IBM Tivoli Workload Automation
View, Control and Automate Composite Workloads

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IBM Tivoli Workload Automation
Tivoli Workload Automation is used by customers to deliver core business services

- Retailers use it to update pricing on Web sites, control inventory and replenish systems, transfer data, backup data, and control CRM and data warehouse systems

- Banks use it to process consumer and commercial transactions, provide online account services to customers, execute investment transactions, process back-end analytics and reports, and transfer and backup data

- Process and package food companies use it to schedule daily product runs, and to control inventory and deliveries

- Entertainment companies use it to schedule and load delivery trucks with media for distribution to the marketplace

- Healthcare providers use it to manage online services for customers and partners, to control back-end processes and backup data
IBM’s evolution from Scheduling to Workload Automation

- It isn’t just scheduling unattended batch jobs!
  - Service-oriented architecture with open interfacing for J2EE, Web Services and custom applications
  - Extended agents for packaged ERP, grid and z/OS systems
  - Integration with many Tivoli products for advanced services management and automation
- An enterprise backbone that drives composite workloads according to business policies while providing consistent visibility, control and automation
IBM’s evolution from Scheduling to Workload Automation

- **Tivoli Workload Automation**
  - Helps view, control and automate the entire process of delivering composite workloads across heterogeneous applications and systems

**IT Service Execution Process Activities**
(Formal ITUP / PRM-IT Flow)

- **Business strategy**
- **Service level agreements**
- **Create service schedules and plans**
- **Maintain service schedules and plans**
- **Deliver and monitor service schedules and plans**
- **Detect service execution incidences and events**
- **Manage resources and workloads, adapt delivery of service**
- **Measure, analyze and report performance**

Optimization Loop

- **Change Process**
  - Change Process
  - Storage Process
  - Continuity Process
- **Availability Process**
- **Continuity Process**
- **Capacity Process**

**Stand-alone requests**
Tivoli Workload Automation services

- Integrate Tivoli Workload Automation managed workloads with composite business services through SOA.
- Model and plan time-triggered workloads and policy-based event-triggered workloads.
- Choreograph composite workloads and resolve dependencies throughout heterogeneous infrastructures.
- Prioritize and broker workloads to best available resources.
- Consolidate management of all enterprise workloads while virtualizing heterogeneous IT infrastructures.
Tivoli Workload Automation components

- **Visibility**
  - Single, consistent view for monitoring, reporting and auditing

- **Control**
  - Centralized planning and management of mixed workloads
  - Service oriented architecture
  - High scalability

- **Automation**
  - Alerts and notifications
  - Fault tolerant and workload restart processes
  - Policy-based event triggering
  - Policy-based workload dispatching
  - Adaptation to changes and incidences in the IT infrastructure
Single point of control

Job Scheduling Console
- Drag-and-drop object-based planning and modeling
- Filterable views of all jobs and jobstreams including all dependencies

Dynamic Workload Console
- Monitor and manage
  - Exceptions-based monitoring
  - Monitor and tune workload throughput and performance
  - Take manual action
  - Trial forecasting
- Report production plans and performance
  - Standard reports (templates)
  - User-defined reports
  - Historical execution data and statistics
  - Audit reports for compliance
Mainframe workload automation

- **Tivoli Workload Scheduler for z/OS**
  - Environment: z/OS

- **View**
  - Centralized view of models, plans and production workloads
  - Integration with Tivoli Enterprise Portal and Tivoli Business Systems Manager

- **Control**
  - Centralized management of heterogeneous, composite workloads
  - Policy-based calendar-, time- and event-triggered planning and modeling
  - Highly secure and scalable

- **Automation**
  - Fault tolerant and workload recovery processes
  - Critical path analysis
  - Dispatching of workloads to best available resources
  - Integration with Tivoli Storage Manager to coordinate data backups with application workload events and plans
  - Integration with Tivoli System Automation to start, stop and move applications
New for Tivoli Workload Scheduler for z/OS V8.3 (4Q2006)

- Service oriented architecture
  - Open, published J2EE and Web Services APIs

- Graphical interfacing
  - Enhanced Java-based Job Scheduling Console for planning
  - New Tivoli Dynamic Workload Console, a web-based operations console for submitting and monitoring workloads, exceptions-based monitoring, recovering failing workloads or resources, and reporting

- Automation
  - Workload prioritization and promotion, critical path analysis, dynamic brokering

- End-to-end Workload Automation
  - Seamless and flexible integration with distributed components
  - New ability to connect z controllers directly to distributed agents
Critical path analysis

- Users are enabled to identify jobs that are critical for their business.
- At Daily Plan, TWS calculates the critical path to critical jobs.
- New views are provided to monitor Critical Jobs and their Critical Paths.
- Jobs are automatically promoted when they risk to miss their deadline.
- Internal priority for jobs in Ready status.
- WLM Service Class for Started jobs.
- WLM Service Classes will be specified at operation level.
Dynamic workload brokering

- TWS integrates with Workload Manager (WLM), leveraging Scheduling Environment (SE) and Service Class objects.

- New integration with WLM SE has been provided:
  - Dynamic routing of workload to MVS systems in the Sysplex based on best available resources.
  - SE becomes part of TWS operation.
  - SE availability status is checked before jobs submission.
  - Automatic re-submission of jobs at SE availability status change.

- Integration with WLM Service Class has been enhanced in TWS:
  - WLM Service class can be defined at TWS operation level.
  - Jobs will be promoted to the specified WLM Service Class if they are on the Critical Path.
Advanced data center automation

- Advanced data center automation provided through integration with IBM Tivoli System Automation
- New TWS z/OS user and programmatic interfacing dedicated to scheduling of SA commands according to plans
- Easy and intuitive way for TWS operators to use and issue SA commands
- Ability to start/stop/move applications and resources in a controlled fashion from within TWS
- Eliminates error-prone and time-consuming manual efforts to schedule SA commands via batch or command interfaces
- Greater visibility and control of System Automation from within TWS
Distributed workload automation

- **Tivoli Workload Scheduler**
  - Environment: UNIX, Windows, Linux, i5/O5

- **View**
  - Centralized view of models, plans and production workloads
  - Integration with Tivoli Enterprise Portal and Tivoli Business Systems Manager

- **Control**
  - Centralized management of heterogeneous, composite workloads
  - Policy-based calendar-, time- and event-triggered planning and modeling
  - Highly secure and scalable flat or hierarchical topology

- **Automation**
  - Fault tolerant and workload recovery processes
  - Event filtering and automation engine
  - Integration with Tivoli Storage Manager to coordinate data backups with application workload events and plans
  - Integration with Tivoli System Automation to start, stop and move applications
Secure, highly scalable flat or hierarchical topology

- TWS provides extremely flexible hierarchy to suit a wide range of business goals and requirements

- Ability to leverage localized processing
  - Geographic locations / time zones
  - Organizational business functions or application groupings
  - Platforms
  - Virtual environments or physical servers
  - Network traffic
  - Network and node level fault tolerance for business resiliency
New for Tivoli Workload Scheduler V8.3 (2Q2006)

- **Service oriented architecture**
  - Built on WebSphere and DB2 (Oracle is optional)
  - Open, published J2EE and Web Services APIs

- **Graphical interfacing**
  - Enhanced Java-based Job Scheduling Console for planning
  - New Tivoli Dynamic Workload Console, a web-based operations console for submitting and monitoring workloads, exceptions-based monitoring, recovering failing workloads or resources, and reporting

- **Networking and security**
  - Full firewall support for secure, reliable execution when a firewall exists between domain managers and agents
  - Protection of TWS environments by configuring TWS domains and interfacing to use SSL to authenticate workstation identity
  - Centralized or decentralized user security and authentication models
New for Tivoli Workload Scheduler V8.4 (3Q2007)

- Policy-based event automation engine
  - Event monitoring, filtering and triggering of workloads
  - No scripting!

- Trial and forecast planning through the Dynamic Workload Console

- Agent-less technology

- LDAP and IPv6 support

- Reporting enhancements
  - DB2 historical repository
  - More templates
  - Greater ability to customize

- TWS – TDWB user interface single installer

- Integration with Tivoli Enterprise Portal
ERP system workload automation

- Tivoli Workload Scheduler for Applications
  - Environment: UNIX, Windows, Linux, z/OS

- View
  - Plan, model and track heterogeneous, composite workloads

- Control
  - Extend Tivoli Workload Scheduler automation capability to ERP and non-natively supported systems
  - Submit and restart SAP workloads through Tivoli Workload Scheduler

- Automation
  - Fault tolerance, workload recovery and load balancing
  - Resolve dependencies between SAP and non-SAP workloads
New for Tivoli Workload Scheduler for Applications V8.3 (3Q2006)

- SAP certification to provide full integration from the TWS Job Scheduling Console and Tivoli Dynamic Workload Console
- New SAP-specific panels in the Job Scheduling Console to create, modify and delete SAP jobs
- Monitor and manage SAP jobs whether created in SAP or in TWS
- Enhanced monitoring, tracking and restarting of SAP jobs
- Enhanced ability to intercept SAP jobs not defined in TWS to ensure they are launched at optimal times
- Enhanced parent-child feature to monitor and track instances when an SAP job spawns other jobs
- Manage and resolve interdependencies between SAP and non-SAP environments
- Extended platform support for Oracle and PeopleSoft extended agents to Solaris and HP-UX
New for Tivoli Workload Scheduler for Applications V8.4 (2H2006)

- Submit SAP workloads through Tivoli Workload Scheduler
- Automatic updates to SAP calendars
- Monitoring and filtering of SAP events, trigger SAP and non-SAP workloads based on application and system events
- Alert notification based on SAP and non-SAP events
- Load balancing for SAP workloads
- IPv6, FIPS 140-2 standards
Distributed dynamic workload brokering

- **Tivoli Dynamic Workload Broker**
  - Environment: UNIX, Windows, Linux

- **Stand-alone product**
  - Add-on product to Tivoli Workload Scheduler
  - Users, applications and application servers can also submit workloads directly

- **Policy-based dispatching**
  - Matches workload requirements, priorities and attributes to IT resource attributes, performance and availability
  - Policy-based IT resource utilization
  - Automatic discovery of configuration changes

- **Advanced automation**
  - Integrated with Tivoli Provisioning Manager to provision resources on demand
  - Integration with Tivoli CCMDB to map Workload Automation into formal IT management processes
New for Tivoli Dynamic Workload Broker V1.1 (4Q2006)

- Manages the matching and dispatching of workloads to best available resources
  - Based on workload requirements, resource performance and attributes and business policies
  - Physical resources
  - Logical resources

- Optimizes the utilization of IT resources based on user-defined policies
  - Enable maximum throughput of high priority workloads when multiple workloads are competing for limited resources
  - Physical and virtual memory size and utilization
  - CPU architecture, quantity, speed and utilization
  - Operating system type and version
  - Logical resources
  - File systems required for running workloads

- Enables user-defined optimization objectives including minimums, maximums and exact values

- Provides automatic discovery and integration of newly added resources into the workload matching pool
New for Tivoli Dynamic Workload Broker V1.2 (2Q2007)

- Platform coverage extended to Solaris, HP-UX
- Option to install Oracle database
- Enhanced audit logging for easier report generation for compliance
Tivoli Workload Automation in an end-to-end environment

- Centralized planning, monitoring and control of end-to-end environments
- Mainframe-centric, distributed-centric or mixed-mode management
- Consolidate management of Java application, Web Services, ERP system workloads and data backups
- Provide higher level exceptions monitoring
- Provide composite business service monitoring according to key performance indicators
- Provide higher level event correlation
- Provide provisioning on demand
- Start, stop and move resources on demand
- Higher level event-triggering
- Map and integrate Workload Automation into formal IT management processes
Tivoli Workload Automation value

- Automatically manage composite workloads
  - Policy-based execution of workloads while resolving all mixed workload dependencies across heterogeneous IT resources

- Automatically execute services to meet contracted levels
  - Policy-based event filtering and triggering of workloads

- Automatically manage and adapt to planned configuration changes
  - Identify configuration changes and incorporate into workload execution without manually updating plans and choreography

- Automatically adapt to unplanned incidences
  - Monitor workloads and IT resources by exception
  - Generate alerts
  - Restart failed workloads
  - Failover scheduling engine and domain managers with no loss of service or historical or in-flight data
  - Adapt service execution to unplanned incidences by relocating workloads to available IT resources without manually updating plans and choreography
Tivoli Workload Automation value (continued)

- Automatically shrink batch windows
  - High scalability and high performance Workload Automation infrastructure
  - Centrally monitor workloads and IT resources on exceptions basis, generate alerts
  - Automatic adaptation to unplanned incidences

- Automatically adapt to spikes in workload volumes
  - Employ policy-based resource utilization to avoid overloading or idling IT resources
  - Distribute workloads across available IT resources
  - Provision resources on demand (through integration with Tivoli Provisioning Manager or similar)

- Automatically manage virtualized infrastructures
  - Adapt to virtual configuration changes automatically without manually updating plans and choreography
  - Distribute workloads across available virtual resources based on availability, performance and policies
  - Provision virtual resources on demand (through integration with Tivoli Provisioning Manager or similar)
Tivoli Workload Automation value (continued)

- IBM vision, investment, commitment and support to
  - Elevate Workload Automation in strategic priority
  - Help to improve your ability to deliver reliable and scalable composite enterprise workloads and services
  - Help to reduce your administrative and operations expenses and complexity, and increase return on investment for existing IT resources