



**Tivoli.** software

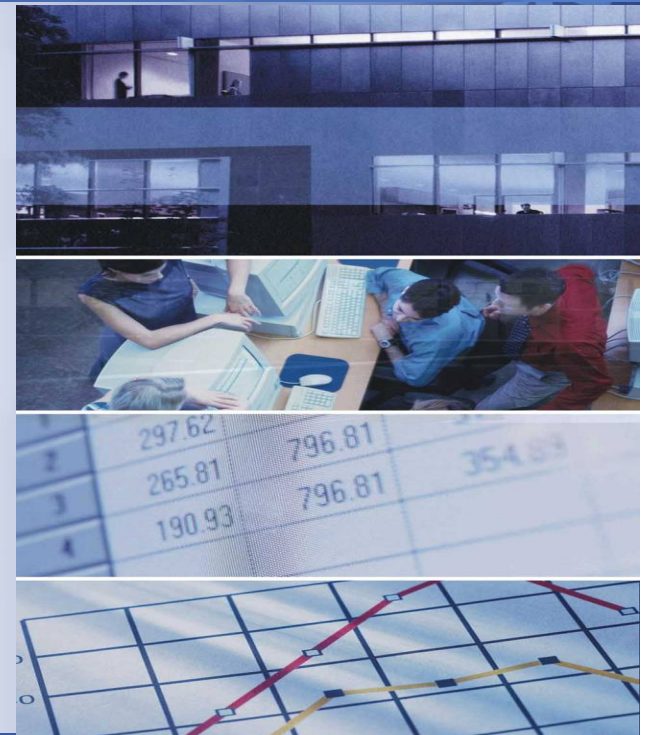
IBM Software Group – Tivoli Software

## IBM Tivoli Workload Automation

*Tivoli Workload Scheduler for z/OS  
latest updates*

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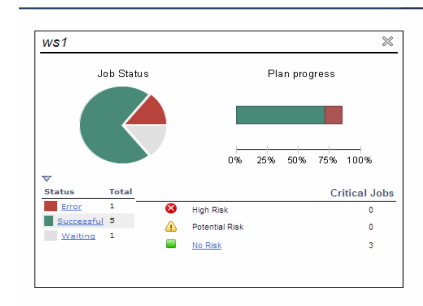
## Agenda

- *What's make IBM Tivoli Workload Automation unique*
- *Product evolution and latest IBM Tivoli Workload Scheduler for z/OS deliveries*
- *What's next for IBM Tivoli Workload Scheduler for z/OS*

## Predictable plans

*Would you feel comfortable to deliver services in production, without going through the test environment before?*

- **With Tivoli Workload Automation you can map unattended calendar-driven and event-driven workloads into precise, consistent, forecasted long term plans and objectives**
  - Long term plan and trial plan provide the unique capability to know beforehand the impact of your plan changes
- **Can you get comparable long term vision of your plans with other workload automation tools?**



## Proofpoints



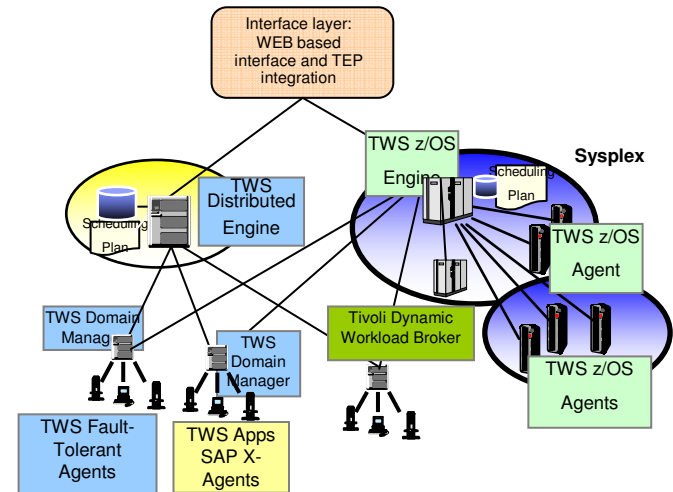
*Following a merge project, a French Government customer faced the challenge to consolidate to a unique vendor.*

*They consolidated to IBM, and one of the winning points was the TWA "predictability".*

# End to end

*Would you like to control your heterogeneous workload from a single point?*

- TWA family allows the deployment of flexible configurations to adhere to any organizational structure, and provides security, robustness, scalability, and centralized control
  - Centralized view is also provided through the modern web-based interface
- Can you accomplish close to what Tivoli portfolio provides with other vendors?



## Proofpoints

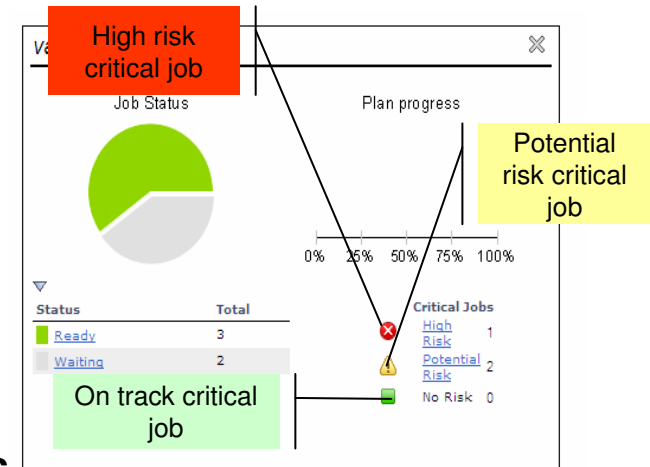


- Consolidation and shared services** *“Facilitated merger of operational units. Effective monitoring and management of nearly 3.8 million z/OS and 35,000 distributed jobs with one comprehensive scheduling environment.” – One of the largest IT service provider in Germany*
- 15%-20% reduction in costs**
- Single tool** *“A single tool that can accommodate a heterogeneous environment eliminates the need to maintain multiple technologies. This means lower software licensing costs and fewer, more efficient IT administrators” – Belgium Bank*
- Scalability** *Italian Bank run hundreds of thousands daily jobs on a single engine*

## SLA & Virtualization

*Are missing SLA costly to your organization? Are you getting the maximum amount of workload out of your resources?*

- **TWA Workload Service Assurance is a unique capability that ensures that critical workloads get the right priority and meet your SLA**
  - Unique promotion algorithm leveraging WLM that reduces the need for human intervention to a minimum
- **TWA Tivoli Dynamic Workload Broker is unique in implementing the IT infrastructure virtualization, dynamically dispatching jobs to best available resources**



## Proofpoints



*“Now, with Tivoli Dynamic Workload Broker, a **Pharmaceutical company** can easily adapt workload execution to incidences, problems and configuration changes, and automate key service execution steps—such as planning and modeling event- and time-driven workloads and resolve cross-workload and physical resource dependencies.*

*Additionally, with the ability to manage the entire workload through a single Web-based console, staff can easily see when jobs have failed and pinpoint the problem, which saves a great deal of time.*

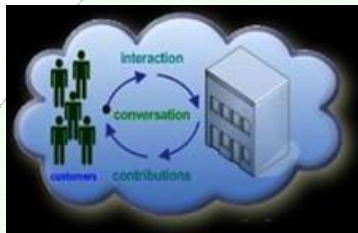
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# Industry drivers and Workload Automation challenges

**Automation  
Flexibility  
SLA and virtualization**

Policy-based and SLA-based execution services  
 Asset optimization and on-demand provisioning of resources - maximized resource utilization and minimized energy consumption  
 Business-driven service management  
 Cost reduction



**Labor cost control  
Underutilized systems**

**Abstraction levels  
Consolidation  
End to end**

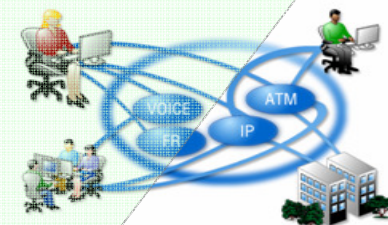
Componentized solution, innovation-ready  
 Integrated technologies, no boundaries of technical expertise  
 Single point for vision, control, automation



**Complexity growing  
Rapid IT changes  
Near realtime services**

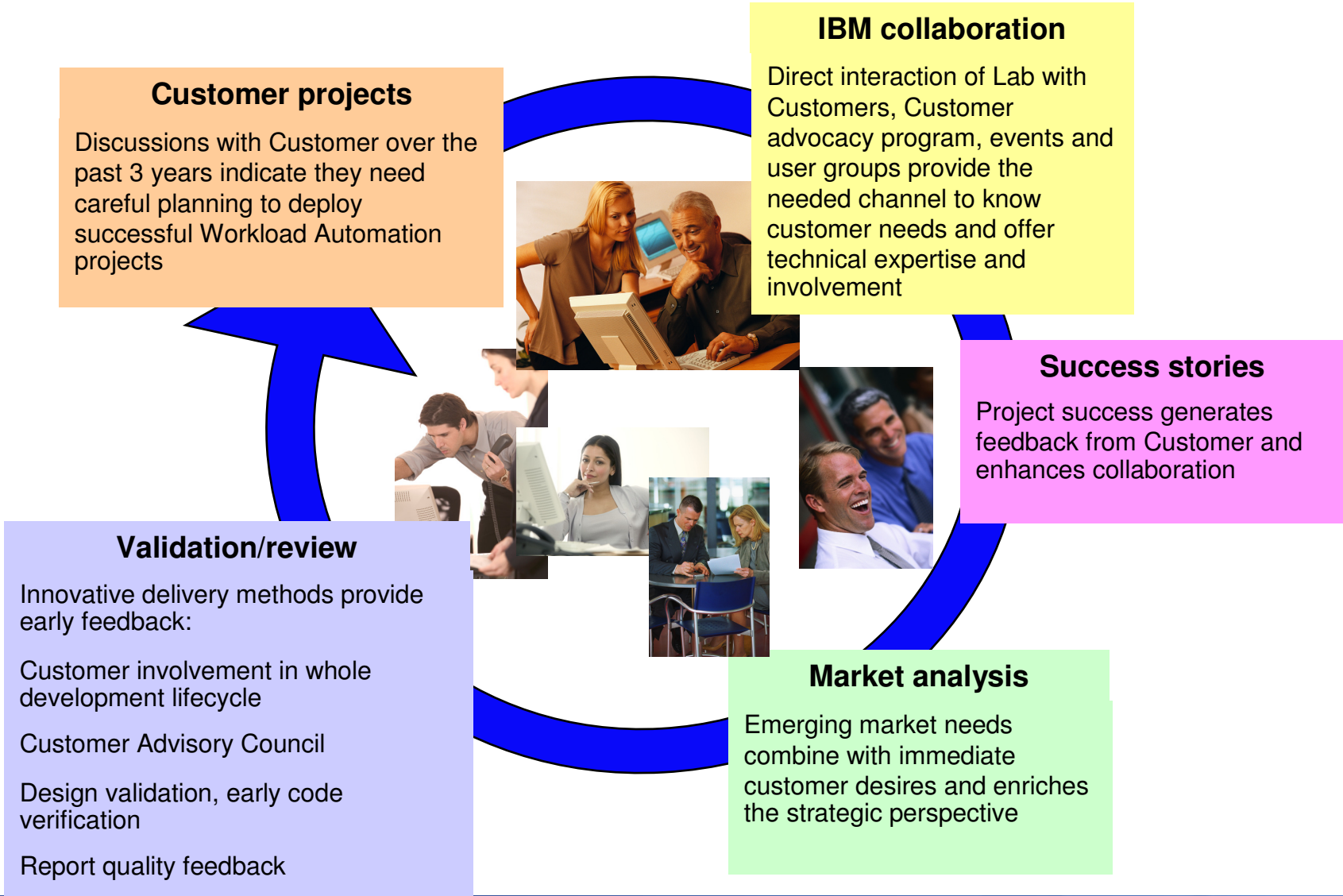
**New programming models  
Leveraging collective intelligence**

Adoption of new processes, applications, workloads, and technology  
 Collaboration across the IT organization by integrating service management process workflows with production service schedules



**Global collaboration  
Outsource / insource / rightsource**

# What's Driving Our Vision for Tivoli Workload Automation?





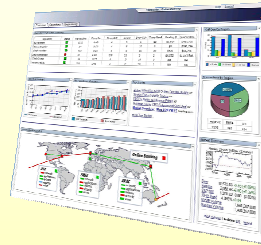
# Tivoli Workload Automation – recent investments

## *Increase automation*



- **Conditional dependency (V8.5, 2Q09)**
- **JCL Variables/Directives enhancements (v8.3+SPE, 3Q08)**

## *End-to-end and single point of control*



- **Tivoli Dynamic Workload Console (WebUI)**
- **Enhanced event management (v8.5, 2Q09)**

## *SLA and Virtualization*



- **Workload Service Assurance (v8.3+SPE, 1Q08)**

## Conditional Dependency (TWS z/OS v8.5)

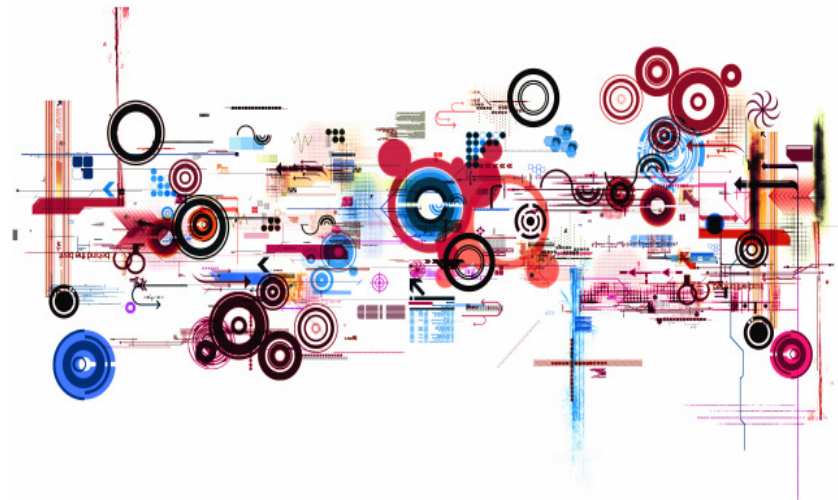
*Helps mapping **dynamic business processes**, increases the **automation and the self-recovery***

### Conditional Dependency abstract

- ▶ Possibility to define/monitor for a job complex conditions on predecessors Error Codes and/or Statuses

### Customer scenarios

- ▶ Model and monitor branches of workflows performing processes that depend on real-time conditions
- ▶ Implement self-recovery system, triggering automated processes to recover different error conditions



# Conditional Dependency details

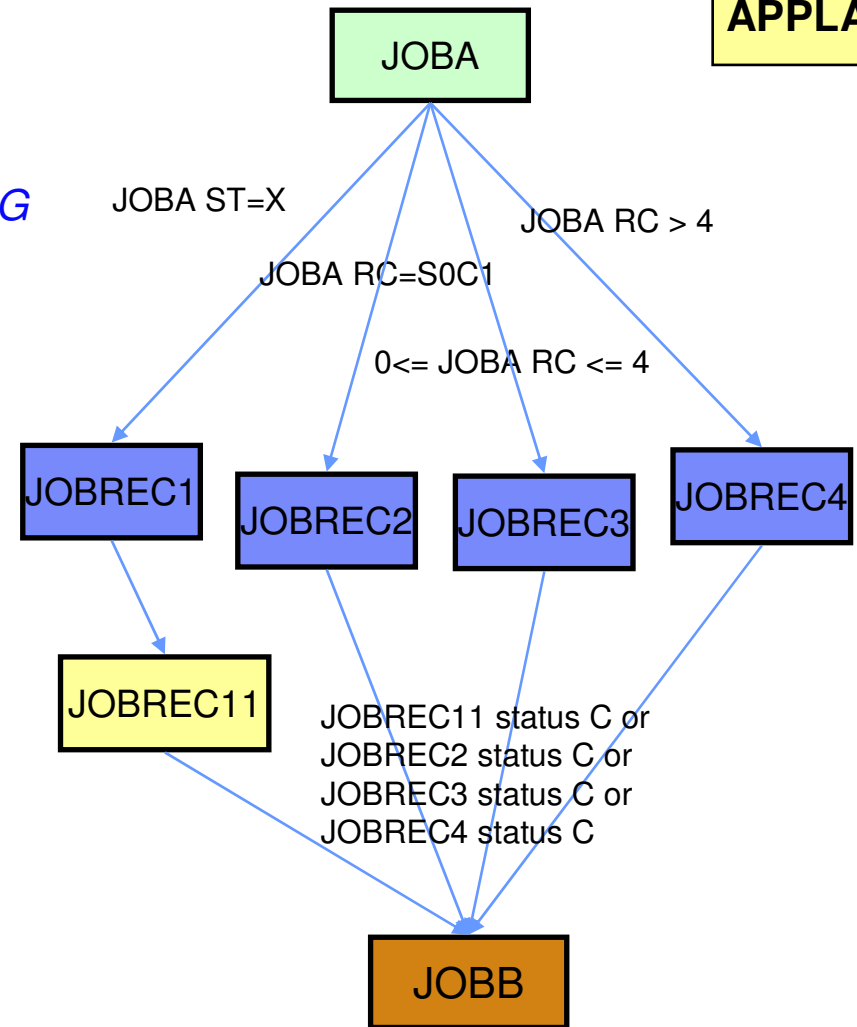
APPLA

**Defined in AD at operation level**

*Relational Operator*    *GE, GT, LE, LT, EQ, NE, RG*  
*Condition Type*        *RC : nnnn, Sxxx, Uxxx*  
*ST : S, C, E and X*  
*Rule*                      *AND, OR, n out of m*

**Mapped in the Plan**

*Created at Plan creation or dynamically added*  
*Can be modified before they get to a final status*



# Conditional Dependency details

APPLA

## Checked by Scheduler

Scheduler evaluates conditions at run time, and the status can be: *U (Undecided), T (True), F (False)*

Operations with condition dependencies change status among the following: *W (Waiting), R (Condition True), X (Condition False)*

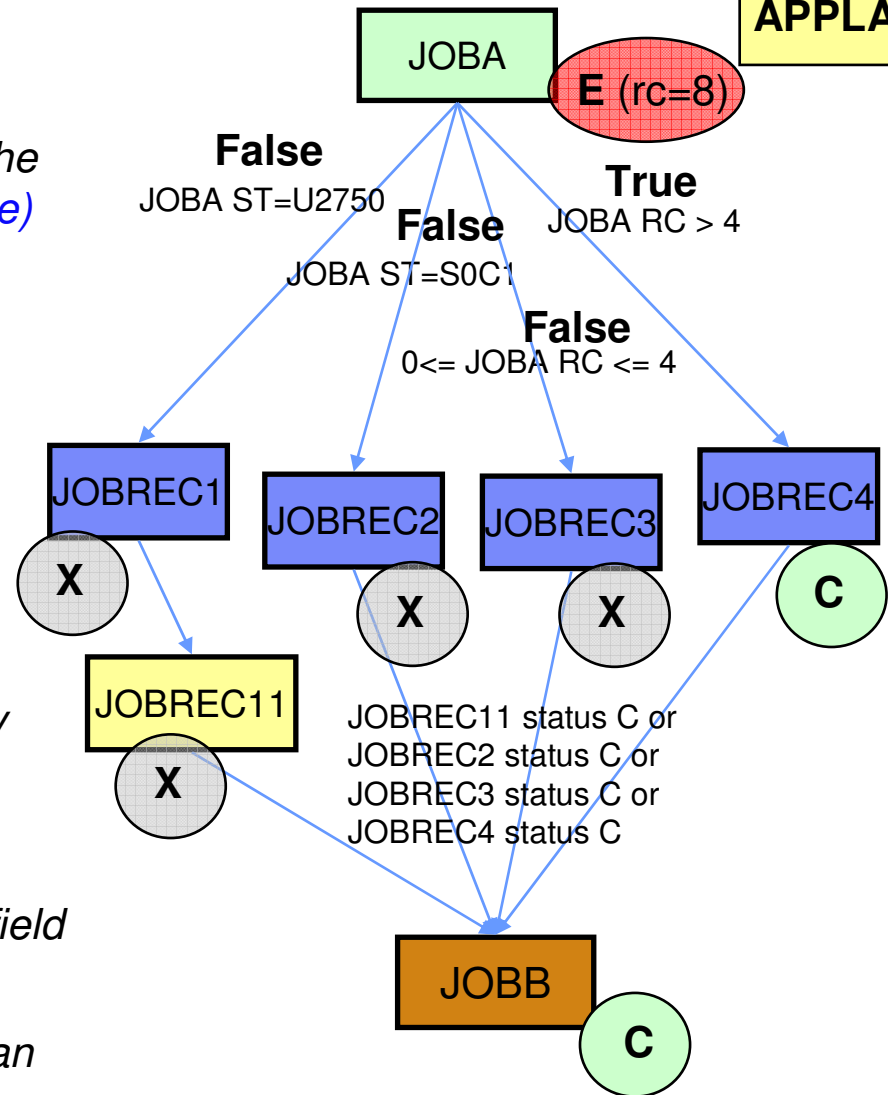
*X* status propagates to successors (unless a condition is defined on *X* status)

## Recovery option

If you want *JOBREC1...JOBREC4* to be recovery jobs, flag them with "COND RECOVERY JOB".

You will get:

- *JOB* has the *RECOVERY BY COND* output field set to *YES*
- *APPLA*, although in Error, is deleted at Daily Plan



## JCL Variables/Directives enhancements (TWS z/OS v8.3+SPE)

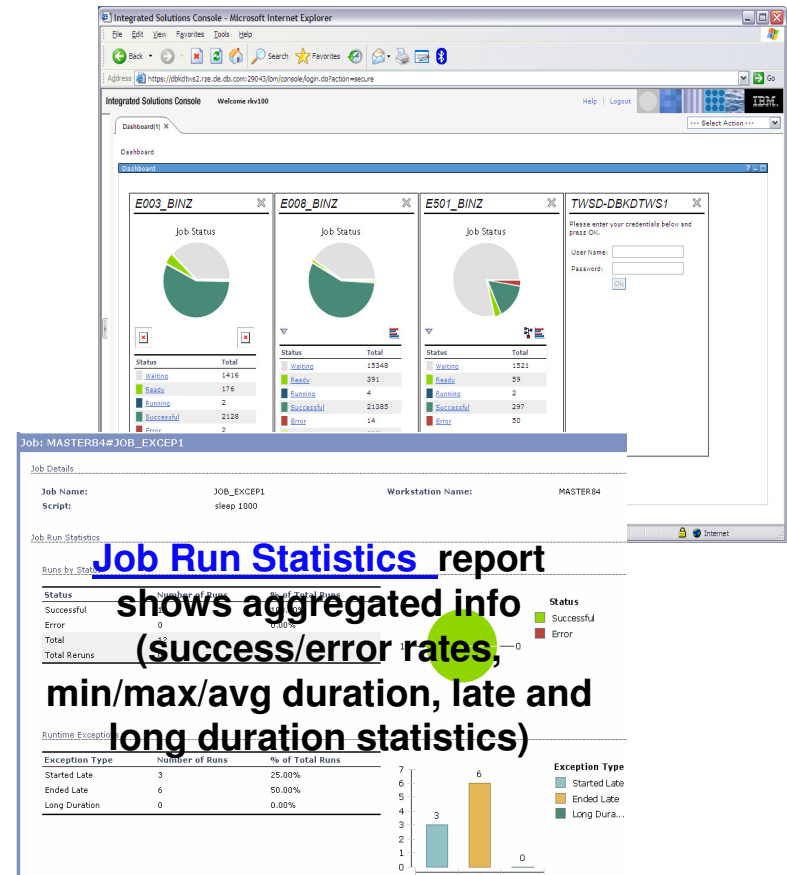
*Better manipulation of JCL variables and directive, to reduce maintenance effort in JCL lifecycle and facilitate migrations from competitors*

- ✓ Enhanced SETVAR directive
- ✓ Enhanced Dependent variables
- ✓ Optional removal of JCL directives
- ✓ NOP directive

# Tivoli Dynamic Workload Console

*Web-based single intuitive point of control for your enterprise workload, providing monitoring functions, with special focus on business critical workloads, modeling and reporting capabilities.*

- ▶ Free of charge component
- ▶ Reduced TCO. No need to install/maintain software on control machine, leverage of supported Browsers
- ▶ New concepts of tasks, dashboards, navigation, working areas for friendly control and management
- ▶ Coverage of all monitoring, ad-hoc submission, reporting, event management, workload service assurance and modeling functions (jobs, jobstreams, workstations, special resources)



## Enhanced event management (TWS z/OS v8.5)

*Easier way to schedule workloads triggered on z/OS files, and new dependencies on distributed and HFS files.*

### Enhancement abstract

- ▶ Alternative and easiest way to implement the data set triggering functionality
- ▶ Dependencies on Windows, AIX and HFS files

### Customer scenarios

- ▶ Consolidate daily reports through TWS z/OS gathering data provided with FTP'ed distributed files
- ▶ Simplify definitions of workflows tied to conditions on files



## Enhanced event management details

### Easiest data set triggering

- ▶ Alternative way to the acquired one, which uses assembler macro to edit/compile and places the data set triggering table on each system where the data set monitoring must be active
- ▶ Single centralized job to define event rules, produce configuration files and deploy them to all systems where data set monitoring must be active



### File dependencies

- ▶ File watcher utility enables reactions to file system changes of files and directories HFS, Windows and AIX
- ▶ Filewatcher runs until a specified deadline or condition is matched.

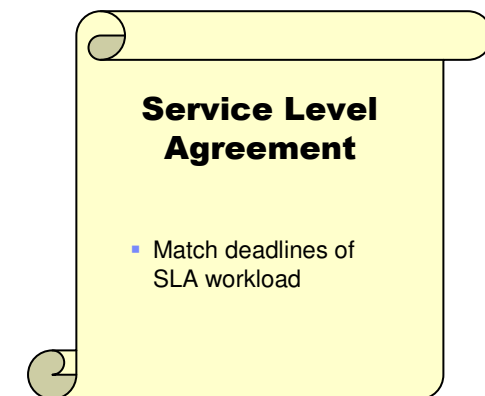


## Workload Service Assurance (TWS z/OS v8.3+SPE)

*Helps to ensure that **critical business workloads** are **completed by SLA deadlines**. **Automatic prioritization and proactive enablement of human reaction***

### Workload Service Assurance abstract

- ▶ Automatic and dynamic determination of critical paths to critical jobs, autonomous speed up of delay jobs and proactive monitoring of risk level and workload progresses



### Customer scenarios

- ▶ In a credit card transaction the bank must debit holder's account in a very narrow window of time. Services implementing this process cannot be delayed without dramatically impacting all following transactions.
- ▶ Services, whether in-house, contracted or outsourced are usually subject to Service Level Agreements (SLAs). SLAs failure may become a failure in the service delivery chain, with potentially disastrous impact and loss of million of dollars in minutes

# Workload Service Assurance details

## Identification of critical jobs

- ▶ User flags critical jobs, that is jobs that must match their deadlines

## Critical paths determination

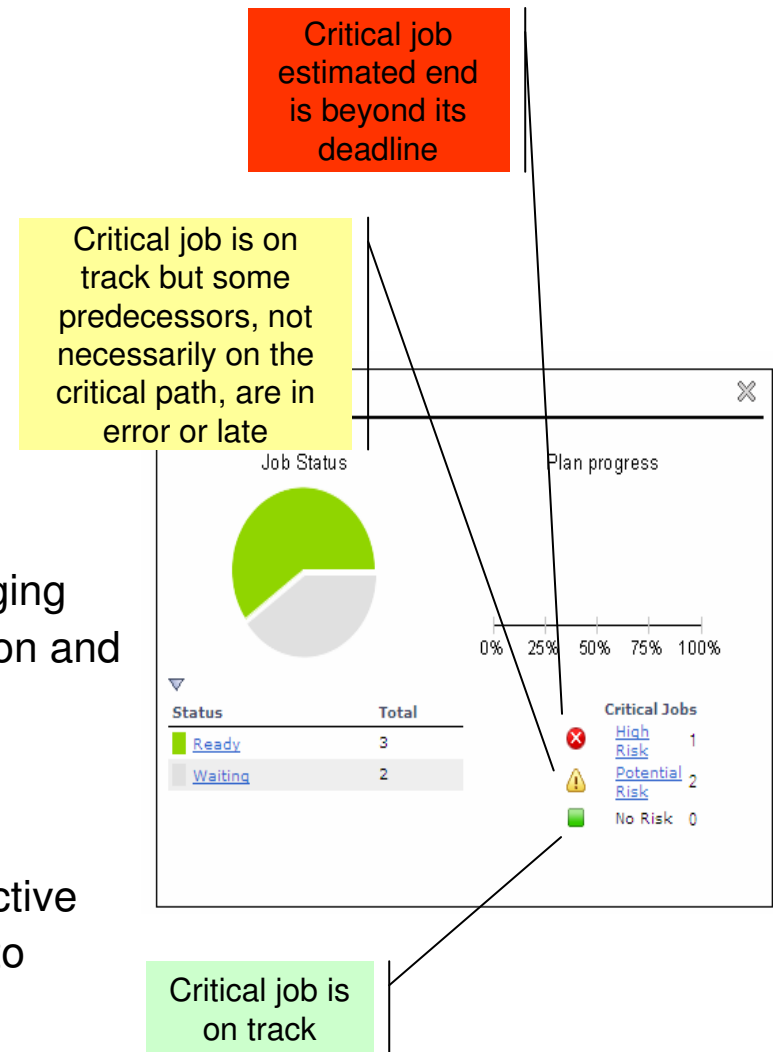
- ▶ Product calculates critical paths to critical jobs and keep them dynamically updated

## Autonomous promotion

- ▶ Product takes autonomous remedial actions for lagging jobs in the critical path (priority flag for job submission and WLM Service Classes)

## Proactive monitoring

- ▶ Color-coded view of critical jobs risk level and proactive monitoring view (how well workload is progressing to reach end points) to enable timely human reaction



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## What's next



### ■ What we want to accomplish

- ▶ *Simple, flexible*, E2E solution for *any* kind of *configuration*, performing *any function* from *any point of control*, with *minimum TCO*



- ▶ Simple deployment, configuration and operation
- ▶ Support customers e2e evolution and movements e2e workloads
- ▶ Further facilitate workload management through intuitive and modern graphical interface



धन्यवाद

Hindi

多謝

Traditional Chinese

ขอบพระคุณ

Thai

Спасибо

Russian

Gracias

Spanish

Thank

English

شكراً

Arabic

You

Obrigado

Brazilian Portuguese

Grazie

Italian

多谢

Simplified Chinese

Danke

German

Merci

French

நன்றி

Tamil

ありがとうございました

Japanese

감사합니다

Korean