

Cisco Tidal Enterprise Scheduler



Product Overview

Data center automation is critically important to IT departments that are focused on unifying and standardizing their operations management. Automation technology supports data center initiatives because it helps simplify day-to-day operations, reduces costs, and promotes IT and business flexibility.

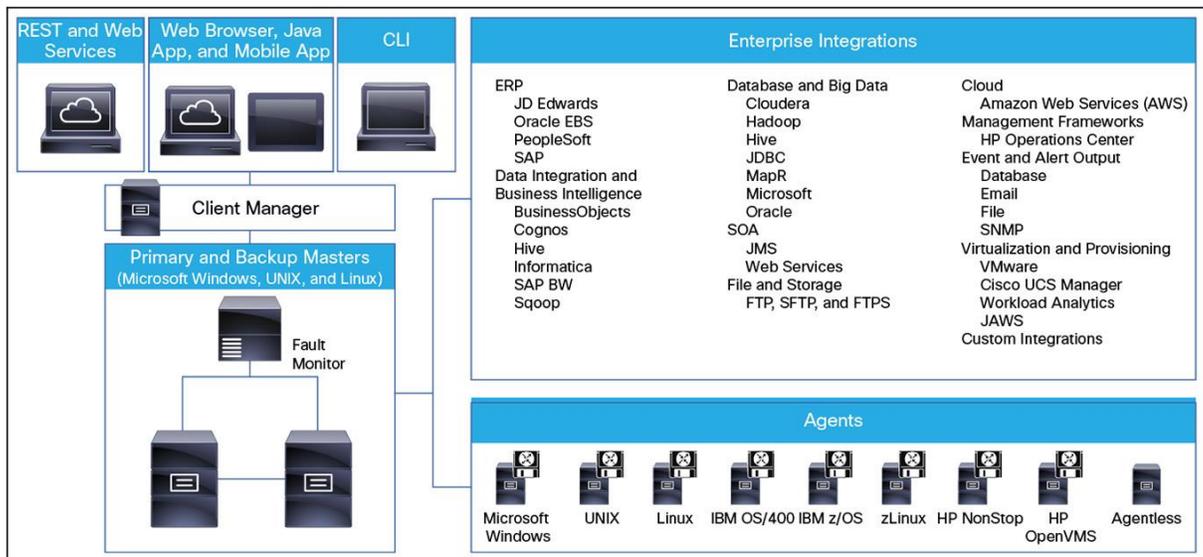
Workload scheduling is an important category of IT operations management that gives organizations the control and visibility necessary to operate today's dynamic data centers. Automation of business process workloads is essential to complex data centers because it helps them operate more efficiently and reliably. Cisco® Tidal Enterprise Scheduler (TES) is the industry-standard workload automation (WLA) solution, transparently automating critical scheduled and event-based interdependent business processes.

Cisco TES connects to heterogeneous environments, creating an infrastructure service platform, providing end-to-end management of critical operation tasks and data throughput. With this enterprise wide scheduling solution that automates complex processes and adapts to changing environments, IT managers can quickly add business value by improving the quality of service-level agreement (SLA) delivery, reallocating resources to business-critical projects, and supplying the accurate data-processing results necessary for strategic decision making. This approach to workload management dramatically reduces human errors and the inefficiencies of script management.

Cisco TES is an automation platform for cross-application and cross-platform operational workloads, batch-job scheduling, and data-integration throughput. Cisco TES can easily configure and run scheduled workloads and event-based business processes, integrate the commercial and custom applications these processes use, and determine which tasks to run - and where and when to run them - without the need for human intervention, customization of existing tools, or knowledge of new scripting languages. Additionally, Cisco TES provides a single view and point of control for all business processes and the jobs that comprise them.

Developed as an n-tier Java architecture application, Cisco TES can scale to meet the most demanding SLAs. It is currently in production worldwide, handling hundreds of concurrent users, managing thousands of connections, and running hundreds of thousands of jobs a day. The scheduler connects to and can manage complex workloads on many popular OS platforms and integrates with major enterprise applications and standards-based technologies (Figure 1). Cisco TES can be implemented quickly, allowing users to accelerate time-to-value while simplifying their entire workload-processing environment.

Figure 1. Support for Cross-Application and Cross-Platform Workload Management



Features and Benefits

Cisco TES offers a range of features that work together to meet IT’s needs for enterprise visibility, scalability, and coverage and the daily creation and management of complex workload schedules.

By automating complex workloads with Cisco TES, IT can positively affect SLA delivery in the following ways:

- Increase efficiency by simplifying batch processing across the distributed enterprise
- Enhance SLA reliability and reduce expensive downtime through workload analytics, alert automation, and a high-availability failover platform
- Improve competitive advantage by delivering error-free data processing
- Support a proactive mode of operation by complete workload visibility, predictive analytics, self-service job implementation, environmental awareness, and automated error remediation
- Improve comprehensive auditing and tracking information in support of compliance with IT policies and procedures
- Improve IT staff productivity through web, mobile, and Java clients and customized self-service portals

Extensible and Scalable Design

Cisco TES gives IT managers a global view of their enterprise workloads through a single-pane view, regardless of how many applications or systems are touched by the defined workload. Cisco TES accommodates multiple levels of dependencies and complex groupings, making it possible to automate extremely complex job streams, while scheduling them through a hierarchy of standard and custom-defined calendars and programmable events.

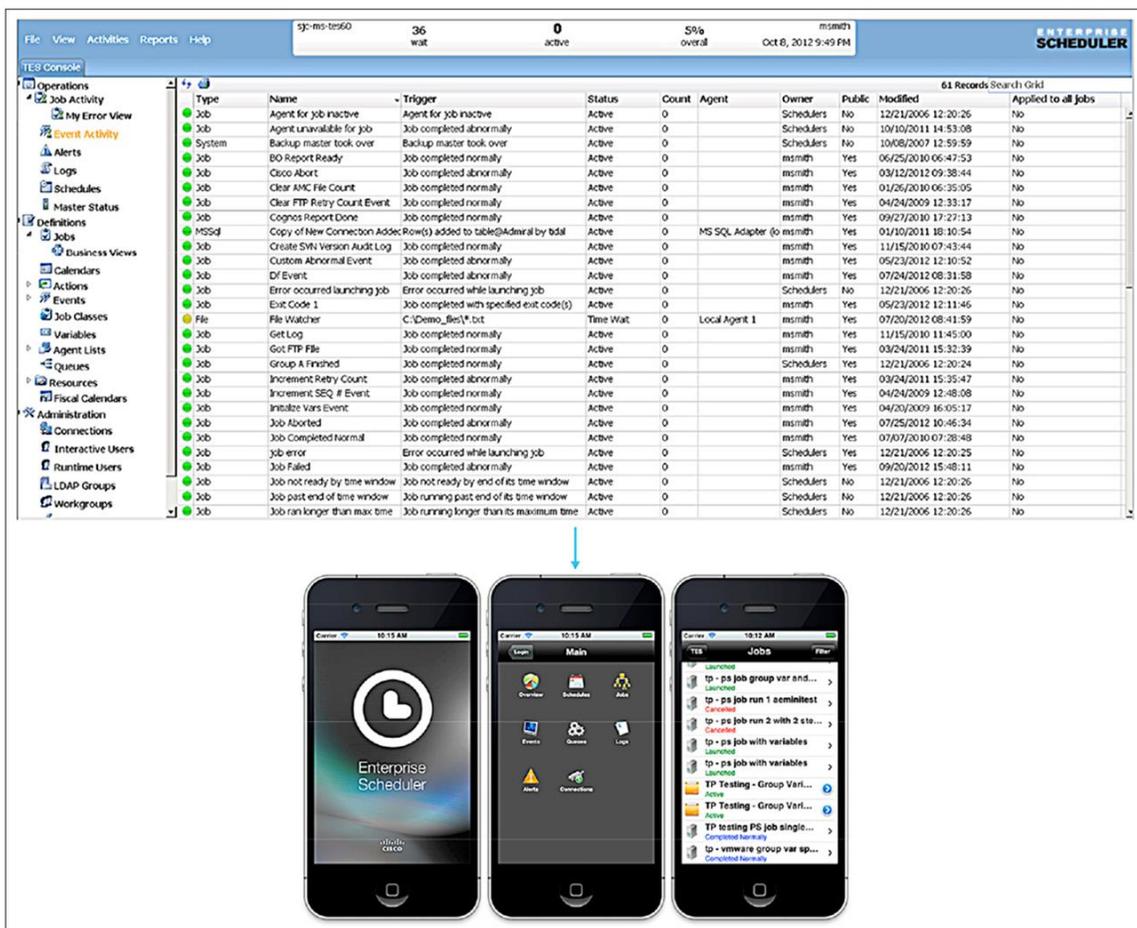
Cisco TES uses a multitier architecture to provide a single solution that meets enterprise needs for performance, extensibility, and scalability. Separate architecture layers provide a stable, extensible framework, allowing it to handle challenging workloads reliably.

The enterprise scheduler primary focuses primarily on the storage, management, and implementation of job schedules. One or more client managers orchestrate user interactions. This n-tier architecture and the decoupling of core functions enable organizations to scale both up and out, allowing them to support a large number of concurrent users and jobs without degrading management or processing performance.

Jobs and job streams are defined and managed through an intuitive GUI through which administrators can define the many dependencies of enterprise business processes (Figure 2). Users can also access detailed performance statistics for all jobs, past and present, and monitor processes as they occur. The scheduler supports real-time event and alert management, increasing uptime and SLA delivery levels.

Cisco TES allows control of jobs and management functions from mobile devices. The Cisco TES mobile app lets you manage adapter and agent connections and override, hold and stop, and release and resume jobs. Management functions also include the capability to filter and view jobs, alerts, events, schedules, connections, queues, and logs.

Figure 2. Web Interface with Mobile Management: Single Point of Control for Enterprisewide Workload Automation



Enterprise Application and Database Coverage

In the heterogeneous and virtualized environments that characterize today's data centers, flexibility and reach are critical. Cisco TES automates the scheduling of traditional enterprise applications, as well as complex, decoupled, and often widely distributed service-oriented architecture (SOA) applications, which frequently run on different OS platforms.

The enterprise scheduler integrates transparently with leading applications, such as SAP, Oracle, JD Edwards, PeopleSoft applications, and databases, such as Microsoft SQL Server and Oracle databases, using specifically developed application adapters. Adapters for scheduling custom Java applications and web services connections extend the reach of the enterprise scheduler, offering detailed control and simplified access.

The scheduler can also manage process integration through the use of agents running at the OS level. Cisco TES supports many popular operating systems, including Microsoft Windows, UNIX, Linux, IBM z/OS, IBM OS/400, HP NonStop (NonStop Kernel [NSK]), and HP OpenVMS, and offers agentless adapters for Secure Shell (SSH) and Microsoft Windows systems.

Increasingly, businesses are using workload scheduling and batch-process automation technologies to integrate the business operations of their partners and customers. Cisco TES simplifies interenterprise data exchange through a powerful, script-free solution for file transfer, including FTP, SSH FTP (SFTP), and FTP SSL (FTPS). Database activities and process steps can also be automated in Microsoft, Oracle, or any Java database connectivity (JDBC) - compliant database environment, with process steps even running on various enterprise data warehouse appliances.

Big Data and Business Intelligence

From data collection to storage, retrieval, analysis, and reporting, business processing depends on the capability to move data between systems and applications both inside and outside your company. For many years, advances in infrastructure and operations solutions kept pace with the growing amount of data. But with the accelerated growth of unstructured data such as voice, text, and video, traditional data analytics solutions have broken down. Today's challenge is to accurately manage vast amounts of data, quickly moving it into and out of new big data processing applications such as Hadoop.

Cisco TES provides a comprehensive platform on which to manage business intelligence solutions and offers detailed management of big data applications. Cisco TES offers a Hadoop adapter that allows detailed control over data loading and flow management (Sqoop and Data Mover), Hadoop core data processing (MapReduce), and the data interface layer (Hive) that allows input of SQL-like data query and analysis commands. The value of using the Cisco Tidal Enterprise Adapter for Hadoop is that it allows you to define, schedule, and manage Hadoop jobs with multiple layers of dependency mapping and nesting of parent and child jobs, drop-down parameter selections, highly specific alerts and automated job rerun functions, resource awareness for workload prioritization, and predictive analytics to eliminate SLA delivery guesswork.

The Cisco scheduler can define and run Data Mover jobs for MapR, Cloudera, and Apache Hadoop. Connect to a Hadoop instance and define workloads as you would any other in your job stream. For all Cisco TES Hadoop jobs, the job tracker and task tracker process the jobs as they would any other Hadoop job, eliminating the overhead required to manage multiple schedulers, handle static scripts, and manually run complex workflows without the benefit of audit trails or dependency mapping.

Cisco TES is also well suited to managing data integration (extract, transform, and load [ETL]), database, and enterprise data warehouse workloads and the report generation and delivery tasks that comprise integrated business intelligence (BI) solutions. The scheduler supports IBM Cognos Business Intelligence, SAP Business Information Warehouse (BW), SAP BusinessObjects, and Informatica out of the box with complex API integrations for each. Each interface has been carefully developed and tested to work transparently with each application. Combining these third-party application partnerships with Cisco's WLA solution has the added benefit of providing a low-risk path to transition big data experimental projects from rogue IT to your process-based data center test and production environments.

Management of Physical, Virtualized, and Cloud Resources

As information increasingly floods your data center and IT budgets and resources are tightened, managers and administrators are seeking ways to control costs and to make the job of managing day-to-day operations easier. Cisco TES enables IT staff to define and schedule workloads in ways that adhere to strict infrastructure resources governance. Cisco TES allows for the prioritization of jobs, job groups, and entire business-critical workloads. It can also configure individual servers and processing resources to allocate the necessary resources to meet SLAs on time. And if unplanned jobs are introduced or unforeseen environmental events arise, Cisco TES can adjust capacity using its adapters for virtualized computing resources to manage public cloud processing and storage resources.

IT is moving increasingly toward virtualization and decoupling of the core, OS, and application stacks, whether inside the company firewall or outside in public cloud environments. Cisco TES is an excellent solution for automating the management of these computing environments. The scheduler can automate the tasks performed by specific virtual machines within the firewall as well as manage Cisco Unified Computing System™ (Cisco UCS®) servers, VMware instances, and Amazon Web Services (AWS) instances and storage buckets, and the data movement in and out of these cloud resources.

Cisco Tidal Enterprise Adapter for UCS Manager can bring up additional servers to meet workload bursts and shut them down when high-need workloads are complete, reducing the burden on the infrastructure management team to field requests for provisioning and decommissioning. Cisco TES can also help the infrastructure teams manage scheduled server maintenance windows. Using Cisco TES agents, Cisco UCS customers can now build complete server maintenance workflows and trigger them according to the maintenance window (calendar) defined in the scheduler.

Cisco Tidal Enterprise Adapter for VMware makes it possible to perform a wide array of management tasks on hypervisors using the VMware vCenter server. You can power virtual machines on and off and suspend and resume their use, manage snapshots, adjust resources, and perform VMware vMotion activities. All these activities can take place as individual jobs or grouped workloads according to business process demand. This unique capability makes it possible for the state of a virtual environment to be balanced and optimized, helping guarantee performance and resource availability for essential business process steps.

Cisco Tidal Enterprise Adapter for AWS gives you the capability to automate these public cloud resources. Managed Amazon Elastic Compute Cloud (EC2) resources include start, stop, and delete instances and Amazon Machine Images (AMIs) and Elastic Block Store (EBS) volumes. Cisco TES also allows the management of Amazon Simple Storage Service (S3) storage buckets and data copy and move processes.

Cisco offers many cloud and IT process automation (ITPA) solutions, which act as abstraction layers between the data center components and the requestor. Cisco TES can interact with both Cisco Intelligent Automation for Cloud (IAC) and Cisco Process Orchestrator, which can then deliver fully functional infrastructure or application and database stacks on demand. Contact Cisco Services for more information about how Cisco can help your enterprise move toward a truly automated workload management solution.

Intuitive User Interface: Browser Based, Java Client, and Mobile App

Cisco TES provides intuitive browser-based and Java user interfaces that deliver all aspects of administration, definition, and operation of the schedule through a single pane. Job creation, stop and start, calendaring, fallback, and event dependency mapping can all be achieved within this interface, which has the same look and feel as in previous versions of the product. From a single console, users can view the workloads for past, current, and future job runs in real time, allowing disparate systems to be centrally managed without scripts. Out-of-the-box integrations also support a remotely accessible command-line interface (CLI) for UNIX, Linux, and Microsoft Windows systems.

For power users who are managing thousands of workloads and associated objects in their databases, the Java client syncs data directly from the primary, but it is many times faster than the client manager because all data is stored in memory on the Java virtual machine rather than to an external database. The performance of many interactions through the Java client will increase, providing, for example, smooth scrolling with zero latency and faster searches and filtering.

The scheduler's iPhone and iPad mobile app also provides control capabilities, allowing override, hold and stop, and release and resume commands. Mobile management capabilities also include the capability to filter and view adapter and agent connections, jobs, alerts, events, schedules, queues, and logs.

Because the enterprise scheduler management tools are accessible through a browser and security access is managed by Lightweight Directory Access Protocol (LDAP) and Microsoft Active Directory integration, control of specific processes can be quickly distributed to various workgroups and individuals in the data center. Control can even be given to business unit IT managers for self-service job planning and implementation.

Self-Service Management

Now you can eliminate the need for 24-hour staffing to accommodate a business unit manager's impromptu request to change, cancel, or delay the running of a business process. You can deliver higher service levels to your business end users without the need for them to escalate job insertions or changes to IT for such requests.

Cisco Prime™ Service Catalog for TES (Figure 3) gives business users and IT administrators continuous controlled access to approved services without the need to allocate additional IT staff. Business users manage jobs and receive services without IT involvement and without the need for specialized skills because the processes and complexity are abstracted through a user-friendly web portal.

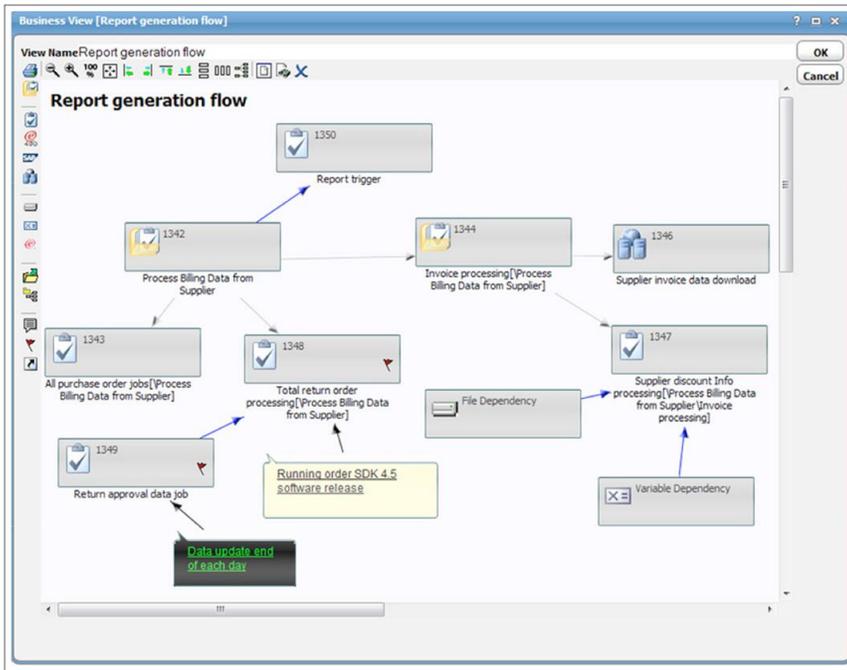
Figure 3. Self-Service Scheduling with Cisco Prime Service Catalog for TES



Business Views

Alignment of IT with business goals is critical to the successful development and delivery of SLAs. To accomplish this, IT must understand how specific workflow tasks relate to an overall business process. The enterprise scheduler supports this understanding through its business views (Figure 4). These views graphically display the tasks included in a business process, their dependencies, and their status. Using business views, IT staff can define, understand, and control not only individual job steps, but also the overall workflow process. Business views can also be used to show business unit managers exactly what will be delivered based on the SLA.

Figure 4. Graphical Business View for Displaying the Tasks in an Entire Business Workflow



Enterprise-Class APIs

The enterprise scheduler provides a comprehensive set of APIs that allows access to core scheduling and operation activities. These APIs are provided as a set of representational state transfer (REST) and Web Services Description Language (WSDL) access methods. These APIs are exposed from the enterprise scheduler client manager, making them scalable and capable of delivering peak performance even under heavy workloads. In addition, they are designed to support transparent failover using the same approach as for all other application interaction points.

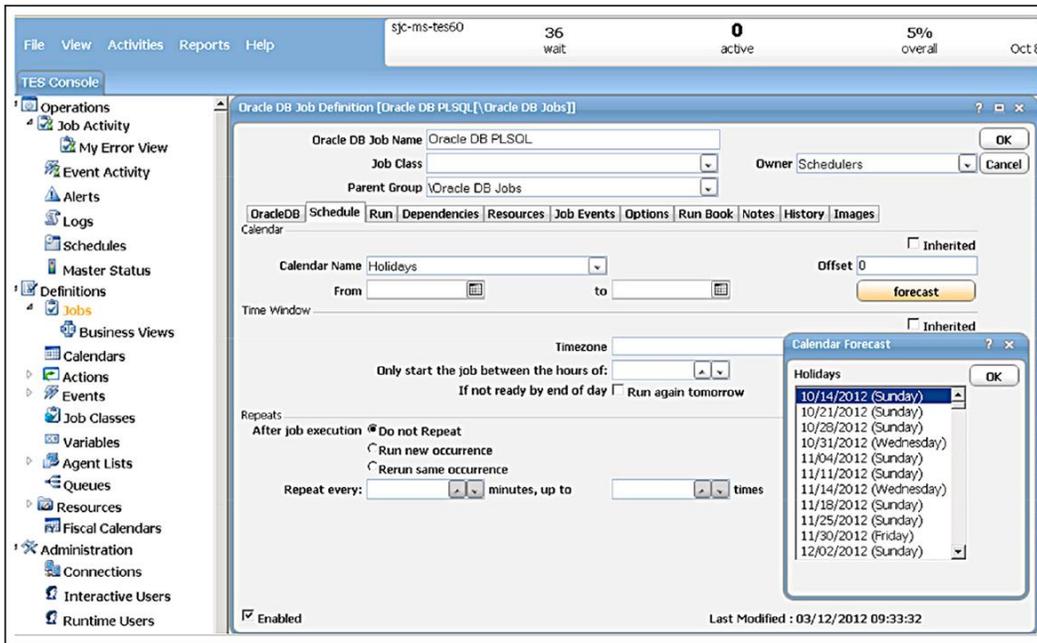
Comprehensive Calendaring

The enterprise scheduler delivers multiple preconfigured calendars and also permits calendar combinations that meet specific date-based business requirements. It can support rules that govern complex scheduling needs based on a hierarchy of dependent calendars, including the capability to manage calendars configured to accommodate global workdays, holidays, and unplanned date dependencies.

The enterprise scheduler is delivered with workday and financial calendars that can meet the most complex processing needs. When users need to modify or make an impromptu change to a calendar, these changes can be made dynamically without requiring the schedule to be recompiled. These new custom calendars can be saved for future use.

Enterprise business processes are often global, with various steps of the process running in different parts of the world with different time zones. Cross-time-zone scheduling is a factor because modern businesses operate in multiple theaters and must be aware of time-zone idiosyncrasies, such as Daylight Savings Time changes at irregular intervals. Cisco TES can account for these situations and allows the user to specify the time zone on a per-job basis (Figure 5), helping ensure that a job will be launched correctly no matter where the job resides.

Figure 5. Defining Job Schedules Based on a Variety of Preconfigured Calendars



Event-Based Processing

In addition to performing calendar-based scheduling, the enterprise scheduler can dynamically introduce jobs - and entire complex workloads - into a schedule when the job is initiated by business or system events from a wide range of application adapters and platform-supported agents. The scheduler's capability to respond to these events removes latency from workloads.

The enterprise scheduler provides script-free support for event-based scheduling. Events supported include the following:

- Job triggers (such as system events, exit codes, and jobs that run longer than expected)
- File arrivals and changes
- Database changes (without requiring creation of database triggers)
- Email
- Simple Network Management Protocol (SNMP)
- Variables (managed internally or externally)
- Enterprise applications, business intelligence, data integration, and enterprise data warehouses

Flexible Monitoring and Alerting

To simplify alert management, the enterprise scheduler also offers a specialized alert console that allows users to see all defined alerts within the scheduling system, view their status, and manage their behavior. It can also send alerts to browser-enabled devices for anytime, anywhere status delivery.

The scheduler can alert users to a wide variety of events, often acting in conjunction with the capability to configure autorecovery steps. If a job fails, the enterprise scheduler can initiate a recovery action, send an email to the appropriate owner, generate a message to the central console, and trigger an incident report to an IT support technician through the appropriate ITIL-based operations systems. Ease of use and flexibility are primary features, as well as the capability to generate specific alerts without the need for custom scripts.

Comprehensive Security and Audit Capabilities

The enterprise workload scheduler offers detailed security management through comprehensive LDAP and Active Directory integration. Security policies (and their controls) are tied to enterprise security management tools and processes. Cisco TES lets administrators control access to scheduling functions as a whole or to specific jobs, events, or actions on an individual user or workgroup basis.

To further support alignment with enterprise security management policies and processes, the enterprise scheduler creates audit trails that allow operations personnel to monitor and control the scheduling environment: a crucial requirement in today's rapidly changing production and regulatory environments.

Reporting and Analytics

Informed decision making about the performance of business processes is a major concern in today's complex IT environments. Efficient management of complex workloads and enhanced accuracy and reliability of job processing have significant positive effects on an organization's capability to meet business demands.

Business managers, IT executives, operations managers, and front-line staff all need ongoing access to timely and accurate information to understand the performance of their scheduling environments and to comply with IT policy and audit requirements. Cisco TES delivers out-of-the-box reporting features that provide insight into the enterprisewide scheduling environment through in-depth historical data. This data helps IT managers develop strategies to improve scheduling performance.

In addition to its detailed native reporting features, Cisco TES integrates with Terma Labs JAWS Historical and Predictive Analytics. You can get historical, real-time, and predictive job-run analysis to help IT staff gain greater visibility into the performance of the workload automation environment and the SLAs that govern the delivery of business processes. Rapid access to accurate job stream reports and critical-path analytics can help IT detect problems proactively so that service levels are not compromised. The insight that these sophisticated analytics modules provide supports the auditing and compliance processes and promotes new strategies to help improve SLA delivery.

Reduced Total Cost of Ownership

For most IT departments, total-cost-of-ownership (TCO) analysis is now mandatory when making new project decisions. Reduced cost of ownership of existing capital and operating resources through increased efficiency and higher use rates is a key performance indicator (KPI). The enterprise scheduler delivers outstanding benefits in the following categories, making it possible to meet internal SLAs on a more consistent basis and reduce overall TCO:

- Integrated solution design: Allows operations to be in production in days through components that install quickly and work together transparently
- Broad coverage: Simplifies scheduling and management of jobs in enterprise wide, heterogeneous environments, even when some jobs are outside the firewall
- Swift notification and recovery capabilities: Reduces downtime from hours to minutes

- Automated analysis: Supports management of complex dependencies and helps users quickly resolve workflow bottlenecks with detailed analytics

Companies in a variety of industries rely on Cisco TES to keep their daily operations running smoothly. The enterprise scheduler, combined with Cisco's cloud and infrastructure provisioning and management solutions, can deliver even greater levels of automation and optimization to the data center than conventional scheduling tools.

Main Features

Table 1 summarizes the main features of Cisco TES

Table 1. Cisco Tidal Enterprise Scheduler Features

Feature Summary
<ul style="list-style-type: none"> • Distributed, multitier architecture • Easy-to-use management interface • Fault tolerance and high availability • Scalability to handle both departmental and enterprisewide workloads • Cross-platform, cross-application scheduling and dependency support • Single view for enterprisewide workflow automation • Optimization for high-volume processing in centralized or virtualized computing environments • Workload balancing of the processing environment for detailed resource management • Private, public, and hybrid cloud processing and storage management • Transparent integration with major business applications and support for scheduling across a wide range of big data, business intelligence, data warehouse, and data integration environments • Capability to define and run jobs on Java Message Service (JMS) and in Simple Object Access Protocol (SOAP) and REST-based web services environments • Integrated FTP, SFTP, and FTPS scheduling support • Web-based, Java client, mobile app, and CLI user interfaces • Sophisticated business calendar and event processing • Nested schedules to manage the dependencies in a long sequence of tasks • Capability to design and run jobs without the need to manage scripts or multiple development tools • Role-based security integrated tightly with LDAP and Active Directory • Historic and predictive analytics

Major Requirements

Although planning and sizing are straightforward, actual requirements vary by enterprise, depending on the environment and type of coverage you need. You can easily obtain specific requirements information after an initial conversation with a product expert. The enterprise scheduler can be installed and deployed by users, by engaging Cisco Services, or by contacting one of our implementation partners.

For More Information

- Workload automation solutions: <http://www.cisco.com/go/workloadautomation>.
- Solutions for data center applications and big data: <http://www.cisco.com/c/en/us/solutions/data-center-virtualization/data-center-applications/index.html>.
- Integrated systems and cloud management: <http://www.cisco.com/c/en/us/solutions/data-center-virtualization/unified-management/index.html#~products>.



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