

## WHITE PAPER

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# Driving Greater IT Efficiency Through Automation

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## IN THIS WHITE PAPER

The key to business survival in today's fast-changing environment is business agility. Now more than ever, organizations have to find ways to adapt and respond quickly to the business environment, while ensuring their existing systems become more efficient, more effective, and less reliant on human intervention. Drawing on the results of a recent Hitachi Asia-sponsored survey, this IDC White Paper outlines some of the key challenges facing today's CIOs and their IT departments, and how job scheduling and workload automation hold the key to unlocking the true value of virtualization and cloud investments. We also offer essential guidance for CIOs and IT managers who are considering adopting job scheduling and workload management to address today's enterprise challenges.

## SITUATION OVERVIEW

It is one of the realities of managing IT that the availability of funding for projects is limited. In spite of greater demands from the business, an ever increasing level of complexity, and the continuous growth in data volumes, IT budgets have either remained stagnant or, in some cases, declined. Yet IT management is expected to continuously upgrade and improve the systems in line with what the business expects and demands. Addressing one of these issues has been the drive towards virtualization of the x86 platform. Initially positioned as a way to consolidate hardware (thereby reducing the capital expenditure needed to procure new systems as well as operating costs due to lower requirements for power, cooling and floor space), virtualization has now become the accepted first step towards being able to deliver a private cloud environment within the datacenter.

As a result of this trend, hardware vendors have moved forward to design what some call converged systems, essentially consolidating servers, storage and networking into a single system to drive better economic value and help simplify system management. It is, therefore, becoming rapidly apparent that the most logical approach to managing the x86 environments within datacenters of the future is to aspire to deliver a fully functioning private cloud environment, an environment that is both dynamic and responsive to the demands of the business, whilst also offering some of the best economic returns in terms of reduced capital expenditure and the lowest possible operating costs. To be clear, not all systems will live in this cloud environment. There will still be some systems which, due to their unique characteristics (platform choice, business criticality, legislative and compliance requirements), may well exist outside of this cloud environment; however, the majority of applications will be managed on a highly virtualized platform.

This new virtual platform does, however, create new challenges for IT departments. Most apparent is the change in the physical characteristics of the systems that they

manage, from the traditional "one application per server" typically leveraging internal or directly attached storage model to the virtual compute "platform" hosting multiple applications and databases connected to some form of networked storage. This new model requires a greater reliance on the systems software to automatically manage many of the tasks that were previously handled manually. Furthermore, the entire notion of the virtual platform also leads to concerns over application to storage connectivity, especially since one of the likely advantages of virtualization is the mobility of applications that it enables across the environment. This inevitably leads to more stringent process planning and automation of execution, and in order to do this, the right tools will be needed to ensure the process is faultless.

## **IMPLICATIONS FOR IT MANAGEMENT**

These changes in both the business expectations and the underlying infrastructure technology also provide IT management with opportunities that can be aligned to the demands of both business and IT goals. However, before these positive results can be achieved, there is some fundamental work that needs to take place.

### ***Asset Inventory***

The logical starting point for such projects is an analysis of what is currently on the IT asset inventory. Here, we are not referring to the hardware components, but the applications that are running within the environments, the interdependencies they have on other applications or databases, storage, as well as the network requirements. This may seem a pointless task – after all, shouldn't IT already know what all the applications are anyway? Sadly for many, this is not the case for a variety of reasons. These include aging albeit robust systems that do not need much in the way of support; skunkworks projects that start off under someone's desk but mature into business-critical systems and somehow never get incorporated into the overall IT portfolio correctly, to mundane areas as network-attached storage (NAS) filers that have appeared. These applications are being used "illegally" but now house critical information. In nearly every organization of some size, there is at least one or two of such "unknown" systems running. Cataloging, prioritizing and indexing these systems is a critical first step that needs to be undertaken before embarking on an organizationwide virtualization program.

Once these applications are identified, the work of understanding the unique characteristics of each application can begin – from performance to network demands, storage requirements to data compliance. Armed with this information across all the systems of an organization, IT management can then start to understand where the challenges and opportunities lie as well as create a more informed picture of where the opportunities to automate can be found.

### ***Room for Better Efficiencies***

An even more pressing issue for IT management is something IDC has been tracking for a number of years now. There is a growing dissatisfaction amongst business users with the efficiency and effectiveness of their internal IT operations. The essence of the issue is that, due to the changes in the business environment the pace of business has increased dramatically and the scale of issues in far-flung countries can directly impact business locally. This was best defined by the global financial crisis of 2009, where we saw a failure of banks in the U.S. led to massive challenges globally as well as in Asia. Whilst this crisis is now past us, the lesson learned was that issues overseas can directly hit business locally and this has led to business demands to be

more flexible and efficient overall. However, IT processes have changed little since the advent of the Internet, and many of these processes were built up over decades as new platforms evolved and were deployed and systems were implemented, all now contributing to the support demands on the IT management team.

The advent of cloud computing has exacerbated this division of opinion, with line-of-business managers being enamored with the "instant on" nature of procuring cloud computing services, whilst IT managers are still hugely reluctant to engage these services due to issues of security, availability and even career protection.

However, the fact of the matter is clear: Cloud computing, be it internal private cloud or external public cloud, is a platform that is gaining inordinate amounts of interest from businesses, largely due to the opinion that this is a more economically beneficial approach that is more aligned to the dynamic nature of the business in today's world. For IT management to regain a deserved place at the strategic planning table, some changes need to be made to the current infrastructure in order to improve the operational efficiencies of IT departments.

## **AUTOMATION – A CRITICAL STEP ON THE ROAD TO 'NON-STOP BUSINESS'**

We constantly hear how IT budgets and resources are not growing and how this translates to IT management spending most of their time on simply "keeping the lights on." As most of the IT department's time and resources are in ensuring that systems meet the organization's daily operational needs, they consequently have neither the time nor the budget to focus on the strategic tasks that add value to the business. One result is that IT budgets are moving from their traditional center and hosted by the business units. The strategic IT budget is now with the business unit whilst the budget held by the IT department is now primarily for support and infrastructure maintenance. Regardless of where the budgets are held, there are technologies that IT management should consider that can help reduce their overhead in terms of time taken and time spent on the basic maintenance of these systems.

One area that IDC sees as critical for achieving the demands of the business is in workload automation and job scheduling. As indicated by the descriptive titles, this area is one that has the potential to offload many of the manual tasks to the software systems, thereby freeing up the valuable time of systems and storage administrators to refocus their energies onto the more value-added program concepts.

Automation and scheduling software is not new; indeed the very concept was defined for the mainframe systems, and much of what was learned here is highly applicable to the new virtualized x86 environment. In a computing landscape where the distinction between applications and databases is defined by the virtualization software, the opportunity, and indeed the demand, for automation are high. For example, data will need to be defined by policies, and these policies will determine where the data is stored for real-time access, the back-up schedules, the restore requirements which in turn will define the archive location and potentially archive media. Complicating this are the virtual platform and storage environment, in which large pools of "compute power" are attached to network storage arrays that have different price/performance characteristics. In order to fully leverage this new environment, it will become essential to have clearly defined policies that map to the data and the devices, and to ensure that this does not become a cumbersome manual process that saps the time and resources of IT, automation is the only possible route to take.

Planning will, of course, become a critical component of this overall automation architecture. Ensuring the right tools are available to help define and implement these policies is also critical to ensuring the realization of the full value of the underlying systems.

## HOW TO AVOID THE POTHoles TO A HIGHLY VIRTUALIZED/CLOUD ENVIRONMENT

### ***Role of Workload Automation***

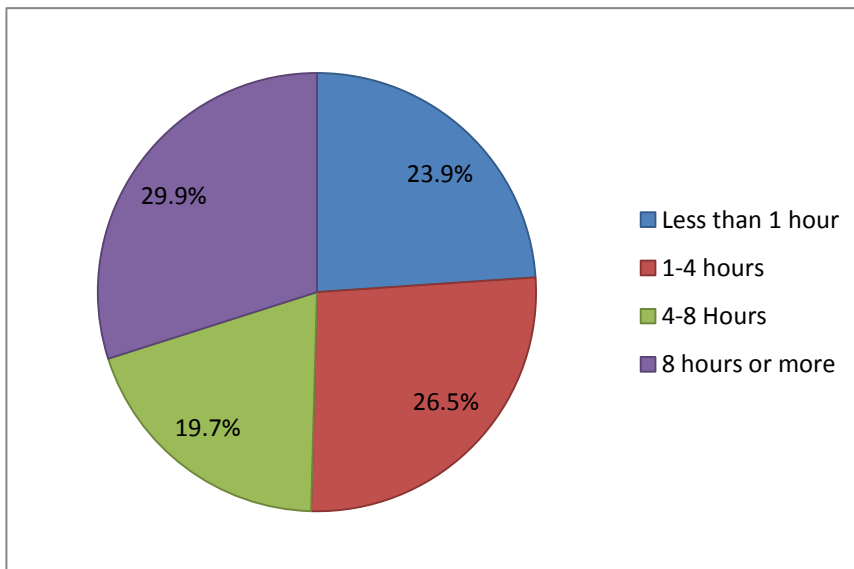
Workload scheduling and automation software manages the provisioning, placement and execution flow of work on systems. The tool brings automation and centralized control to executing the steps contained in IT workloads and processes. This category includes traditional calendar-driven schedulers and event-driven schedulers, as well as workflow engines, run-book automation software and server provisioning software. It also includes workload balancing applications working at the application (rather than system) level.

Much opportunity exists in the realm of automation and workload scheduling, in which the software management tools can launch processes based on different types of triggers (activity or time-based, for example). In a recent IDC survey of over 200 Singapore-based organizations, as much as 30% of manual processes can take up more than 8 hours per week to complete, as shown in Figure 2.

**FIGURE 1**

### Manual Processes Consume Precious Human Resource

Q. How many man-hours per week are required to undertake manual processes in your organization?



N = 200

Source: IDC's *Systems Network Management Software Adoption Survey 2011*, sponsored by Hitachi Asia

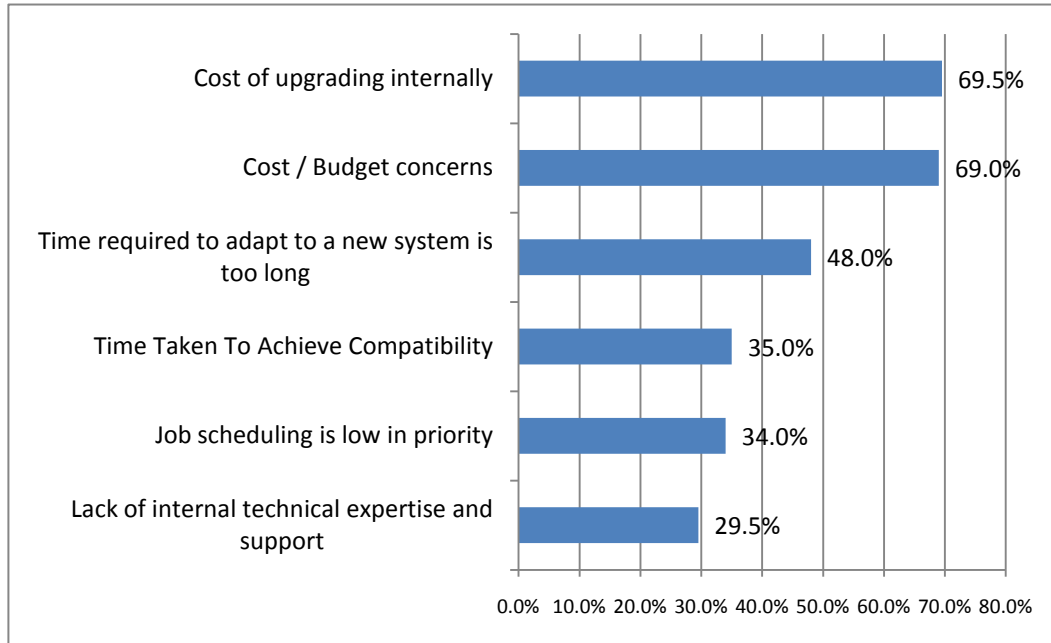
Considering the dynamics of server virtualization, the velocity of provisioning, the ability to move applications across the virtual platform whilst maintaining the corresponding storage and networking interconnects, it becomes clear that the standard operating procedures that have been built up over a period of time are now,

as likely as not, going to become inhibitors to the ability of the IT organization to deliver on what the business requires – and herein lies the IT management conundrum.

**FIGURE 2**

**Budget Concerns Remain an Inhibitor**

*Q. What are your top 3 reasons for not adopting a new job scheduling and workload automation system?*



N = 200

Source: IDC's *Systems Network Management Software Adoption Survey 2011*, sponsored by Hitachi Asia

The same survey revealed that budgets remain the major inhibitor for deploying any form of automation or scheduling, as shown in Figure 2, and yet these solutions should be able to drive greater efficiencies within the organization, allowing valuable resources that are tied up with manual processes to be repurposed to more strategic and value-added tasks. The survey also revealed that of those that had high levels of automation, most organizations had deployed their automation solution as an independent component of their infrastructure and not as a part of a larger system deployment. This would indicate that there are plenty of opportunities for IT management to analyze the internal systems and processes and establish where the job scheduling and workload automation opportunities exist. What then follows is the search for a tool that can address their current and future requirements.

With respect to selecting a tool, it is critical to understand not just the current issues and challenges, but also what the future IT roadmap looks like. IDC recognizes that whilst server virtualization on the x86 platform will become the ubiquitous platform of the future, many organizations are running heterogeneous environments with a mixture of x86 and other server operating platforms. Therefore, a tool, or suite of tools, that can span the entire systems would be the ideal selection. At the same time, to ensure efficiency benefits of standardization can be achieved, such a tool must also be able to span both the virtualized and non-virtualized environments. Finally, such a tool should be relatively easy to understand and use. At a functional level, there are many areas to consider. The survey respondents identified the following as

the top five elements of an automation tool that they deemed essential. The total list was longer as specific organizations highlighted the specific unique demands of their business, but as a starting point the following were considered the most demanded:

- ☒ Automation for tracking assets, change and compliance
- ☒ Integration with enterprise applications
- ☒ Integrated scheduling and automation for both virtual and physical environments
- ☒ Complex event processing and workload optimization
- ☒ Supporting flexible automation with various execution styles
- ☒ Customization according to your environment to increase productivity

One final note on avoiding the potholes is that, when considering the processes that can be automated and improved, organizations also need to look into business processes to ensure alignment. For example, there is little point creating an automated archiving procedure that can archive data on an hourly basis, if there is a business rule that states the business needs to make the decision, yet the decision is made monthly. In such cases (and there are many), it is incumbent on IT to ensure that, whilst technology can improve a process, the business is aligned with this process and any timeline that can deliver greater efficiency and economic benefit.

## **FUTURE OUTLOOK**

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At the pace that technology is changing and improving, the x86 server platform is fast becoming the de facto platform for new deployments. This does not necessarily mean that other server platforms such as RISC and the mainframe will disappear, but their workloads are becoming more specialized and the breadth of new applications are tending to be delivered for the highly virtualized x86 server architecture. The future of the majority of x86 systems is that they will be virtualized – this is unavoidable. Consequently, it is imperative that CIOs understand this new shift in platforms and are ready to embrace what the new systems can deliver.

IDC has developed a model that can help organizations understand the steps to take to achieve an effective virtual environment (see Figure 3) and key to this is moving to a highly automated infrastructure.

**FIGURE 3**

Virtualization Maturity Model

	Pilot	Consolidation	Assured Computing	Private Cloud
<b>Staff Skills</b>	Little or no expertise	Hands on expertise; some formal training	Formal training; certification desirable	Certification required
<b>Technology &amp; Tools</b>	Simple static partitions	Simple Mobility; Manual & Off-hours Matched application pairs	Portable Applications; Automated Failover CMDB Implemented	Policy based automation; Service management; Lifecycle Mgmt; Self Service Delivery
<b>Financial Impact</b>	No substantial financial impact	Measurable Hard Cost Savings: Consolidation Power/Real Estate	Justified TCO savings: Business Continuity	Variable costs recognized or charge back models established
<b>IT Process &amp; Policies</b>	Skunk Works	Ad hoc	Partially Integrated; Partially Standardized	Fully Integrated Fully Standardized
<b>Line of Business</b>	Hidden	Revealed	Transparent	Engaged in Governance Process
<b>Application Usage</b>	Test Development	Production: Non-critical	Production: Business Critical	Production: Service Profiles & Catalogs
<b>% of Customers</b>	15%	55%	25%	5%
<b>Average VM Density</b>	4	6	10	35
<b>Experience</b>	9-12 months	9 months - 2 years	1.5 - 3 years	3-5 years
<b>% Virtualized Servers</b>	<10%	25%	50%	80%

Source: IDC, 2011

Within the maturity model, IDC has identified six areas impacted by the move to virtualization. They are:

- Staff skills
- Technology and tools
- Financial impact
- IT processes and policies
- Line of business
- Application usage

Each of these areas experiences slight changes within their characteristics over the normal development towards a highly virtualized infrastructure, a journey that IDC sees as taking between three and five years to complete. Moving through the four phases, from pilot to consolidation to assured computing and finally reaching the private cloud environment, this chart highlights the issues and impact across these six

areas and measures the extent to which virtualization is deployed both in terms of the total market and the internal percentage of virtualized systems and their density.

### ***Opportunities to Gain a Competitive Advantage***

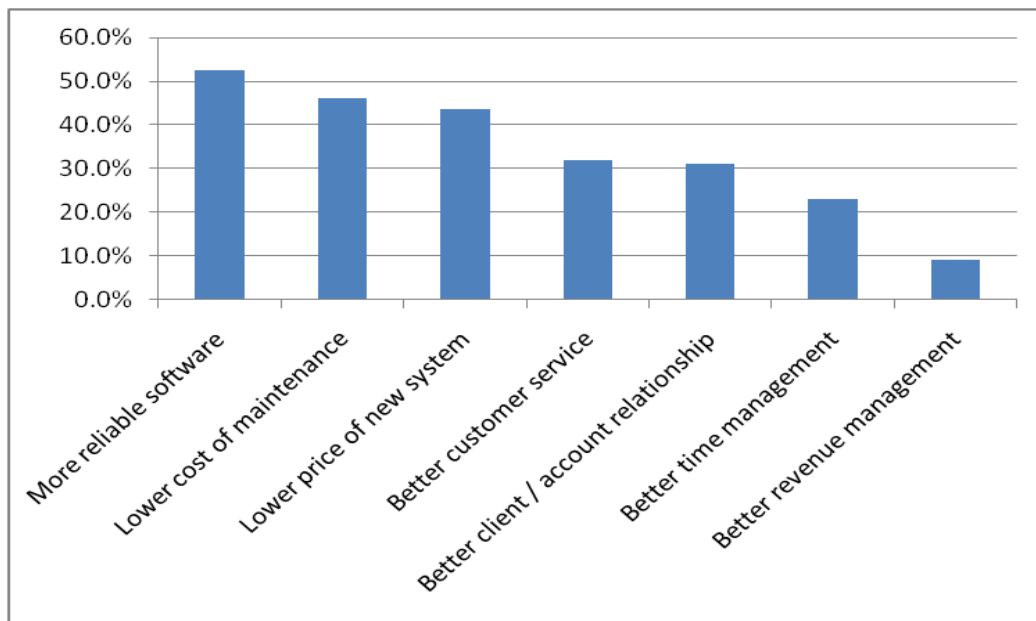
At the same time, the opportunities to also automate the non-virtualized components of the datacenter can also help organizations realize better economic value, but the first steps need to be a thorough analysis of internal systems in order to understand where the current opportunities lie.

Working closely with a vendor of workload automation and job scheduling tools can help organizations understand how and what they can consider in this space since, invariably, the vendors have a wide range of expertise to help accelerate the return on any potential investment in this area. Figure 4 shows reliability as the top reason for organizations wanting to change their current job scheduling and workload management tool.

**FIGURE 4**

#### Reliability and Cost

*Q. What are the top reasons for changing your current job scheduling and workload management system?*



N = 200

Source: IDC's *Systems Network Management Software Adoption Survey 2011*, sponsored by Hitachi Asia

## **CONCLUSION**

The survey undertaken by IDC in the Singapore market shows that this is an area that is significantly underinvested by organizations. Familiarity with the tools, complexity of deployment and vendor support were cited as key issues after those of cost as to what is holding organizations back from investing in this area. However, the reality is that virtualization demands automations. For those organizations that can overcome these challenges, there is a strong likelihood they will gain significant competitive advantage. The speed at which organizations now wish to conduct business and the pace at which internal IT systems need to be managed far exceed the speed at which

things have been done in the past, and this is only set to accelerate. With the myriad of other concerns pressing for the attention of the CIO in today's highly dynamic world, automation may not be at the top of the list, but once it is implemented, many CIOs will benefit from being able to spend less time on concerns about hygiene factors that automation can take care of. This will also enable them to re-focus their energies on driving through more strategic usage and deployment of their organization's IT assets.

## **METHODOLOGY**

This IDC White Paper draws on the results of a custom survey designed to understand Singapore organizations' views toward systems network management software. Sponsored by Hitachi Asia, the phone survey was conducted in April 2011 with a respondent pool of 200 IT and LOB executives.

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