EMC Perspective

EMC² where information lives®

Automating ITIL Process Execution

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Abstract

This paper describes how EMC® automation software solutions can deliver significant value and benefits when supporting IT Infrastructure Library (more commonly known as ITIL®) processes and IT service management (ITSM) initiatives related to incident management, problem management, configuration management, and change management.

Executive Summary

All ITIL processes can benefit (either directly or indirectly) from the application of EMC automation technologies. However, incident, problem, configuration, and change management represent current focal points for EMC. How EMC resource management solutions address and support these processes is detailed in this paper's sections on each of these disciplines.

And although all ITIL processes can benefit from the application of EMC automation solutions, that does not mean that any one product from EMC—or any other vendor—will fulfill every requirement for each process you want to improve. EMC automated management products work in conjunction with other tools, many from other vendors, to strengthen the overall effectiveness of each process. We choose to leverage our strengths to deliver the optimum capability and simplicity for process automation. As EMC and customer needs evolve, we will expand this set of automation capabilities—through internal development, partnerships, acquisitions, or a combination thereof—to meet customer needs.

Introduction: Taking a Process Focus

When investigating products and offerings for improving process management and supporting ITSM initiatives, you need to be realistic. Software vendors do not "sell" ITIL. However, they do offer automation solutions that can accelerate and enforce an ITIL implementation. Many vendors, including EMC, also offer professional services—in the form of training, consulting, assessments, and advice—to assist those who need help starting, enhancing, or evolving ITIL and ITSM initiatives.

No software vendor has all the tools you need. Each company chooses to focus on its specific strengths, and may look to partners to fill the gaps in areas in which they choose not to compete directly.

EMC's Process Focus

EMC takes such an approach to its support of ITIL—that is, directly offering solutions built on its key strengths, while leveraging the skills and products of leading partners to support other ITIL capabilities.

EMC's automation solutions from the EMC Smarts® family of products support ITSM initiatives and offer significant benefits when applied to the following ITIL processes (see Figure 1):

- Incident management
- Problem management
- Configuration management
- Change management

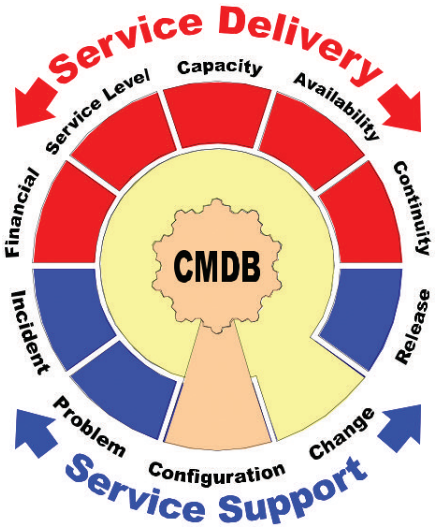

Figure 1. Core ITIL Processes

Although all ITIL processes benefit from these technologies (either directly or indirectly), incident, problem, configuration, and change management represent current focal points for EMC. And even though all ITIL processes can benefit from the application of EMC automation solutions, that does not mean that any one product from EMC—or any other vendor, for that matter—will fulfill every requirement for each process you want to improve. EMC's automated management products work in conjunction with other tools, many from other vendors, to strengthen the overall effectiveness of each process.

By focusing on these specific processes, EMC is realistic and open about its intentions. We choose to leverage our strengths to deliver the optimum capability and simplicity for process automation. As EMC and customer needs evolve, we will expand this set of automation capabilities—through internal development, partnerships, acquisitions, or a combination thereof—to meet customer needs.

The following sections provide more detail on how EMC's automation solutions support incident, problem, configuration, and change management.

Incident Management

Incident management has always represented a traditional strength of Smarts technologies—even prior to their acquisition by EMC in 2005. Many people, even some ITIL evangelists, view incident management as the sole domain of service desk (help desk) solutions. Although a service desk undeniably remains core to the entire process, an acute need exists for automation in the early stages of the process.

We call this early phase triage, and it incorporates two basic functions: isolating the root cause of the incident, and prioritizing incidents for escalation (see Figure 2). Inefficiency within incident triage remains a significant challenge to most IT operations teams.

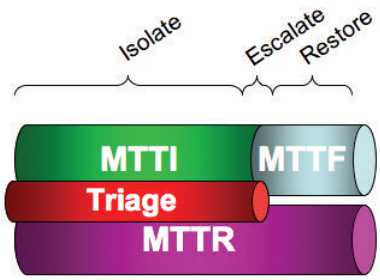

Figure 2. Incident Triage

One common key metric—mean time to resolution (MTTR)—is often used as a proxy for the effectiveness of IT operations. MTTR is composed of two main elements:

- Mean time to isolation (MTTI)—that is, how long it takes to find the true root cause of the incident
- Mean time to fix (MTTF)—that is, how long it takes to repair the root cause of the incident

Root-cause isolation is performed during MTTI. Once the root cause of the incident is determined, resolution of the incident can be escalated—most likely through service-desk automation—and the appropriate IT operations expert dispatched to make the actual repair.

Triage encapsulates isolation and escalation. The inefficiencies in triage exist because MTTI consumes far more time and energy than it should. IT operations teams tend to isolate incidents through tribal knowledge (where it exists), or, more frequently, through a chaotic series of events characterized by emergency meetings, finger pointing among domain experts, and little actual information to guide decisions. Although this haphazard, reaction mode to incident management is far too common, most of the chaos can be eliminated through solid process management and automated triage.

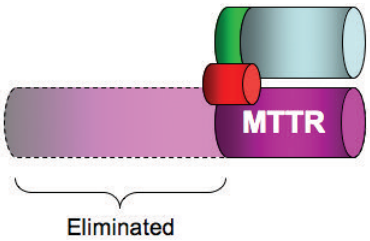

Figure 3. Automated Triage

In most typical situations, IT research estimates that MTTI represents an overwhelming 70 percent to 80 percent of MTTR time. Given MTTI's disproportionate impact on MTTR using manual processes, automated triage can reduce MTTR dramatically. And since MTTR-related work represents a significant proportion of overall IT costs, applying the power of automation to triage to effectively eliminate MTTI translates into serious operational cost savings.

However, the automation of root-cause isolation needs to be approached properly. Root-cause isolation has long been a goal for management technology users and vendors. The dream of identifying the root cause of a cross-domain service incident, and even within isolated technology domains, has been elusive for most of these tools. This general failure is due to the arcane design of these tools.

The award-winning automated analysis from EMC Smarts embodies this new approach. Based on the EMC Common Information Model™ (ECIM) and the patented Codebook Correlation™ engine, EMC's model-based approach offers the optimum ability to identify the root cause of an incident.

Other management solutions rely on rules, which cannot adapt to the dynamic technologies—and the dynamic rate of change—increasingly common in IT environments. As more virtual infrastructures and service-oriented architectures are deployed, IT services will morph more frequently, rendering antiquated rules-based analysis technologies useless.

By accurately identifying the cause of the incident, we can avoid misdirected resolutions. It is painfully too common for the service desk to escalate a trouble ticket to the wrong responder because the information to guide these decisions is weak or missing. The model-based automation in EMC solutions is more effective because this critical information is inherent in the software's discovery. Even where the information is more difficult to discover (e.g., deep application detail), EMC software can identify the correct domain (e.g., network, storage, server, application). We can eliminate situations where the wrong domain is dispatched, which is particularly frustrating for incidents requiring midnight wake-up calls. EMC automation enables dispatching to the right person the first time.

Incidents can also be prioritized through EMC Smarts Business Impact Manager (BIM). When an infrastructure event occurs, its effect on business services may be minimal, devastating, or somewhere in between. BIM calculates this impact, thus prioritizing escalation. For example, if two servers are suffering from adverse conditions, which should get the attention first? One may be a print server whereas the other is supporting a business-critical application. There is an obvious difference in importance here. Also, redundant infrastructure (e.g., load-balanced servers) is designed to allow infrastructure failures with no real business impact. If the impact is minimal, regardless of the service supported by this infrastructure, priority is lower. The only way to effectively and quickly determine these situations is through automated prioritization and escalation such as that offered by EMC solutions.

Problem Management

Although closely related to incident management, problem management has less of a sense of urgency than incident management (whose aim is to restore an IT service as soon as possible). However, one aspect similar to both processes is the need to determine root cause. The exact same EMC Smarts analysis that automates incident triage is also valuable in streamlining root-cause identification in problem management.

Problem management also utilizes historical logs of incidents to identify problem patterns over time. To be effective, problem management requires accurate incident information. In most instances, incident logs are tainted with false alarms and spurious events that impede the ability to extract problem patterns. Since the EMC Smarts analysis produces well-qualified incidents—instead of false alarms—it essentially pre-filters the incident log and enables IT operations to make more efficient problem management decisions.

Configuration Management

Configuration management represents the most pivotal of all ITIL operational processes. If designed, implemented and maintained properly, configuration management can function as an incredibly powerful fulcrum for success. Of course, the inverse is also true—that is, poor configuration management will hamper all other ITIL processes and ITSM initiatives.

One of the factors most critical to the success of configuration management is accurately maintaining the configuration management database (CMDB). Many CMDBs fail because the IT organization updates information manually, places quixotic hope in the change management process as the sole means to maintain CMDB accuracy—or both. Such naïve approaches do not work because:

- People are notoriously poor at repetitive, manual tasks.
- Even a strong change management process cannot prevent the information from becoming stale.
- Configuration changes occur too often to allow manual updates.

The population of the CMDB must be automated using good discovery technologies for all infrastructure and application domains—and, eventually, for business services and business processes as well.

Although discovery—especially infrastructure discovery—is a common capability among management tools use of best-in-class discovery will yield tremendous benefits to IT operations. Discovery technologies need to fit the individual domains—such as network, storage, server, and the complex realm of applications—in which they will be used. When choosing discovery technologies, you should consider the two aspects of discovery that make a critical difference: relationships and behavior.

Many discovery tools merely collect objects into a repository. Although possessing such an inventory is valuable, the relationships that exist among the objects produce the meaningful abstractions necessary to properly leverage the overall configuration of IT services. Without information about relationships, the CMDB is nothing more than an unassembled jigsaw puzzle—scrambled and meaningless. Only when you arrange and connect these jigsaw pieces can you create something meaningful. This is the function of relationships. They bind the elements into something useful for ITSM.

Relationships are multidimensional. Examples include:

- Physical (such as how a network cable connects a router and switch)
- Logical (such as how an application server interacts with an database server)
- Organizational (such as how a server supports order entry)

In all cases, the elements are the same. By arranging them in different ways with different relationships, the aggregations can be radically diverse for various purposes (for example, incident analysis or capacity planning).

EMC offers several discovery technologies for configuration management that can deliver comprehensive coverage of your information infrastructure. More importantly, all of these technologies map the relationships that are mandatory for advanced process automation. These EMC Resource Management technologies come from two related product families:

- EMC ControlCenter® family—Industry-leading storage resource management for heterogeneous direct-attached, SAN, and NAS storage infrastructure. ControlCenter and related storage resource management products are the de facto standards in the majority of global enterprises.
- EMC Smarts family:
  - Network discovery, monitoring, and analysis products that irreversibly altered market discussions around network management. Smarts discovery includes a wide variety of physical and logical network connectivity (such as link layer, IP, MPLS, routing, and IPv6), and network services (such as VoIP and IPTV).
  - Application Discovery Manager—This award-winning appliance for application dependency mapping and deep configuration discovery for servers and applications represents a key element of EMC's rapidly evolving technology solutions for CMDB and configuration management. The uniquely rich and timely discovery capabilities in Application Discovery Manager offer the only hybrid of agentless active and true passive discovery. Its federation and reconciliation engines allows the IT operation to create the distributed, multivendor CMDB it needs to support ITIL and ITSM initiatives.

At the core of all of these EMC products is the flexible ECIM. This object model captures a description of the real world in software, and reflects multiple dimensions of infrastructure, applications, and business services, (including topological and behavioral characteristics). ECIM need not reside in a single physical structure, or even on the same server. It can be split into many physical entities while maintaining its unified logical structure.

Based on and able to integrate with the Common Information Model (CIM) standard developed by the Distributed Management Task Force (DMTF), ECIM also adds important extensions. EMC is committed to continued standards development. In March 2007, EMC, Microsoft, and Cisco Systems jointly announced the next generation in this evolution with the Service Modeling Language (SML) definition that is based heavily on the innovations of ECIM modeling.

EMC will continually evolve its automated discovery and configuration management capabilities. The robust discovery technologies currently in the EMC portfolio represent the foundation for aggressive, ambitious, but attainable plans for supporting and enhancing CMDBs, configuration management, and broader ITSM.

Change Management

Since EMC captures accurate configuration details—many in real time—the same technologies can identify changes as well as generate detailed events regarding these changes. When queried about IT service failures, every seasoned IT operations professional will first ask, "what changed?"

Independent research confirms this—more than 80 percent of all service affecting incidents result from erroneous changes. The same research estimates an astounding 30,000 changes occur daily in the average IT organization. These numbers highlight the need for diligent action and obviously, automation.

Although automated change detection and analysis are keys to change management, they also indicate a primary process integration between change and incident management. A change is an event that may be the root cause of a service failure. One cannot know for certain until after analyzing the change in the context of the applications and IT services impacted. This function is the responsibility of the incident management process and its requisite automation.

Another important role EMC technologies serve in supporting change management is to provide trustworthy information to drive change decisions. All changes—especially significant changes—require automated change validation tests prior to execution. Testing helps ensure the change is sensible—and prevents unwelcome surprises after execution. These tests may:

- Indicate potential adverse effects of the change
- Drive decisions to:
  - Postpone or cancel the change
  - Implement other remedial action to prevent adverse effects

The relationships and behavioral aspects of the EMC model and CMDB elements enable impact assessment by navigating the "map" among information infrastructure elements, applications, business services, and users. These abstraction layers are all linked. EMC products already automate some of this assessment, with work continuing on enhancing and improving these capabilities.

Conclusion: Realistic Tool Integration

Like everything related to ITIL, IT operations need to phase in improvements derived from implementation of ITIL best practices—as well as improvements to the management infrastructure that will make ITIL deployments effective. As it looks to make these continuous improvements, IT operations should not turn its back on investments already made in systems (as well as the skills and training of the operators of these systems)—doing so would lose the leverage associated with these investments. IT operations should also incorporate into this overall process automation puzzle other third-party management tools (such as server agents, application monitors, and database tools).

For example, EMC Smarts technologies automate the discovering and monitoring of the information infrastructure, including the cross-domain relationships and dependencies that exist across networks, storage, applications, servers, and operating environments. It automates the identification of root-cause incidents, and provides this critical information to the appropriate IT operations teams. If the organization is using one of many supported help desk systems, EMC Smarts can integrate with these widely deployed systems and automatically create, track, and close trouble tickets.

Without tight and simple tool integration, full process automation is impossible. Although EMC is streamlining as much of this integration as possible, ensuring and developing integration skills in-house remains a prudent decision. Integration will remain a gap in the IT industry for years to come. Although leading vendors are working hard to improve integration, most will be slow to offer tight and simple tool integration. EMC will lead the charge for integration.

Emerging EMC process automation solutions demonstrate this commitment to simplicity. Several new and exciting solutions are scheduled for release during the next two years—some will be announced soon after publication of this white paper. Because the value EMC can deliver to customers depends heavily on this vision for process automation, EMC will

continue to make significant investments in research and development, marketing, partnerships, and acquisitions. EMC is truly a strong and trustworthy partner to enable significant improvements in IT service quality and IT service management—now and in the future.

References

For more information on why IT operational excellence requires unifying process and technology—as well as practical, well-qualified guidance on successful process management—see the EMC Perspective titled *Pragmatic ITIL Process Automation*.

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Published in the USA. 07/07

EMC Perspective
S0083