



The ABCs of Workload Automation

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Those of you who have been in the IT industry for a while will be familiar with the term job scheduling or workload management. For a number of decades this functionality has been the mainstay of IT operations; it is used to run the mission-critical business processes on specific days, at predetermined times. It does this automatically and repeatedly without human intervention, allowing hundreds, thousands and, in some cases, hundreds of thousands of jobs to be run consistently and effectively on a daily basis with minimal effort.

Workload automation is the current evolution of those job scheduling solutions, extending what was originally a purely operational capability into a rich application integration tool, assisting the collaboration between development and operational teams to build complex application workflows much earlier in an application's development life cycle than was previously possible with traditional job scheduling solutions.



You occasionally hear the term workload automation, but what does it do and how can you and your organization benefit from it?

The following will help you decode the workload automation alphabet soup and make you aware of just how much more you can accomplish with a technology that started its life as a robust job scheduling solution.



AUTOMATION

Automation is at the core of Workload Automation. It allows you to centrally define simple rules to repeatedly perform processes based not only on specific date/time intervals, but also on randomly occurring business events, such as a database row being inserted, the arrival of a JMS message from an online application or the creation or modification of a file and more.



BUSINESS CONTINUITY

Business Continuity is important for many mission-critical business processes where technology disruptions cannot be tolerated as the work needs to run in the quickest possible time. In these cases, you can implement a second standby workload automation management server that will automatically assume control in the event that the primary management server fails. This “high availability” capability is provided “out-of-the-box,” and there are no additional licensing requirements to implement this option.



CALENDARS

Calendars traditionally determine when each of the workloads are to be run and this has been greatly simplified using Workload Automation. Where a multitude of calendars are needed to be defined and maintained in other job scheduling solutions, often only a single calendar is required with Workload Automation, making the entire job of planning the scheduling of your workloads that much simpler.



D RAG & DROP

Drag & Drop the components that make up the business process steps in your applications using the graphical user-interface design tool. This intuitive process enables team members to build a job stream from predefined workload objects that represent functions to perform. The user then draws any dependencies between the various components both inside the application process and optionally with jobs in other dependent applications. This design approach allows team members to collaborate together and understand the design better. A simulation capability then tests the design without actually having to run it—No more praying that the change you just made will work exactly as intended.



E MERGING TECHNOLOGIES

Emerging Technologies, such as big data, cloud, and integration into other third-party technologies and business applications, such as SAP® & Peoplesoft®, are already codified into a wealth of workload objects that implement functions that you would normally have to code and maintain yourself. This includes tasks such as running a specific program or script, performing a file transfer or running some SQL or invoking a Web or application service to integrate another application component. All of these workload objects consistently implement error handling and alerting with minimal and in most cases—no coding.



F ORECAST REPORTS

Forecast Reports and GANTT charts can be produced based on the historical runtimes to allow you to predict when future workloads will run. These tools are useful to determine the best times to minimize the impact of taking servers out of commission so that critical maintenance can be performed on them.



GLOBAL

Global real-time approach to designing, planning and monitoring workloads in a single solution improves staff efficiency and eliminates the problems you have with multiple scheduling solutions, such as CRON. Now an application can run across multiple servers without you having to concern yourself with coordinating that work across the different servers, speeding your deployment of new or modified applications. The central manager orchestrates these workloads across multiple platforms and can provide dependencies between jobs in different applications, ensuring those workloads run in the correct sequence and that they run as soon as any dependant tasks or events have successfully completed. Because everything is now managed centrally, you can now easily run or schedule reports that display the success or failure of jobs across the entire enterprise.



HADOOP

Hadoop may not be on your radar just yet, but rest assured Advanced Integration supporting predefined processes for Hadoop will be available when you are ready to take advantage of this technology. In addition to Hadoop, there are many other predefined workload objects that will help you integrate other data storage systems into your application workloads (database integrations, SQL Server and more).



INHERITED DEPENDENCIES

Inherited Dependencies is a unique capability within Workload Automation. To cater for different application runtime requirements, you often need to separately define those set of job steps that run daily, weekly, monthly, etc. and then build calendars to determine which job stream runs today. In Workload Automation you define everything in one single application definition which then modifies itself by dropping those steps that don't need to run today. The dependencies between the remaining steps are then automatically inherited from the original design. This simplifies and makes for a more intuitive job stream design and eliminates complex calendaring requirements.



JOB SCHEDULING

Job Scheduling is a major part of workload automation. With Workload Automation there is no need to write and maintain code to piece together the job steps in an application's job stream. Instead the job stream is constructed by graphically painting workload objects that represent the combinations of commands or scripts together with other monitoring and application integration functions necessary to support your applications. A user simply drags and drops a workload object and then enters parameters that define what needs to run, where and when. These job streams are then invoked using traditional date/times events and more often by "event sensors" that detect that something has occurred in the business. The Workload Automation manager is scalable to run from hundreds to over millions of these jobs steps per day. A JavaScript™ capability enables fragments of programmable code to be incorporated should some specific functionality be required.



KEYS

Keys are defined using AES, BLOWFISH, DES or DESEDE defined cipher algorithms to encrypt and protect communication traffic between the Workload Automation manager and remote agents running the workloads thus protecting any login information required to access and run work on those servers.



LOAD BALANCING

Load Balancing is simple to define in Workload Automation, allowing work to run on a number of nominated servers. Jobs requiring load balancing simply point to a group of servers rather than a single target server and Workload Automation automatically determines the best place to run the work at actual runtime based on various rules such as round-robin or available CPU resource.



MONITORING

Monitoring is performed using the same graphical interface used to define the workloads. It has visibility of all work running across the entire enterprise, no matter what operating system platform the work is running on. Multiple windows of information can be defined to display exactly what each user needs to see. A view of only those jobs in trouble, for example, enables a user to manage by exception. Applications can also be monitored in their graphical form and the user can watch each step change status (and colour) as it runs. A progress bar shows the percentage of the total application completed.



NO NEW DAY PROCESSING

Simplify your automation by eliminating the need for New Day processing. Many other job scheduling solutions require each day's schedule to be built and distributed by the management server at a predetermined time each day. This takes time and the heavy processing load impacts work running at that time, plus this new day behavior also has to be taken into consideration when designing the job streams and schedules. This may have been acceptable in the past, but in today's world, where job streams can be randomly invoked at any time in the 24 hour business day by a multitude of events happening in the business, this new day approach adds an unnecessary complication to defining and running your workloads.



OPERATIONAL TASKS

Operational Tasks are easily performed using the graphical user interface, allowing operations staff to efficiently manage the workload automation environment and the running workloads. As an example, should a problem be encountered, an entire application or specific job steps can be put on hold using a single mouse click. Agents can be quiesced to stop jobs starting on a specified server (it may need to be shutdown to have a hardware problem resolved for example) and brought back online later to enable work to flow to the server again.



PROBLEM DIAGNOSIS & RESOLUTION

Problem Diagnosis & Resolution is simple in Workload Automation because you can easily explore errors from the graphical interface. A failed job step can be examined and the spooled output reviewed using mouse clicks. After corrections are made, the job step can be resubmitted to allow the application to continue. All of this can be accomplished from within the graphical user interface, eliminating the requirement to log into each server to find out where the application failed and to check the logs and output.



QUICK

Quick and easy to install and use, Workload Automation will have you up and running more effectively in no time at all. Broadcom and our partners can also help you with any existing definitions you might currently have in other job scheduling solutions to migrate and consolidate them into a new workload automation instance, enabling you to manage your entire enterprise workloads from a single solution. We also have a conversion factory that can take definitions from other scheduling solutions and convert them to Workload Automation.



ROLE BASED ACCESS

Role Based Access allows Workload Automation to be used securely by many different types of users. Unlike simpler scheduling solutions, like Cron which have no built-in security, now you can easily control who has access to what and then, later, run audit reports that show who did what and when. Workload Automation uses a combination of its own internal role based access control and an optional external directory system to determine what users are allowed to access the solution. Groups of users can be established and access rules defined to determine what those users are able to see, and what they can do, providing multi-tenancy like capabilities. Business users can even be given read-only access to their applications so that they can watch them run and view output online.



SERVICE LEVEL AGREEMENTS (SLAs)

Service Level Agreements (SLAs) are easily managed by Workload Automation without having to install any additional components as SLA management and Critical Path Analysis capabilities are already built into the management server. Minimal effort is required to implement alerting that will warn you that a job stream is not going to make its due out time. Now you will get alerted as soon as the wheels start to fall off and not just after the due out time when the business expected to get their results. This buys you more time to resolve the situation to either minimize your exposure or get the process back on track and avoid a missed formal or informal SLA, improving your customer satisfaction. Critical path analysis also helps you identify the longest paths through your applications so that you can concentrate your throughput improvement efforts on those parts of the application that will provide you the greatest return.



TOOLS

Tools are integrated and easier-to-use than many other job scheduling solutions. A single graphical user interface allows users to define, maintain, run, monitor and problem solve job streams. The simple architecture of Workload Automation means there are no additional components to install and configure. The management server is completely self-contained, making installing and later upgrading the solution a breeze.



UPGRADE IN PLACE

Upgrade In Place means you spend less time updating your software and migrating job definitions between versions. Now you simply stop the server and backup the database. An upgrade process copies your existing environment in case you need to roll-back, and an upgrade is then run “in place”. You restart the server and the upgrade is completed. No longer will you need to set up additional servers and install the new version, copy over all the existing definitions and configuration parameters from the old environment, test the new environment and then schedule a cut-over from the old to the new.



VISUALIZATION OF COMPLEX APPLICATION RELATIONSHIPS

Visualization Of Complex Application Relationships using the graphical user interface allows teams to make informed and intelligent application design decisions. Being able to see the entire application’s processes visually with intuitive icons representing the activities that the application performs and the dependencies between each of these steps makes it easy for all participants during the application’s design phase to communicate and explore their ideas and simulate the design before it even reaches an execution state.



WEB & APPLICATION SERVICES RELATIONSHIPS

Web & Application Services allow you to “glue” traditional batch style processes to real-time applications both inside and outside of your organization and coordinate activities between these various components. Workload objects implement the various web and application services methods without you needing to write any code to call the APIs. You simply provide the necessary parameters in the workload object and Workload Automation does the rest.



XCROSS PLATFORM SCHEDULING

Xcross Platform Scheduling allows you to run and coordinate business application processes on a variety of different operating systems and application platforms. Complex dependencies can be defined across these platforms and it is even possible to have a dependency on a job step in an application running on another instance of the workload automation scheduler.



YESTERDAY, TODAY, LAST WORKDAY OF MONTH

Yesterday, Today, Last Workday Of Month are just a few of the many pre-defined English scheduling terms that can be used in Workload Automation definitions. These can be combined to represent complex scheduling terms, such as FRIDAYS EXCEPT FIRST AND LAST DAY OF MONTH, which the workload automation engine resolves into actual dates at runtime without you having to define any calendar entries. You can even define your own unique business specific terms, such a BILLING_DAY. This makes for simpler, more intuitive, easier to understand and self-documenting scheduling criteria in your workloads.



Z/SERIES

Z/Series workloads can also be managed from your distributed workload automation environment, allowing you to manage an entire enterprise's workload using a single workload automation solution and associated skillset. You may not currently have a mainframe in your environment today, however you can rest easy with the understanding that should your company merge with or acquire another business running a z/Series platform, that you can place dependencies on and manage workloads on that platform too, via an agent placed on the mainframe.



Workload automation has indeed come a long way since its genesis as a corporate job scheduling solution. Now it is a sophisticated, scalable, application integration solution enabling you to define, run and manage complex application workloads across all the popular operating system and business application platforms in your enterprise.

It does all the above and more, and you don't have to be a large organization to benefit from this technology as it scales downwards as well as up, and it has a much lower Total Cost of Ownership (TCO) than you might expect.

If you would like to learn more about Workload Automation or have any questions, please do not hesitate to contact your local Broadcom office to speak with one of our Workload Automation specialists.

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