IN THIS WHITE PAPER

This IDC White Paper analyzes the evolving market for workload scheduling and automation software. It identifies the capabilities and value of workload automation solutions in terms of underlying business needs and IT drivers, as seen from a high-level benefits-oriented perspective. The paper also identifies and describes the ongoing trend toward convergence of traditional job scheduling functions with other forms of server/workload automation to form the workload scheduling and automation software functional market. The Control-M workload automation solution from BMC Software is analyzed with respect to key functional capabilities and benefits to customers.

KEY BUSINESS CONCERNS

Despite the gradual economic recovery, IT organizations continue to struggle with the conflicting demands of cost containment versus improving services to end users. The continued cautious economic outlook reinforces the pressure on IT organizations to achieve efficiencies and operational cost savings. Ongoing IDC surveys and interviews with IT managers, professional staff, and end users provide insights into key IT pain points and priorities. Today, typical IT business concerns include the following:

- Containing costs — both capex and opex
- Improving customer satisfaction
- Improving service quality and accuracy
- Increasing revenue
- Speeding time to market — agility
- Increasing market share

IT organizations must provide effective and responsive support to the business and other organizational units by operating key applications with high service quality, especially application and database performance and availability. At the same time, IT must operate efficiently to contain costs. These pressures drive the need to optimize the use of IT infrastructure and the need to streamline, standardize, and automate key processes.
GROWING IT AND WORKLOAD COMPLEXITY

IT infrastructure continues to grow in scale and become ever more complex, making the task of achieving desired service levels even more difficult. Today’s highly competitive business environments demand fast, reliable Web and mobile access to IT-based applications to deliver critical services to customers, employees, and end users. Applications are increasingly being directly accessed by end users using a variety of wireless, portable, and handheld devices.

Workload complexity is also increasing, posing even more operational challenges for IT organizations trying to keep up with business service demands. Key factors driving up complexity include workloads:

- Consisting of multtier applications or componentized applications
- Spanning multiple platforms, both mainframe and distributed
- Processing real-time events and triggers
- Accessed directly by end users, often with mobile devices
- Running in virtualized environments
- Running in cloud environments
- Running in dynamic environments — motion, elasticity
- Driven by self-service requirements
- Implementing complex business processes
- Implementing complex IT processes: runbook, provisioning

Despite IT and workload complexity, IT organizations are under increasing pressure to provide high service quality in terms of availability, performance, reliability, and flexibility to meet changing requirements for critical business applications under widely varying operating conditions while still containing costs.

AUTOMATION STRATEGY

A key strategy for achieving these objectives is automation of key workload scheduling and operations functions. IT departments often employ a variety of methods and tools to automate the operational management of jobs and workloads. Traditional scheduling software products typically focus on running batches of jobs to meet specific time schedules — such as an overnight batch window — or calendar-based requirements. Individual jobs such as inquiries and updates to databases can be independent of one another or can be related components of a larger workflow or even an entire business process. In such cases, workload management software must handle job-to-job transitions and file transfers as part of a defined workflow. In recent years, job scheduling software has evolved and been extended to include distributed, cross-platform and event-driven operations and to provide support for real-time and online applications.
The deployment of increasingly complex IT infrastructures — especially virtualization and cloud — and the need to support dynamic environments have driven expansion of scheduling functions, often in combination with other workload automation capabilities including workflow and process management, server and image provisioning, and policy-based decision making and orchestration. Such capabilities enable IT departments to create automated processes management capabilities that support today’s critical real-time and online business services.

WORKLOAD SCHEDULING AND AUTOMATION

IDC’s software taxonomy recognizes the evolution of job scheduling software capabilities and the trend toward convergence with other workload automation functions. These capabilities are included in IDC’s workload scheduling and automation software functional market. According to IDC’s Software Taxonomy definition:

- Workload scheduling and automation software manages the provisioning, placement, and execution flow of work on systems as well as the provisioning of images, operating systems, and applications onto physical and virtual servers. The tools bring automation and centralized control to executing the steps contained in IT workloads and processes and infrastructure and application provisioning.

- This category includes traditional calendar-driven schedulers and event-driven schedulers, as well as workflow engines, runbook automation software, self-service portals, and server/application provisioning software. It also includes workload-balancing applications working at the application (rather than system) level. This functional market is specific to IT processes and does not include business process automation. It also does not include workload-balancing applications that work at the system level (e.g., high-availability software).

The worldwide workload scheduling and automation software market is made up of two submarkets — job scheduling and distributed server/workload automation — defined as follows:

- **Job scheduling** includes software tools that manage the flow of workloads and applications on systems using calendar or other fixed-schedule metrics as well as event-driven triggers, such as file events or completion of jobs. This market is limited to tools that work at the application level rather than the system level. It does not include workload-balancing applications that work at the system level (e.g., high-availability software). It encompasses both mainframe and distributed platforms.

- **Distributed server/workload automation** includes software running on distributed, nonmainframe platforms that enables dynamic automated physical and virtual server provisioning, workload and VM allocation and reclamation, self-serve cloud provisioning portals, runbook automation, and workflow orchestration products. Task-level automation capabilities included in software that is primarily focused on asset discovery, software license management, and software distribution are not included here because they are part of the change and configuration management software market. Task-level automation capabilities included in software that is primarily focused on service desk operations are not included here because they are part of the problem management software market.
Workload automation software is an important enabler of a comprehensive cloud management strategy in that it enables consistent, policy-based, centralized control over deploying and executing IT-based workloads and processes, including both calendar-driven and event-driven action sequences.

**MARKET SIZE AND GROWTH**

IDC tracks and forecasts the growth of the worldwide workload scheduling and automation software market and each of the two component submarkets. As illustrated in Figure 1, the workload scheduling and automation software market achieved worldwide revenue of $2.66 billion in 2010 and is forecast to grow to $3.69 billion in 2015, achieving a CAGR of 6.8%. This forecast predicts total market growth of 38.7% over the five-year forecast period.

**FIGURE 1**

*Workload Scheduling and Automation Revenue by Submarket, 2010–2015*

Source: IDC, 2011
As can be seen in Figure 1, the job scheduling submarket is the largest component of the overall market and is growing at a CAGR of 1.2%. The distributed server/workload automation submarket, currently the smaller component, is growing rapidly at a CAGR of 16.7%. Comparative annual growth rates forecast for the two submarkets for 2011–2015 are illustrated in Figure 2.

**FIGURE 2**

*Workload Scheduling and Automation Growth, 2011–2015*

Source: IDC, 2011

**BMC CONTROL-M FOR WORKLOAD AUTOMATION**

BMC Software is a long-standing supplier of job scheduling and workload automation software solutions. BMC Control-M, which is BMC's flagship product for workload automation, integrates the management and operational control of a diverse set of critical scheduling and workload automation functions, across a heterogeneous infrastructure, from a single point of control. Control-M schedules and monitors jobs and processes as they execute, checks status, and shows alerts and exceptions.
Control-M addresses IT needs for workload scheduling and automation of key workloads and business services across a wide range of today's highly complex infrastructure environments, including mainframes, distributed systems, virtualized infrastructures, dynamic event-driven scheduling, image motion, and cloud architectures. Figure 3 shows an overview of Control-M workload automation functions.
Control-M directly addresses the needs of IT organizations to monitor, manage, and control workloads in these environments to ensure that end-user service-level requirements are satisfied and so that IT organizations can gain operational efficiencies by reducing the number of slowdowns, outages, or other service-impacting incidents often caused by operational errors. Given this range of functionality and the need for IT organizations to control operational costs, Control-M is well positioned to benefit from the strong growth trajectory that IDC forecasts for the overall workload scheduling and automation software market, including the more complex market segments that have the highest growth potential.

Figure 4 illustrates Control-M's central console view that can show individual jobs and workflows and can track entire business processes. Control-M can initiate automated actions on exceptions or generate service desk trouble tickets. Control-M enables operators to diagnose failure conditions; take corrective actions such as restarting jobs, changing scripts, or modifying JCL; and track the progress of business processes against service objectives.

**Figure 4**

**BMC Control-M Central Viewpoint and Operational Controls**

Source: BMC, 2012
BMC CONTROL-M SELF SERVICE

With the increasing focus on SaaS and other forms of cloud services, "self-service" access to applications and infrastructure is gaining popularity with IT organizations and end users alike. While self-service is regarded as one of the primary attributes of cloud services, the use and the value of self-service also extend to other forms of IT infrastructure deployments ranging from traditional datacenters to highly virtualized, dynamic environments. Self-service solutions provide an opportunity to economize on the use of IT staff time while also providing improved service delivery.

BMC's Control-M Self Service is an add-on component that provides capabilities for on-demand access to automated workloads — typically those delivering a business service. Control-M Self Service gives IT organizations the opportunity to improve the effectiveness of the IT staff in managing the operation of key workloads, as well as the ability to place more visibility and control in the hands of business organizations and selected end users. BMC's Control-M Self Service delivers a Web-based interface, a service catalog, and facilities to initiate, monitor, or change predefined workloads, enabling a role-based approach to controlling key applications and workloads. Control-M Self Service supports four key roles:

- **Business users** — view and request IT workload services needed to support internal and external customers, without the need for specialized knowledge
- **Workload automation administrators** — make workload automation easier to install and configure
- **IT operations** — offload tasks to empowered users and reduce the number of help desk tickets
- **Service management** — self-service dashboard views of workload operational status and service health that are provided directly to end users

These role-based capabilities can result in significant operational efficiencies, such as reducing the number of service request tickets and reducing the IT staff time needed to perform requested operations.
**BMC CONTROL-M SELF SERVICE MOBILE APP**

BMC has extended the range of Control-M with Control-M Self Service Mobile App, which allows authorized users to access a service view of Control-M from a variety of mobile and handheld devices, including iPads and iPhones. Control-M Self Service Mobile App enables business managers, business users, and IT staff to monitor and track the progress of critical business services and applications wherever wireless service (including WiFi) is available. Initial views can show the status of business services, with drill-down capabilities that can display the status of individual jobs and understand progress against service-level objectives. Such flexible access enhances the ability of IT to provide real-time status and control facilities to business process owners, demonstrating close IT support of business needs. The use of mobile devices to access Control-M Self Service is illustrated in Figure 5.

**FIGURE 5**

BMC Control-M Mobile Access

Source: BMC, 2012

**CONNECTIONS AND INTEGRATIONS**

Control-M has extensive capabilities to schedule, manage, and automate workloads across diverse, heterogeneous infrastructures. These capabilities come from specific connections and integrations with management frameworks, applications, databases, middleware, and specific operating environments. Figure 6 summarizes Control-M support for enterprise management consoles, ERP applications, application-specific files, relational databases, and service-oriented architecture. Control-M integrates
with BMC Software management software, including automation components such as BMC BladeLogic for provisioning and BMC Atrium Orchestrator for runbook automation. Control-M tightly integrates with BMC Remedy Service Desk, helping IT organizations troubleshoot problems before they impact business operations.

**Figure 6**

**BMC Control-M Connections and Integrations**

<table>
<thead>
<tr>
<th>Enterprise Management Consoles</th>
<th>BMC Software</th>
<th>ERP Integration</th>
<th>File Transfer, ETL and Data Integration</th>
<th>Relational Databases</th>
<th>Service Oriented Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC Proactive Net Performance Management</td>
<td>BMC Atrium CMDB</td>
<td>SAP</td>
<td>Cognos</td>
<td>Oracle</td>
<td>Message Queues</td>
</tr>
<tr>
<td>HP OpenView</td>
<td>BMC Atrium Orchestrator</td>
<td>Oracle eBusiness Suite</td>
<td>Informatica</td>
<td>IBM LDB/DB2</td>
<td>Web Services</td>
</tr>
<tr>
<td>IBM Tivoli</td>
<td>BMC BladeLogic</td>
<td>PeopleSoft</td>
<td>SAP Business Objects</td>
<td>MS SQL Server</td>
<td>Java/JEE</td>
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<tr>
<td>CA Unicenter</td>
<td>BMC Remedy</td>
<td>JD Edwards</td>
<td>SAS</td>
<td>Sybase</td>
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<td>Lawson</td>
<td>IBM DataStage</td>
<td>PostgreSQL</td>
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<td>Banner</td>
<td>File Transfer Protocol (FTP)</td>
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<td>SSH File Transfer (SFTP)</td>
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</table>

Source: BMC, 2012

Figure 7 shows the major platforms and operating environments supported by Control-M, including virtualization and cloud platforms such as VMware, Amazon EC2, and BMC’s Cloud Lifecycle Management. Control-M supports a wide variety of distributed and mainframe server environments, including z/OS, Linux, multivendor Unix environments, and Windows, thus providing the basis for managing and automating cross-platform workload operations.

**Figure 7**

**BMC Control-M Operating Environments**

<table>
<thead>
<tr>
<th>Virtualization and Cloud Computing</th>
<th>OS Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMware</td>
<td>z/OS</td>
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<tr>
<td>Amazon EC2</td>
<td>AIX</td>
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<tr>
<td>BMC Cloud Lifecycle Management</td>
<td>Linux</td>
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<td></td>
<td>iSeries/OS/400</td>
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<td>VMS</td>
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<td>Solaris</td>
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<td>HP-UX</td>
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<td>Tru64</td>
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<td></td>
<td>Agentless Scheduling via SSH</td>
</tr>
</tbody>
</table>

Source: BMC, 2012
KEY BENEFITS

The overall goal of workload automation software is to meet business service-level requirements while optimizing the use of infrastructure resources and reducing IT operational costs. The ability to do so across cloud and noncloud environments significantly simplifies IT operational environments and helps IT better align resource consumption choices with business policies and priorities.

Key benefits that can result from the use of Control-M workload automation software include the following:

- Improved service to business — better availability, response, agility
- Better business alignment — provides role-based access to end users, self-service
- Cost savings — tools and server consolidation, infrastructure optimization
- Time savings — reduces operational complexity, optimizes workflows
- Fewer manual processes, frees up staff time
- Fewer incidents/trouble tickets
- Support for major events: mergers and acquisitions, new ERP applications

One area in particular is Control-M's extensive range of application and platform support. This enables the use of Control-M as a solution for consolidating workload scheduling and automation functions across diverse heterogeneous infrastructures. Often, activities such as corporate mergers and acquisitions or server and datacenter consolidations reveal or highlight the existence of disparate toolsets or homegrown solutions, such as scripting, to achieve scheduling and automation functions. These fragmented conditions can result in inefficient use of IT staff time as well as more frequent incidents and even service interruptions.

BMC CONTROL-M CONVERSION SUPPORT

BMC Software has developed a methodology and conversion tool to help IT organizations migrate from their existing scheduling and automation software solutions to Control-M. BMC's conversion methodology includes scoping the conversion effort by analyzing the existing environment and estimating the work needed for conversion. The methodology includes performing required data file conversion, importing the converted data into Control-M, and validating that the converted Control-M solution meets customer scheduling requirements.

The BMC Control-M workload automation solution includes the BMC Control-M Conversion Tool, which is designed to simplify the process for IT organizations to convert existing schedulers to Control-M and perform scheduler consolidation. This interactive conversion tool leads users through the required steps needed for the conversion process, with predefined rules and actions, and performs data conversion for definitions, calendars, and related files for selected third-party schedulers. The converted third-party...
scheduler files generated by the Conversion Tool can be directly imported into BMC Control-M, streamlining and simplifying the overall conversion process.

**CHALLENGES/OPTIMITIES**

Adoption of a comprehensive workload automation strategy can require IT organizations to refine and optimize operational processes to achieve efficiencies. Transition to a more automated approach can impact organizational roles and responsibilities. The challenge for IT organizations and supporting vendors such as BMC is to ensure that the need for and benefits of workload automation are clearly understood and accepted so that adoption can proceed smoothly.

The opportunity for IT organizations is to achieve improvements in business service while saving costs — an imperative in the current economic climate. Vendors must continue to extend and simplify their solutions to encompass ever more diverse infrastructures such as multiple hypervisors and alternative cloud architectures.

**SUMMARY AND CONCLUSION**

The use of workload scheduling and automation software to achieve service improvements and operational efficiencies is showing strong growth, as measured by IDC's market revenue history and forecasts. The case for using these kinds of solutions is strengthened as IT organizations adopt comprehensive virtualized infrastructures and move to cloud-based alternatives. From an organizational perspective, self-service and mobile access to workload automation solutions are well-received approaches to achieving better IT-business alignment. BMC's Self Service/mobile access enhancements provide IT organizations using Control-M with the opportunity to improve service delivery to end users. Given these considerations, BMC's Control-M software is well positioned to provide comprehensive workload automation solutions to IT organizations, especially those with large-scale heterogeneous infrastructures.

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