Cisco Standardizes Workload Automation Across the Enterprise

Cisco Tidal Enterprise Scheduler Helps Cisco IT Reduce Costs, Increase Efficiency.

EXECUTIVE SUMMARY

CHALLENGE

- Reduce the support overhead associated with managing existing data center workload schedulers
- Standardize job scheduling across the enterprise, both in the data center and beyond
- Move to a platform that is easier to use and provides the foundation for client self-service
- Save time creating new processing workflows and on-the-fly changes to existing jobs

SOLUTION

- Cisco® Tidal Enterprise Scheduler
- Cisco Tidal Enterprise Scheduler Adapters for Informatica, SAP, Oracle, and Hadoop
- Cisco Tidal Enterprise Scheduler iPhone App
- Cisco Prime™ Service Catalog

RESULTS

- Reduced complexity of IT operations, and reduced dependence on central IT group because users gained more control over workloads
- Reduced operational overheads such as training new clients, due to ease of use
- Easier maintenance and faster scheduling because of wide range of adapters
- Faster execution with fewer errors due to precise, informative alerts and the ability to restart jobs from any point in the workflow
- Fewer dependency-related errors and delays due to greater control over calendars and timing
- Greater control and visibility due to granular control over workflows and nested dependencies

Challenge

Complex data centers require complex workflows, and workload automation tools help manage these workflows. But workload automation tools have changed a great deal in the past few years. “Just a decade ago,” says Ian Reddy, Cisco IT senior manager with the IT Automation Services (ITAS) group, “IT organizations evaluated workload automation solutions very differently than they do today. It is fair to say that when workload automation became popular, the emphasis was on finding the most sophisticated tools, and the associated complexity was considered inevitable. Developers scheduling jobs did not spend a lot of time worrying about things like ease of use or on-the-fly adaptability. We assumed that the price of sophisticated workload automation was additional overhead on IT support and extensive training for end users.”

Today, the picture has changed entirely, and simplicity is as highly valued as sophistication. Enterprise organizations are keenly interested in empowering users to be more self-reliant. “Frankly, I think a lot of IT people are tired of tools that require heavy training before a client can even think about being productive,” says Reddy.

“Our clients are diverse. So whether they support applications or infrastructure, or whether they are in functional areas such as R&D and need data center resources, it doesn’t matter. We want to give them the ability to handle complex job creation and create workflows without a degree in advanced scheduling. The emphasis today is on tools that allow large numbers of people to ramp up and be productive quickly. Whenever it makes sense, we should help clients move away from dependence on specialized knowledge to make it easier for them to perform their jobs more effectively,” says Reddy.

With that exact mandate in mind, Cisco made the commitment to migrate all of its workload automation jobs to one platform—the Cisco Tidal Enterprise Scheduler (Cisco TES).

"Even if Cisco had not had a great workload automation solution in its portfolio, we would have initiated an assessment of the latest technologies in the marketplace," says Sudheer Keshav, Cisco ITAS engineer. "It is important to reevaluate existing platforms that have been around for a long time, to make sure that you are not staying with something just because it is entrenched and familiar. You get used to a platform and build up an infrastructure around it, and you can get locked into that tool whether or not it is the best system anymore. We have the same needs as our customers—to make sure we are using the best solutions to support our business needs today and into the future."

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Solution

Many enterprises have not standardized on workload automation solutions, leaving different teams in data centers of a large enterprise to select their own workload automation tools. Until recently, Cisco used two different batch and real-time job schedulers in data centers around the world. Cisco's scheduling products were:

Existing Job Scheduler 1

A decentralized batch and real-time job scheduler that each client application team managed, with additional support from the Cisco central IT group. This scheduler was heavily used to manage a wide variety of jobs across the enterprise.

Existing Job Scheduler 2

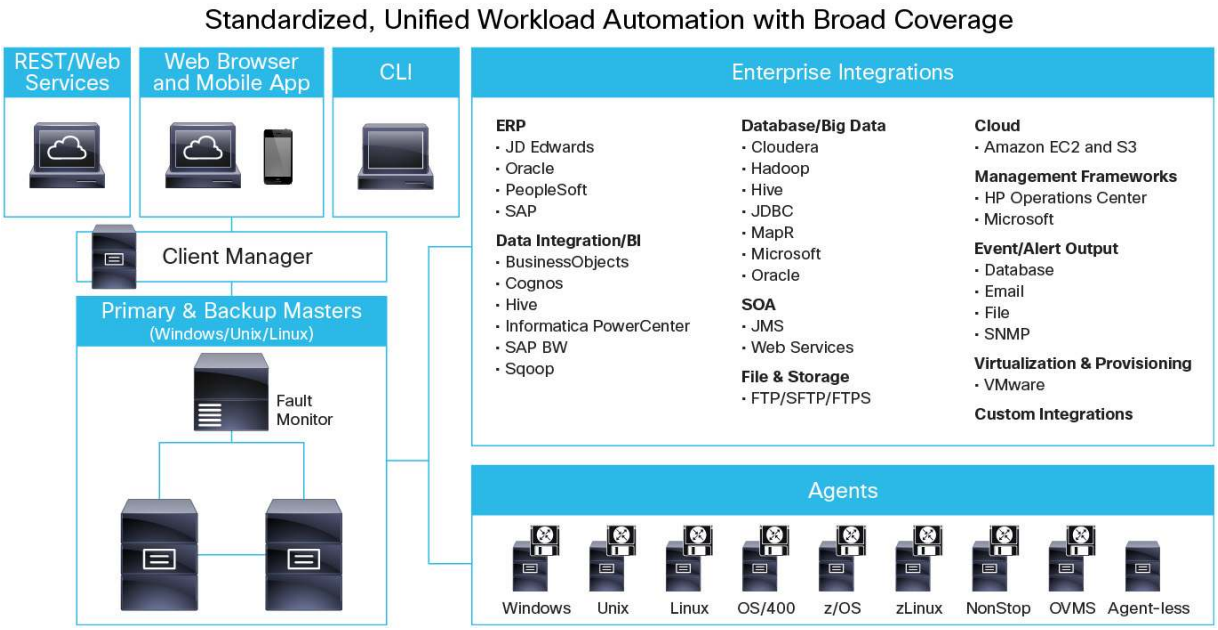
A centralized batch and real-time job scheduling managed only by a Cisco central IT group dedicated to the solution. This scheduler was dedicated to SAP Business Objects and SAP-related workflows.

These two job schedulers are very different from each other in their approach to scheduling and administration of the overall scheduling system. Because of the different usage models, the two migrations to Cisco TES had to be handled quite differently. Fully migrating Job Scheduler 1 workloads to the Cisco TES solution is expected in 2014.The migration from Job Scheduler 2 is already complete.

The company could standardize on Cisco TES in large part due to the broad coverage the solution provides. The adapters in Cisco TES range from diverse technologies such as Oracle to SAP BusinessObjects, Web Services, SAP, Microsoft SQL Server, and new data center technologies such as Hadoop and Sqoop.

An extensible framework of adapters, which enables workflows to cover a wide array of data center technologies involved in end-to-end business processes, is shown in Figure 1.

Figure 1. Framework of Data Center Technologies Involved in End-to-End Business Processes



Replacing Job Scheduler 1

For Job Scheduler 1, a central IT team provides and supports the infrastructure, while the client application teams are responsible for everything else. Each client application team, including human resources, finance, and supply chain, has its own instance of the software running on its own server. There are about several hundred instances of Job Scheduler 1 across Cisco that support workflows including Linux, Informatica, Oracle ERP, and some Business Objects.

In order to work with this scheduler, each application team requires a certain level of technical knowledge and programming skill. “IT has invested a lot of time developing training materials for Job Scheduler 1 over the years, and our clients invest a lot of time in training their people,” says Derkje Scholten, Cisco IT manager. “It is a steep learning curve—the scheduler is simply not as intuitive as Cisco TES.”

About 250 application teams across Cisco are using Job Scheduler 1, and some, such as Enterprise Data Warehousing, have as many as 60 to 70 people using the platform. There are about 340 distinct application codes, which roughly correlate to the number of teams. “Imagine the training hours that those groups absorb and the disruption when people change roles. They lose all that knowledge and have to start all over again training new people. It is disruptive and frustrating for our clients,” says Scholten.

"These days, you cannot underestimate the importance of an intuitive user interface," says Ramesh Nagalingam, Cisco IT manager. "With our current system, clients cannot simply jump in and use the software to start building and scheduling workflows. In order to connect to a database, for example, you have to script a sequence, which can take twice as long as using a Cisco TES adapter. With Cisco TES, you do not have to rewrite scripts every time you want to add a new job to the workflow, either. Anytime scripting is involved, there is a greater margin for error."

Recently, Sudheer Keshav had to coordinate four teams—database administration, system administration, the client team, and IT—across different time zones to set up a new job in Job Scheduler 1. It took about a week to organize the process. With Cisco TES, he says, it would have taken less than a day and involved only two teams. "With the existing scheduler, it could take up to four days to onboard a new job, compared to a half hour with Cisco TES. We anticipate a much higher level of client satisfaction with Cisco TES based on the time savings alone."

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Thousands of jobs are maintained by the client application teams, so the migration to Cisco TES will take several quarters. Prakash Hemchand, lead engineer for enterprise job scheduling services, estimates that the jobs for Job Scheduler 1 began transitioning at the rate of about 70 to 80 a week, but that number has grown quickly as word spreads. "Most people are excited to move to something new. They hear that other teams are finding the new technology faster and easier to use, and they want the same benefits," says Hemchand.

The IT organization identifies opportunities for the transition, usually when an application team needs to make a change in their production environment. The process involves an analysis of the outcomes using Job Scheduler 1 compared to the outcomes with Cisco TES. "We want to show clients the value that they will get, so that they are excited about moving to the new platform" says Hemchand. "We follow a service engagement process for all new projects." Clients provide a lot of detailed input. IT provides the best practices, FAQs, and training for the clients. Eventually, onboarding to Cisco TES will become more streamlined because scheduler accounts and access will be executed as a service request through the Cisco Prime Service Catalog, a self-service portal.

Replacing Job Scheduler 2

Cisco IT used Job Scheduler 2 to schedule Business Object/Business Analyzer and SAP-related jobs. Over 75 percent of the jobs scheduled with the existing scheduler were for the supply chain organization. "If those jobs do not run, Cisco does not produce and ship products," says Keith Abass, Cisco IT analyst.

This migration involved moving six client teams and several thousand production jobs to Cisco TES. Because of the focused scope of this application set, the transition to Cisco TES was achieved relatively quickly, within a couple quarters.

The migration process uncovered loose ends that might have gone undetected for years. “In the time before we made the cutover, we found a lot of jobs that I would characterize as neglected,” says Scholten. “They were not doing what they were supposed to do, and that came to light because Cisco TES handles them in a different way. Some dependencies that were overlooked were more noticeable with Cisco TES. So we gained efficiencies by eliminating jobs that did not need to run anymore.”

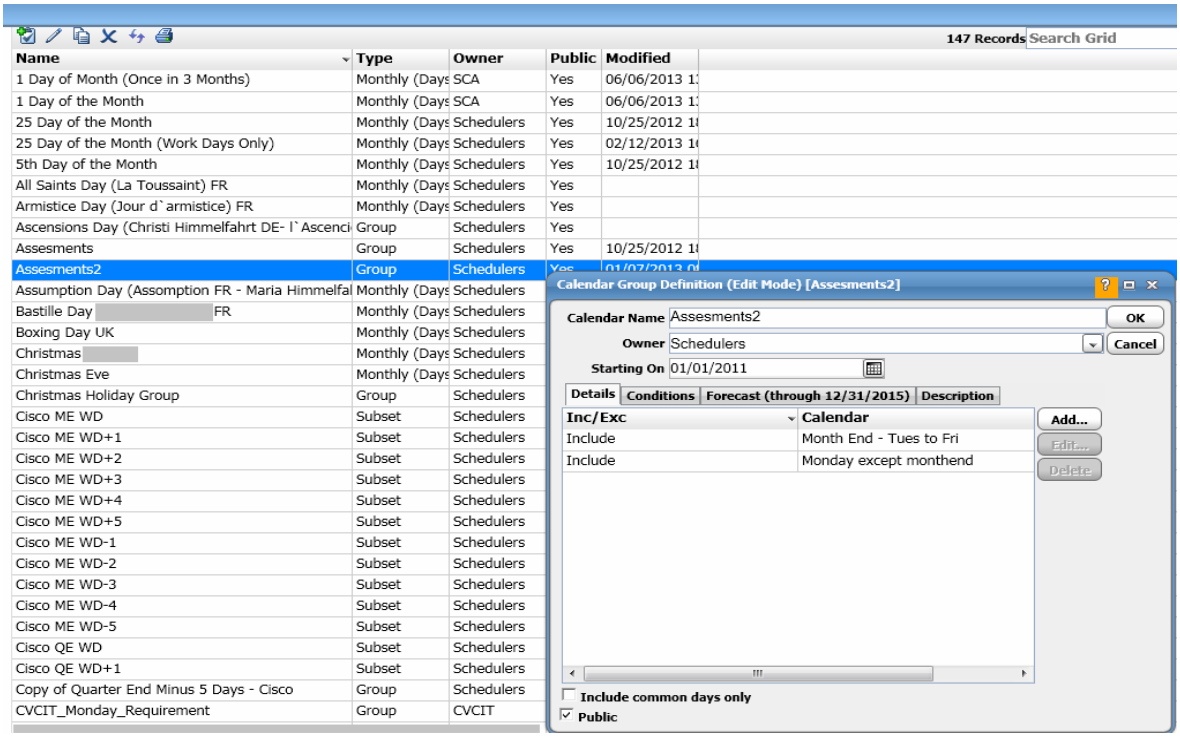
Abass added, “We were even able to put in fixes for special quarter-end jobs, which are very large jobs that run only a few times a year, before they even ran.”

Compared to the existing schedulers, Cisco TES not only will report that a job is completed, but also will monitor the file size. “That granular control is useful. Clients can set a limit to changes in the file size, and if the limit is exceeded, the job will be stopped, keeping everything more clean and efficient,” says Scholten.

Another time saver for clients is the inherited agent feature in Cisco TES. Clients can set up one database and then generate or create a database list. Any change to one database is reflected in the entire group, saving time and the likelihood of errors due to having to manually touch each database connection.

Another advantage that clients are starting to see is the ability to change jobs and calendars on the fly. “In Job Scheduler 2, you really needed to know where to go and how to change things. With Cisco TES there is a simple dialog box where you just make the change and hit ‘OK.’ Then you select the data you want, and you are done,” says Scholten. Changes to the scheduling calendar can easily be made easily as needed via a simple dialog box, shown in Figure 2.

Figure 2. Changes to the Scheduling Calendar via a Dialog Box



Results

Client Teams Gain Speed and Flexibility

As of this writing, the migration of Job Scheduler 1 is well underway. There are several thousands active jobs scheduled for migration per quarter. The IT team expects that the total number of jobs, tens of thousands, will be largely migrated within a year. “The ease of use is compelling. Clients can get to work faster because the learning curve is so much shorter,” says Hemchand. “If you reduce each job from five or ten minutes to two minutes, depending on the job, and multiply that by 150,000 jobs or running hundreds of jobs a day, you realize how those minutes add up to very significant productivity gains.”

Cisco TES alerts are easier to implement. The existing system required separate licenses for alerts, which added to the cost of the scheduler. The alerts then had to be integrated with the batch alarms and prioritized based on the action required, which added more bulk to the scripting. “With Cisco TES, it is now much easier to set up alerts, which helps us with corporate governance and Sarbanes-Oxley (SOX) compliance. We get audited every quarter, and we can show that we sent out alarms for each job failure,” says Hemchand.

Hemchand says, “Clients appreciate the fact that Cisco TES is a better-integrated solution that is extensible so it can cover a heterogeneous data center because it offers a particularly strong adapter portfolio. For example, one client scripted an entire framework to facilitate calling Informatica jobs in Job Scheduler 1. Cisco TES has an Informatica adapter that allows the client to use the GUI to select the jobs they want without any scripting. When you select from a list instead of typing, there is less room for errors, and it is faster and easier to change later.”

The IT group is in the process of putting many more adapter-based workflows into production in Cisco TES, including Informatica, SAP BusinessObjects, Oracle EBS Adapter, and Oracle Database Adapter.

The largest migration to date for Job Scheduler 1 to Cisco TES is the Cisco Customer Value Chain-Information Technology (CVCIT-360) group which includes nine job groups consisting of manufacturing supply chain, enterprise data services, and order management jobs. The CVCIT-360 group recently concluded several proofs of concept using the Cisco Tidal Enterprise Scheduler Adapters for Hive, Sqoop, and MapReduce, which were specifically built to streamline workload definitions and job management for Hadoop clusters. CVCIT-360 is in the process of migrating all of its Hadoop job scripts to these adapters, which will save many hours of scripting overhead and reduce the risk of manual errors.

Sudharshan Seerapu, a Cisco IT engineer with CVCIT-360, says, “We connected the dots by performing business process integration and managing big data workload. The rapid rate of deployment of Cisco TES jobs into production encouraged us to migrate more of our jobs every week.”

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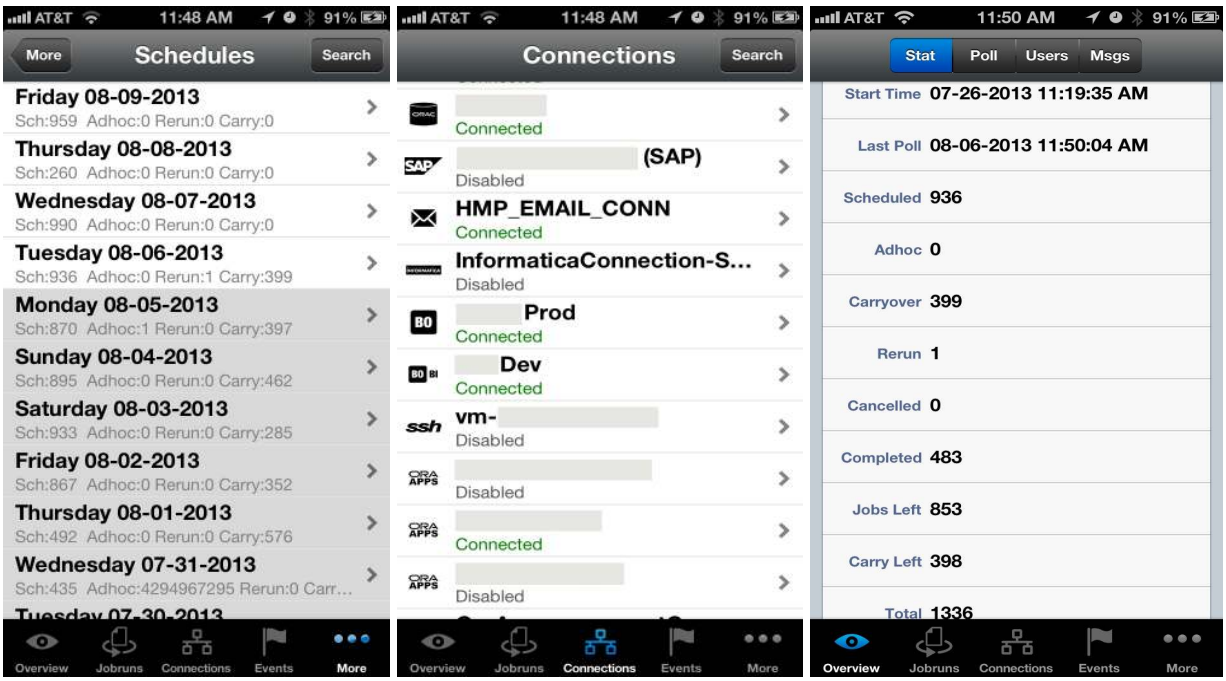
Clients are also enthusiastic about the Cisco TES iPhone app. IT is in the process of deploying the app to their user community. “It is an absolutely ingenious capability,” says Hemchand. “If a job fails, the client administrator

can restart the job, check the logs, and get an idea of what the issue is. We are confident that each client's production support team will love using this mobile app."

The snapshot in Figure 3 shows how the Cisco TES application works on an iPhone.

Figure 3. Cisco TES Application on an iPhone



Cisco TES has other advantages that clients are beginning to discover, including:

- Cisco TES has about 140 calendars that Job Scheduler 1 does not have, and it is easier to create and manage calendars in Cisco TES.
- Cisco TES gives clients tighter and more granular control over job sequences and nesting of dependencies.
- The administration of Job Scheduler 1 scales linearly, because it is a decentralized environment. This means greater survivability because each instance is independent, but it makes the environment much more expensive to maintain.
- There are fewer steps in generating metrics using Cisco TES compared to Job Scheduler 1, which requires scripting to export metrics.

Client Teams Look Forward to More Empowerment with Self-Service

Any migration requires a period of normalization when people have been working with one scheduler for a long period of time. But as that normalization progresses, the central IT group is getting ready to move to a new standard support model.

In the new support model, clients will have more control over their jobs, with less dependence on the central IT group. "We are moving to a self-service model, and the migration to Cisco TES was the first crucial step in that

evolution," says Scholten. "Self-service is the future it is what our clients want. It is the foundation for speed, greater business agility, better compliance, more proactive support, and saving money."

A Global, Unified View

With a decentralized scheduler such as Job Scheduler 1, IT had no unified view of jobs. If there was a problem that the client team could not resolve, the IT department had to dispatch someone to work on that particular server. Now, as Cisco TES continue to be deployed, the central IT group is gradually getting a global view of all job processes via a single pane of glass.

In addition, with two different job schedulers replaced by one centralized platform, for the first time different IT teams based far from each other are teaming more closely. A single team, instead of separate teams, administers Cisco TES across the enterprise. The team works with clients to help them develop and transport jobs between the different environments.

Next Steps

In addition to completing its migration to Cisco TES, the IT team is working on increasing self-service and empowering clients to schedule jobs more easily. To that end, the IT group is developing a catalog on Cisco Prime Service Catalog for onboarding new clients and jobs via Cisco TES. The goal is to design the storefront so that clients can set up jobs by answering few questions, and the whole process will take a few minutes.

Also, the team is working on advanced integration with enterprise automation and orchestration technologies such as Cisco Process Orchestrator to enable more flexibility, workload mobility, dynamic workload management, cloud integration, and power in communication and alerting.

Ultimately, when the two schedulers have been replaced and IT has standardized fully on Cisco TES, the innovation in workload automation will continue to accelerate.

For More Information

To learn more about Cisco Tidal Enterprise Scheduler, visit http://cisco.com/go/workloadautomation.

To read additional Cisco IT articles and case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT at www.cisco.com/go/ciscoit.

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