology organization, supports some 40,000 internal users in 61 countries and in 20 languages. It is responsible for the availability and performance of thousands of server instances, thousands of terabytes of storage, tens of thousands of devices, and hundreds of thousands of network ports worldwide.

Journey to private cloud

As EMC's IT organization manages the global information infrastructure that delivers critical applications across product engineering, manufacturing, finance, marketing, sales, and service, it is working to become an even more strategic and cost-effective partner to the business. To reduce costs and transform IT services for greater business innovation and competitive advantage, EMC IT has embarked on a "journey to private cloud".

Because many of EMC's customers are undertaking similar IT initiatives, EMC IT is openly sharing its journey as it moves from a physical to virtual IT infrastructure, and, ultimately, to private cloud.

"As EMC's first and best customer, we can act as a real-life laboratory for applying—and improving—EMC expertise, technologies, and services," says Jon Peirce, VP EMC IT Infrastructure and Services. "EMC expects our products and services to deliver value to our customers; when we prove that through our internal deployments, we can offer solutions that are EMC Proven™."

Building on aggressive infrastructure consolidation efforts of the past, EMC IT has already achieved considerable data center virtualization. For example, today it relies on just two highly consolidated tiered SANs per data center—one for mission-critical environments and one for business-important environments. Similarly, it has created two large VMware® vSphere™ clusters in each data center and is on-track for completing virtualization of its entire Intel-based server footprint with vSphere as the data center operating system in 2010.

As a result of these and other efforts, EMC IT has been able to reduce its IT infrastructure operational expenditure (OPEX), measured as a percentage of sales, by 20 basis points over the past four years. These are cost-savings that have gone back to the CFO for reinvestment in the growth of EMC's business.

Simplifying management

One of the biggest challenges facing EMC IT—or any IT organization with a virtualized infrastructure—is the need for new kinds of management processes and tools.

"Virtualized and pooled architectures need to be monitored and managed differently than traditional IT," says Peirce. "Effective, automated IT services management is even more essential now than it was in the old physical world."

To help unify and automate IT management, EMC IT is replacing multiple legacy monitoring, alerting, configuration, incident, event, and other management tools with EMC Ionix® and VMware automated management solutions. Eventually it plans to enable business provisioning of IT services and solutions via a self-service portal based on VMware's vCloud™ solution.

While new automated management technology is a critical enabler of private cloud, making the transition from today's technology-centered silos and legacy tools to unified IT service management will also have a considerable impact on governance, policy, process, culture, and organizational structures.

Some of the questions raised by the move from physical to virtual include:

- How do policies and processes developed for configuration, change, capacity, and incident management need to change to manage virtual resources?
- What new steps are required when provisioning in the virtual environment?
- How does virtualization affect disaster recovery strategy and failover?
- What new activities and areas of focus are required for monitoring, alerting, and reporting to ensure capacity, performance, and availability?
- How do roles and responsibilities for system, storage, network, and security administration need to change to manage and support new converged technology platforms—for example, new Vblock Infrastructure Packages offered by the Virtual Computing Environment coalition of Cisco, VMware and EMC, which combine virtualization, networking, computing, storage, and security technologies in one virtual building block?
- Can accounting and other financial systems designed for the world of physical assets work effectively in the virtual world?
- Where does an organization start, and how does it manage the transition to new processes and tools without disrupting the business?

EMC IT, understanding that moving to private cloud was a journey, knew it also needed to be able to realize incremental return on its efforts and investments along the way.

EMC Consulting provides the answers

To help answer these questions and accelerate the move to more unified and automated IT services management, EMC IT engaged EMC Consulting.

“We knew we had to define our processes first and then automate them with tools, rather than trying to fit our processes to the technology,” says Stephen LaCross, director, IT Business Operations. “Using EMC's own consulting services had obvious advantages, but it was critical that the IT organization get the most expert guidance it could. We did our due diligence, also getting proposals from other consulting companies that we have worked with in the past. In the end, we decided to rely on EMC Consulting because we needed to go beyond generic Information Technology Infrastructure Library (ITIL) guidelines. We needed to get very tactical, adapting theory to actionable IT best-practices to fit our business, and then automating those ITIL-based processes in next-generation tools like the EMC Ionix IT services management suite.”

Delivering IT as a service

EMC Consulting began working with EMC IT executives and process owners in a series of meetings and workshops. They identified internal process owners as well as an internal program manager who, along with a consulting program manager, would oversee all workstreams and report to the executives.

The project team compared “as-is” and “to-be” capabilities, and considered how “business of IT” principles would guide process definition and provide ongoing governance as processes and operations were automated to improve services and reduce costs.

“In the past, all of the things we had worked on had been focused on improving specific service silos or implementing specific point solutions,” says Norm Simmonds, IT principal business consultant. “The EMC consultants helped us knit together one set of requirements across the different groups in the organization. We gained a high level view of everything we did within a single context: delivering end services to the business.”

Together EMC IT and EMC Consulting identified four initial interdependent workstreams that would help the organization improve services to the business, cut costs, and lay a foundation for private cloud:

- Create a Service Catalog that defined the services IT delivered to EMC businesses
- Link costs to services to provide greater cost transparency
- Consolidate configuration information in one database, with visibility into all of the components required to deliver IT as a service and institute and enforce rigorous change management
- Centralize operational run support and remove barriers between traditional IT service towers

Creating a Service Catalog

As the first step in becoming a more integrated and automated service delivery organization, the team set out to create a Service Catalog that formally defined the services that IT was providing to the business, including service level objectives (SLOs) for performance and availability.

“We had never had a formal Service Catalog for our customers—EMC’s business users,” says Helen Smith, IT principal business consultant. “It was quite a cultural shift for people to start thinking about what they do in terms of service delivered to an end customer.”

Definition of service would drive all other IT service management workstreams, for example, a configuration management database linking infrastructure components to services; policies and procedures for change, incident, problem, request, and event management; tool selection; and the workflow and process activities automated in new tools.

At the outset, the intention was to create a Service Catalog for 100 percent of EMC IT’s services. However, that scope proved too ambitious as an initial undertaking. Instead, EMC consultants concentrated first on identifying and cataloging the business technology and end user computing services that returned 90 percent of business case benefits.

The EMC consultants interviewed service owners and users to define each of the selected services by audience, owner, offerings, service level objectives, cost information, activities, and more. One of the biggest challenges was persuading people, with much of this information in their heads and many demands on their time, to participate.

“The consultants were very persistent and conscientious in driving the process for developing the Service Catalog, and very effective in communicating to people what its benefits would be,” says Smith. “The way they framed questions started people thinking in new ways.”

The consultants used and adapted Service Catalog development methodologies and templates created by EMC Consulting, based on best practices gleaned from engagements with many companies, to conduct structured interviews and construct the Service Catalog.

“In a very short period of time, the consultants took us from a point where we had no services defined and information in many different places, to the creation of a Service Catalog that provides across-the-organization visibility into the services we deliver,” states Smith. “The result has been a real mind shift. People are really starting to see the things they do from the end service perspective.”

The EMC IT team has now taken over cataloging the remaining services themselves, using methods that the consultants have helped institutionalize. The team has also begun working with EMC Ionix Professional Services to implement the Catalog with Ionix for Service Management software. The next step is publishing a business-facing catalog linked to the technology Service Catalog that extends visibility to business owners and users.

From Catalog to cost transparency

The new Service Catalog provides the framework for EMC IT to link costs to services, so that both businesses and IT can make more informed choices about IT expenditures. Such a linkage would also provide the foundation for the development of a provisioning portal for service requests, as well as charge-back to the business based on actual IT consumption.

EMC IT Finance took the services defined in the internal Service Catalog and began working with the IT Operations consultants on ways to make the costs of those IT services more transparent—to influence business decisions and reduce corporate costs.

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**Jon Peirce
VP EMC IT Infrastructure and Services**

One big challenge was the limitation in the organization’s existing accounting and financial systems, which budgeted and tracked IT expenditures by major categories such as people (internal staff and external contractors), maintenance, telecommunications, and so on.

“Our existing systems show us our big ‘spend buckets’,” says Paulo Prazeres, EMC IT director of Finance, “However, they were not designed to show the correlation between costs and services delivered.”

EMC IT Finance worked with EMC Consulting to develop a new model for linking IT services, including application design, development, and support costs, to end services.

“EMC Consulting helped us build a manual cost linkage model that got us out of the gate, so we could begin to see what it would mean to pursue a more system-driven solution,” says Prazeres. “It was extremely helpful to work with an experienced practitioner who had managed his own IT shop, had worked with other companies on similar issues, and who brought a real understanding of the business, technical, and financial issues.”

Working with the consultants, EMC Finance went through a number of iterations, cuts, and revisions to develop a working, Microsoft® Excel-based model that tied costs back to the catalog services.

“We have a nice stacked bar chart of the services, striped by discretionary and non-discretionary costs, as well as how much cost is associated with each service out of which budget,” says Prazeres.

A new insight yielded by the work done to date has been a better understanding of what portion of IT spend is discretionary—in the sense that businesses have the flexibility to change their consumption habits to lower their charge-back costs. For example, when a business budgets for a new hire, the required infrastructure and services, such as messaging, security, support, and so on, are fairly fixed.

“We are now able to show if a business decides to invest so much on new business applications and projects, it will drive this much in relatively fixed costs from an IT infrastructure and service delivery standpoint,” says Prazeres.

The IT organization also gained a better understanding of the investment required to move to an automated charge-back system.

“Our current accounting systems do not support the kind of reporting we would need,” explains Prazeres. “We have looked at new financial software and the other costs involved in moving forward. The next step is to decide: how far do we want to take our service-linked cost transparency; do we want to change our accounting and financial systems; and do we want to make that investment now?”

The work done to link costs to services is already proving valuable as input to budgetary process discussions and infrastructure investment decisions.

“We can show the CFO what we have control over and what don’t we have control over,” says Prazeres. “Now we can show what the impact of business-driven IT decisions will be on infrastructure and operations.”

Unified configuration and change management across the organization

The new Service Catalog has also enabled development of a single, organization-wide configuration management database (CMDB) and change management process. The ability to maintain and access one source of accurate, up-to-date configuration information across the organization is critical step on the journey to private cloud.

“Once you build a Service Catalog, you can implement a CMDB and put in best-practice change management,” says Simmonds, who led this effort. “With a CMDB, you can see all of the components that deliver a service—infrastructure, applications—and how they relate to each other. This visibility then becomes the cornerstone for other service management processes, such as event management.”

The first challenge EMC IT faced in building a single CMDB was how to consolidate the inventory information maintained in a dozen different asset and configuration databases or “systems of record”, to unify visibility into its changing mix of physical and virtual IT assets.

By leveraging the federated CMDB capabilities of the Ionix suite of service management software, EMC IT was able to leave its existing systems of record in place and use the software to rationalize and consolidate the multiple source records to provide a single, complete picture of the infrastructure. This capability eliminated the need for individual teams to have to learn a new tool or use two tools to maintain information in two places—which removed the additional effort required of an already busy staff, as well as reduced the risk of errors and discrepancies.

Governing how the environment may be changed is as important as gaining a unified and accurate view of all the components and how they work together to deliver services. Over the years, the organization's change management process had become very convoluted and difficult-to-follow. In line with ITIL guidelines, EMC IT had already established a Change Advisory Board (CAB) to review and approve changes before they were made to the environment. In practice, however, many changes were made in an uncoordinated fashion in silos throughout the organization, and the CAB was notified only after the fact.

EMC Consulting worked with the team to simplify and strengthen change management and implement controls by defining processes that could then be incorporated into Ionix software. The new processes were built to ITIL v3 standards and the consultants also provided the organization with run books for New Request Fulfillment and New Event Management processes.

The end-to-end consulting expertise, tactical tools, and program management helped EMC IT eliminate the gaps that often occur between consulting, workflow definition, and tool automation.

“The consultants documented process activities so that the Ionix technology experts could pick up the document and understand how to build the workflows in the tool,” says Simmonds.

Today, EMC IT has completed integration of the new processes with EMC Ionix Server Configuration Manager (SCM), Ionix Service Manager, and Ionix for IT Operations Intelligence to monitor servers and track configuration changes with a single integrated system.

“With the guidance and help of our consulting partners, we have been able to define and implement a change management process so that now the CAB must review and approve all changes prior to the change being made in the environment,” says Simmonds. “With Ionix for Service Management monitoring and event management software integrated in its operational support organization, EMC IT will be able to link outages to changes for event correlation to reduce future incidents. If we see a problem with a certain component, we'll be able to see all the configurations and services it impacts and get very proactive.”

The EMC IT Command Center: “window to the private cloud”

To better support the virtualized, converged, and pooled infrastructure of private cloud, EMC IT has also centralized its operational run support all under “one roof”.

“We envision the Command Center becoming the ‘window to the private cloud’,” says Mike Leach, director IT Support Services. “You need one place to see the clouds’ automation, changes, performance, and overall health.”

EMC IT was already providing 24/7 support for the company's network and security operations through two centers in Westborough, Massachusetts and Bangalore, India, when it decided to pull in its storage, data center, systems, messaging, and other teams to create two centralized, cross-domain Command Centers.

“Today our number one goal is to restore services,” says Leach. “With the help of EMC's Ionix product suite, we are working towards preventing service interruptions before they impact our business.”

EMC Consulting worked with Leach and his team to fully document the “as-is” support across the existing towers. The consultants captured existing workflow, processes, tools, organizational structure, current team members, users/customers, vendor relationships, and more.

“Having the ‘as-is’ was extremely important in moving service tower personnel and support to the Command Center without disruption to the business,” says Leach. “Knowing exactly what you have is also a pre-requisite for making any improvements.”

“EMC Consulting validated processes against ITIL and other best practices, but also adapted these to fit our business. They established metrics so that we can see the benefits we’re getting out of our investments as we move up the service management maturity curve. Perhaps most importantly, they designed projects to deliver incremental payback, so we can realize value from the investments we’re making along the way on our journey to private cloud”

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The “as-is” documentation proved critical for aligning teams and reducing redundancy among the existing groups, while still being aware of service requirements and commitments. For example, it became clear that nine groups were maintaining their own 24/7 monitoring and escalation teams. By understanding the “as-is” state of service delivery, it was possible to see how to consolidate these teams—without disrupting or lowering the quality of service.

Consultants also worked with all of the existing operational support teams (network, security, management and surveillance tools, event coordination, messaging and collaboration services, access management, technical analysts, systems, production control, and storage) to develop a unified Command Center mission and vision.

“This was significant cultural change,” explains Leach. “People felt strongly that they were a part of the storage or messaging team. It was essential that the consultants we brought in had credibility. People would test the so-called experts we had brought in during the first few meetings. The EMC Consulting IT Operations consultants passed these litmus tests. We are now ‘live’ with all our services, and all our staffing is done.”

Most of the personnel for the Westborough Command Center were from legacy service tower groups, with about 20 percent of the Bangalore Command Center hired from existing groups. The rest were new hires.

The organization is now working on making the transition to a “single pane of glass” view.

“Quite frankly, many events and alerts still go directly to individual engineer cell phones and pagers,” says Leach. “We’re bringing governance to tools so that all tools feed into one window of availability for the application or service that our end users need to do their jobs. That’s a transformation, both culturally and process-wise, that we’re still working on.”

The team hopes to use new reporting tools to collect information on when and why support issues require support from architecture, design, and implementation specialists outside the Command Center.

“Is it because we don’t have the staff, the training, or access rights?” asks Leach. “We want to do as much as possible in the Command Center to get rid of what I call the ‘operational tax’ on these specialists, so they can get back to doing what they do best.”

The Command Center is also working on gaining new visibility into application availability.

“We have an IRIX window that captures events from our Exchange cluster,” explains Leach. “Out of the thousands of events, we’ve identified five or six ‘red alerts’ that tell us there will be a problem, and we have given that visibility to our Command Center and our Service Desk. The team is now expanding ‘red alert’ visibility to other components that could bring down the Exchange service such as the UNIX gateway, e-mail ‘spam’ filtering, storage, and so on. We’re starting with the most mission-critical applications and improving monitoring and visibility for those first.”

As the Command Center continues to unify tools and processes, significant benefits are already being realized from the physical co-location of teams working together, especially on mission-critical problems.

“In the past, Severity-1 issues triggered conference calls among different service tower teams in different locations as they tried to interpret and resolve problems over the conference bridge,” says Leach. “Even though we don’t yet fully have a single view into events and tools, having people in one physical location with the ability to get up and look at a screen over the shoulder of a colleague is making a huge difference.”

A successful transformation

For EMC IT, and for any other IT organization, the transition to integrated service management and new automated management systems to enable private cloud is a massive undertaking. Determining the initial scope, and finding ways to realize and measure incremental return on investment along the way, are critical to success.

“IT organizations are right to be wary of large transformative undertakings,” says Peirce. “Taking on too much at once is self-defeating. Yet approaching pieces in a serial way takes too long. Our philosophy is to try to get through as much as possible, as quickly as possible, to get to the ROI. To that end, it has been extremely helpful to be able to test the practicality of our objectives against the experience of people who have implemented some of these things in other businesses—as well as to have their guidance in designing parallel workstreams.”

In this engagement, EMC Consulting has helped accelerate service management and operational automation efforts in many ways.

“EMC Consulting validated processes against ITIL and other best practices, but also adapted these to fit our business,” says Pierce. “They established metrics so that we can see the benefits we’re getting out of our investments as we move up the service management maturity curve. Perhaps most importantly, they designed projects to deliver incremental payback, so we can realize value from the investments we’re making along the way on our journey to private cloud.”



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