Tivoli Workload Automation family

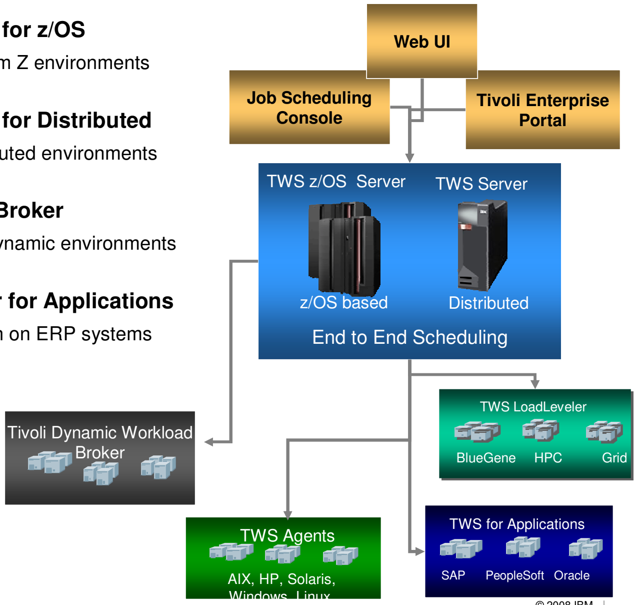
Improving IT efficiency, performance, and costs
to accelerate and sustain business growth

Agenda

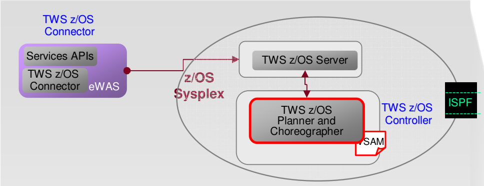
- Tivoli Workload Automation family
  - Components
  - End-to-End solutions
  - SAP in End-to-End
- Visualize, Control, Automate paradigm
- Key Workload Automation features
  - Plan driven workload automation
  - Workload planning, forecasting, reporting and compliance
  - Dynamic workload optimization and virtualization
  - Centralized and proactive workload monitoring
  - Event driven workload automation
  - Integrations in service management landscape
- Latest and next updates
- TWA evolution strategy

Tivoli Workload Automation products family

- **Tivoli Workload Scheduler for z/OS**
  – Controls scheduling on System Z environments
- **Tivoli Workload Scheduler for Distributed**
  – Controls scheduling on distributed environments
- **Tivoli Dynamic Workload Broker**
  – Runs and balances jobs on dynamic environments
- **Tivoli Workload Scheduler for Applications**
  – Provides workload automation on ERP systems



TWS z/OS Scheduler

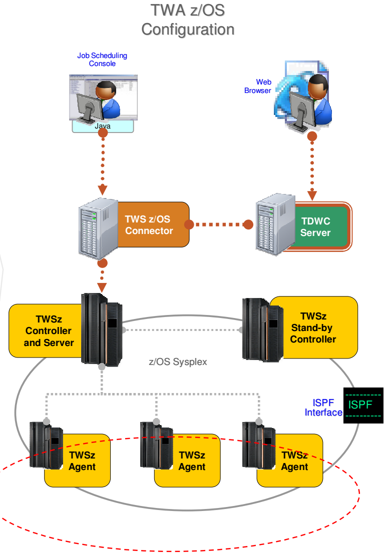


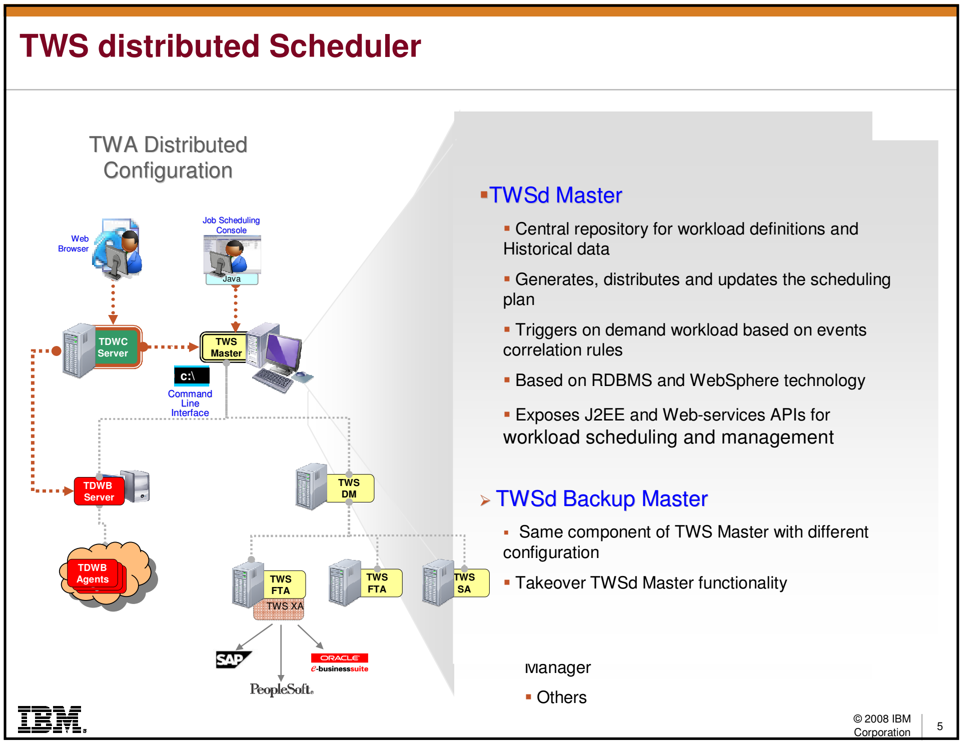
- **TWS z/OS Controller**
  - Central repository for workload defs and Historical data
  - Generates and updates the scheduling plan

nplanned events

- **TWS z/OS Agents**
  - Driven by TWS z/OS Controller
  - Tightly integrated with JES and SMF
  - Parallel Sysplex support

troller



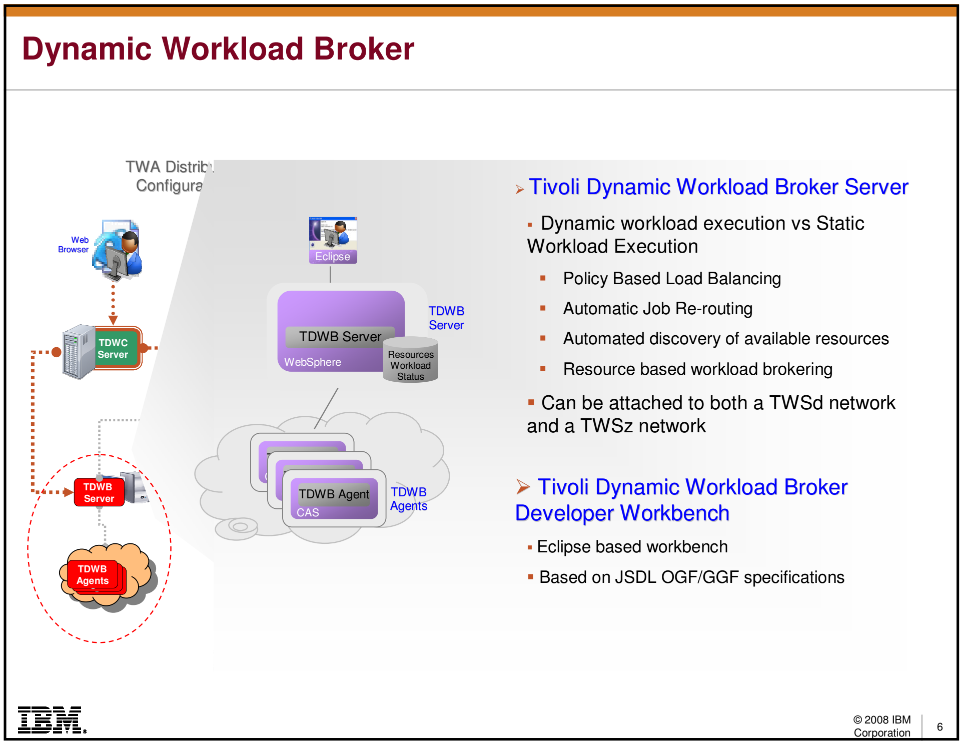


TWS distributed Scheduler

- TWSd Master
  - Central repository for workload definitions and Historical data
  - Generates, distributes and updates the scheduling plan
  - Triggers on demand workload based on events correlation rules
  - Based on RDBMS and WebSphere technology
  - Exposes J2EE and Web-services APIs for workload scheduling and management
- TWSd Backup Master
  - Same component of TWS Master with different configuration
  - Takeover TWSd Master functionality

Manager

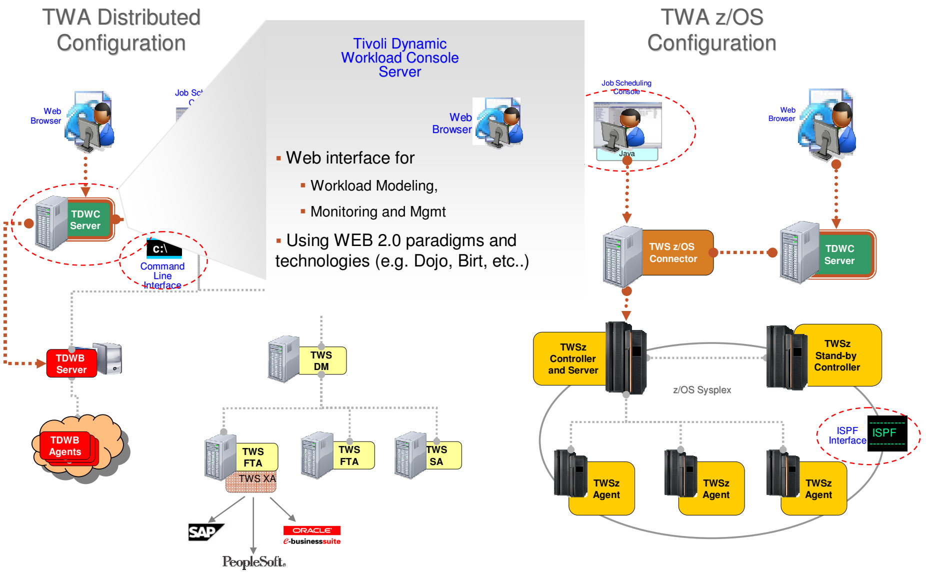
- Others



Dynamic Workload Broker

- Tivoli Dynamic Workload Broker Server
  - Dynamic workload execution vs Static Workload Execution
    - Policy Based Load Balancing
    - Automatic Job Re-routing
    - Automated discovery of available resources
    - Resource based workload brokering
  - Can be attached to both a TWSd network and a TWSz network
- Tivoli Dynamic Workload Broker Developer Workbench
  - Eclipse based workbench
  - Based on JSDL OGF/GGF specifications

User Interfaces



- Web interface for
  - Workload Modeling,
  - Monitoring and Mgmt
- Using WEB 2.0 paradigms and technologies (e.g. Dojo, Birt, etc..)

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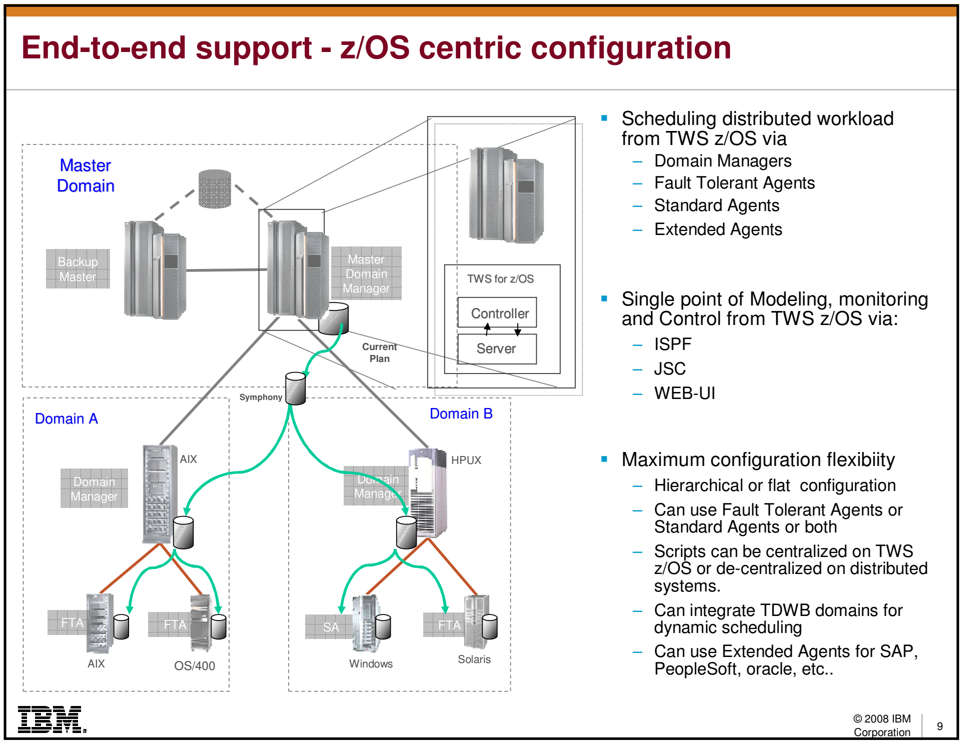
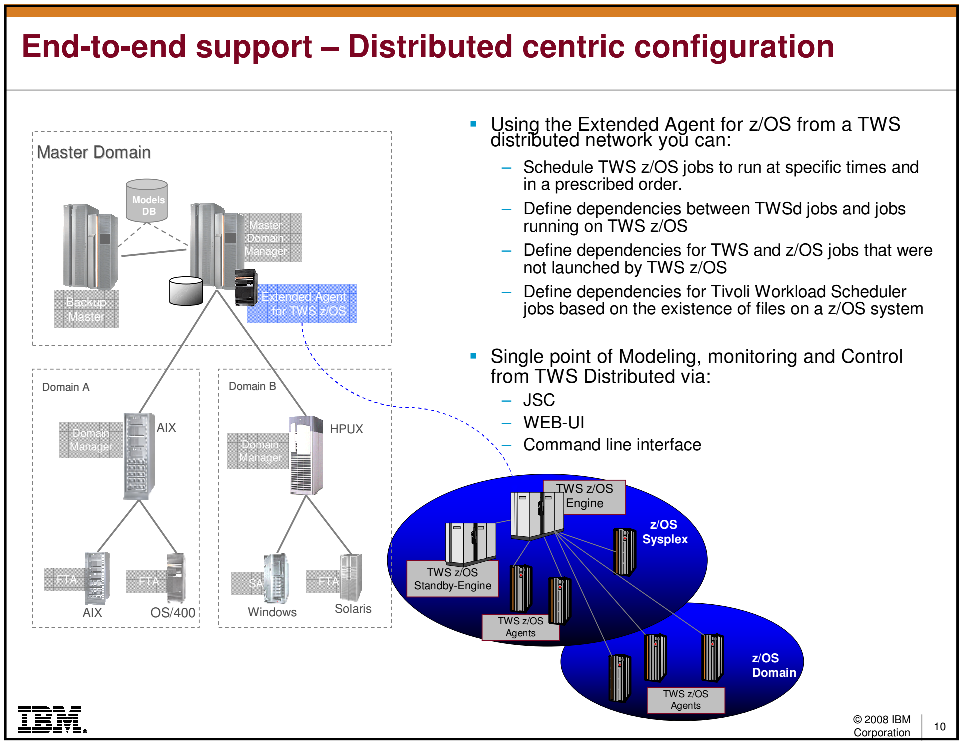


End-to-end support - z/OS centric configuration

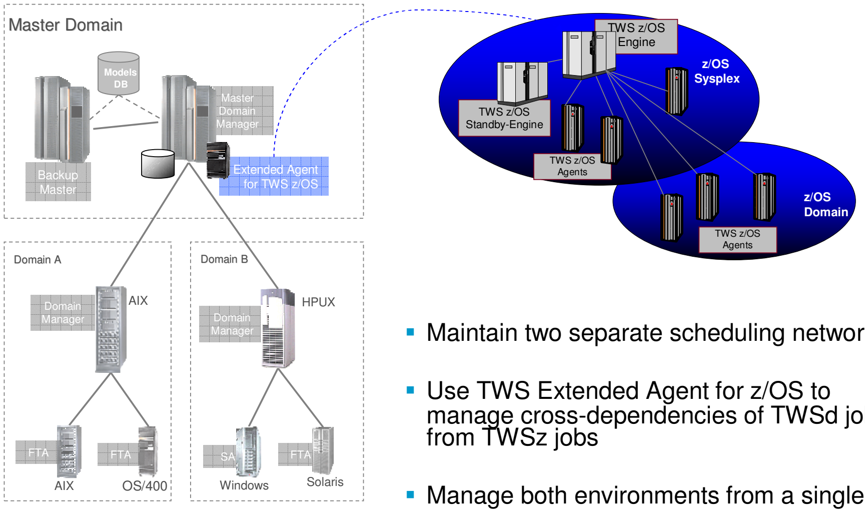
- Scheduling distributed workload from TWS z/OS via
  - Domain Managers
  - Fault Tolerant Agents
  - Standard Agents
  - Extended Agents
- Single point of Modeling, monitoring and Control from TWS z/OS via:
  - ISPF
  - JSC
  - WEB-UI
- Maximum configuration flexibiity
  - Hierarchical or flat configuration
  - Can use Fault Tolerant Agents or Standard Agents or both
  - Scripts can be centralized on TWS z/OS or de-centralized on distributed systems.
  - Can integrate TDWB domains for dynamic scheduling
  - Can use Extended Agents for SAP, PeopleSoft, oracle, etc..



End-to-end support – Distributed centric configuration

- Using the Extended Agent for z/OS from a TWS distributed network you can:
  - Schedule TWS z/OS jobs to run at specific times and in a prescribed order.
  - Define dependencies between TWSd jobs and jobs running on TWS z/OS
  - Define dependencies for TWS and z/OS jobs that were not launched by TWS z/OS
  - Define dependencies for Tivoli Workload Scheduler jobs based on the existence of files on a z/OS system
- Single point of Modeling, monitoring and Control from TWS Distributed via:
  - JSC
  - WEB-UI
  - Command line interface

End-to-end support - Peer-to-Peer configuration



- Maintain two separate scheduling networks
- Use TWS Extended Agent for z/OS to manage cross-dependencies of TWSd jobs from TWSz jobs
- Manage both environments from a single
  - WEB-UI
  - JSC

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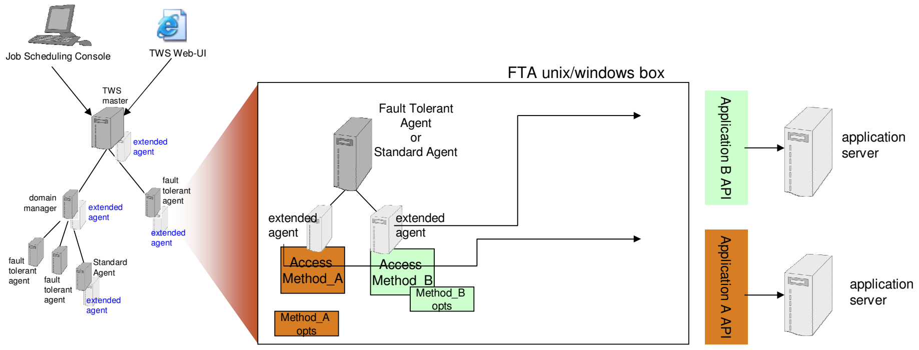
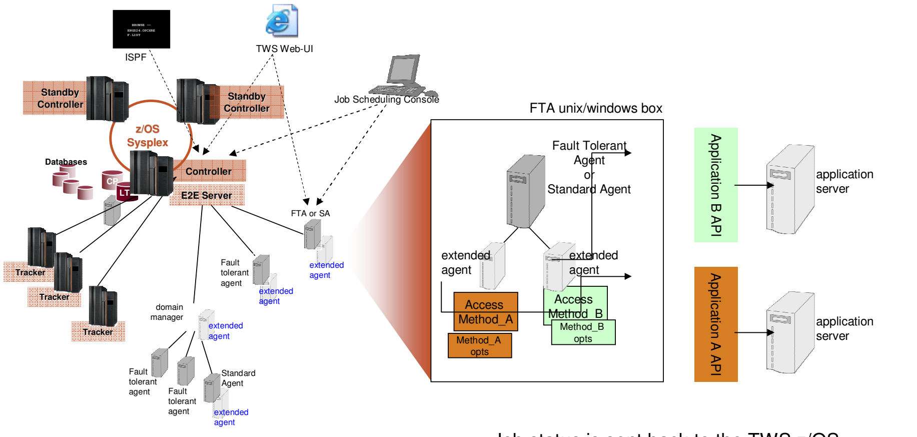
Workload Scheduler for Applications (aka Extended Agent)



- To start a job on an Xagent workstation, the Fault Tolerant Agent (or the Standard Agent) executes the access method, that attaches to the external application, finds the job (or create it on the fly) and launches it
- Job is then monitored through completion, writing progress and status to Workload Scheduler's job log
- Job status and job log can also be viewed from JSC, WEB-UI, CLI and APIs
- Job can be managed (e.g. killed, restarted, ..) from the same interfaces.

Workload Scheduler for Applications in end-to-end environment



- Extended Agents can be hosted by any Domain Manager, FTA or SA in an end-to-end network
- Call to the Extended Agent access method is triggered by the TWS FTA/SA that hosts it
- Job log is kept on the TWS FTA/SA box that hosts the X-Agent, but it can be viewed on- request

- Job status is sent back to the TWS z/OS controller, and can be monitored via
  - TWS z/OS ISPF panels
  - TWS z/OS PIF
  - JSC and WEB-UI connected to TWS z/OS
  - JSC and WEB-UI connected to TWS FTA or a TWS DM
- Job can be managed as well (e.g. kill, restart) from all the above interfaces

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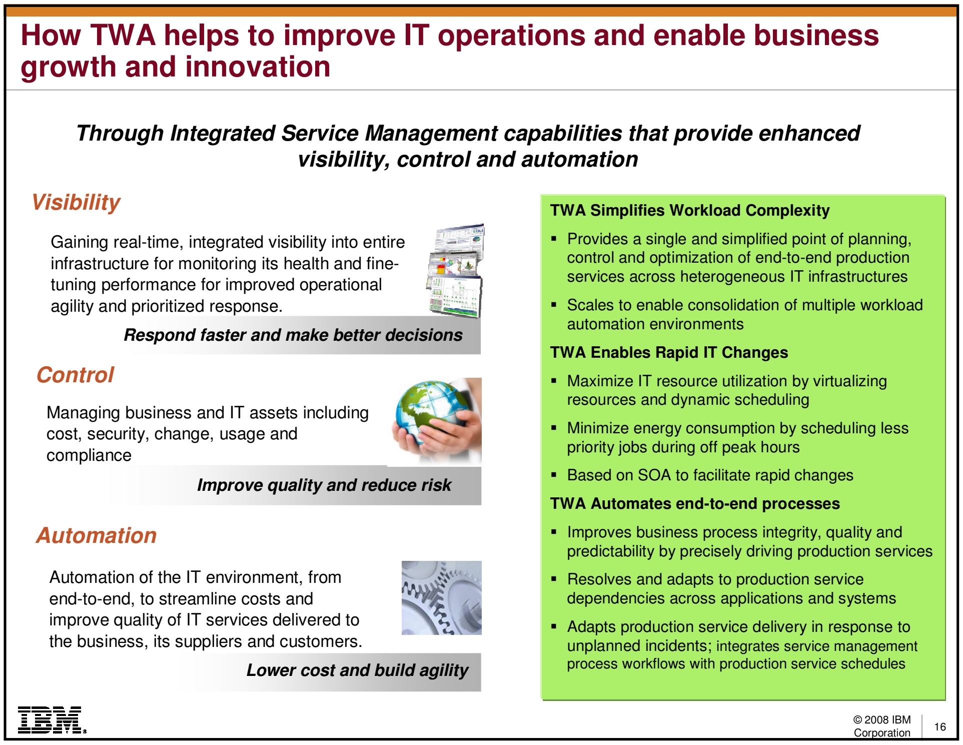


How TWA helps to improve IT operations and enable business growth and innovation

Through Integrated Service Management capabilities that provide enhanced visibility, control and automation

Visibility

Gaining real-time, integrated visibility into entire infrastructure for monitoring its health and fine-tuning performance for improved operational agility and prioritized response.

Respond faster and make better decisions

Control

Managing business and IT assets including cost, security, change, usage and compliance

Improve quality and reduce risk

Automation

Automation of the IT environment, from end-to-end, to streamline costs and improve quality of IT services delivered to the business, its suppliers and customers.

Lower cost and build agility

TWA Simplifies Workload Complexity

- Provides a single and simplified point of planning, control and optimization of end-to-end production services across heterogeneous IT infrastructures
- Scales to enable consolidation of multiple workload automation environments

TWA Enables Rapid IT Changes

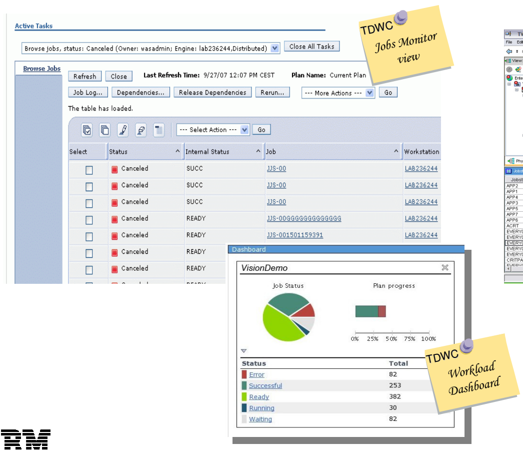
- Maximize IT resource utilization by virtualizing resources and dynamic scheduling
- Minimize energy consumption by scheduling less priority jobs during off peak hours
- Based on SOA to facilitate rapid changes

TWA Automates end-to-end processes

- Improves business process integrity, quality and predictability by precisely driving production services
- Resolves and adapts to production service dependencies across applications and systems
- Adapts production service delivery in response to unplanned incidents; integrates service management process workflows with production service schedules

Visualize – Monitor and Control the workload

- ***Single point of monitoring and operational control*** **for the entire batch workload and batch execution environments**
  - Monitor workload jobs events (e.g. job start/end) and alerts (i.e. job in error, late, long)
  - Monitor events related to scheduling infrastructure health
  - Monitoring of business Critical Jobs, critical path, critical predecessors, risk level



Active Tasks

Browse jobs, status: Canceled (Owner: wasadmin; Engine: lab236244,Distributed)

Browse Jobs

Last Refresh Time: 9/27/07 12:07 PM CEST **Plan Name:** Current Plan

The table has loaded.

Select	Status	Internal Status	Job	Workstation
□	Canceled	SUCC	JJS-00	LAB236244
□	Canceled	SUCC	JJS-00	LAB236244
□	Canceled	SUCC	JJS-00	LAB236244
□	Canceled	READY	JJS-00GGGGGGGGGGGGG	LAB236244
□	Canceled	READY	JJS-001501159391	LAB236244
□	Canceled	READY		
□	Canceled	READY		

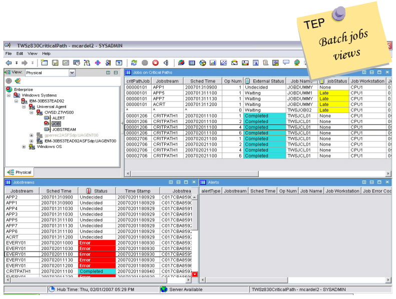
Dashboard

VisionDemo

Status	Total
Error	82
Successful	253
Ready	382
Running	30
Waiting	82

TDWC *Jobs Monitor view*

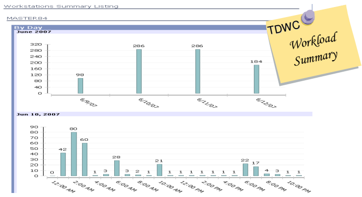
TDWC *Workload Dashboard*



TEP *Batch jobs views*

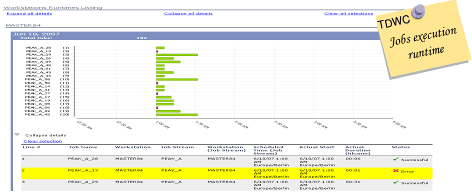
Visualize – Reporting, capacity planning, compliance…

- **Tuning the workload of workstations: job runs, comparing workload, etc…**



Workstations Summary Listing

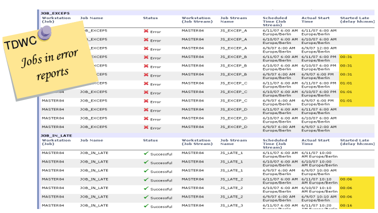
TDWC *Workload Summary*



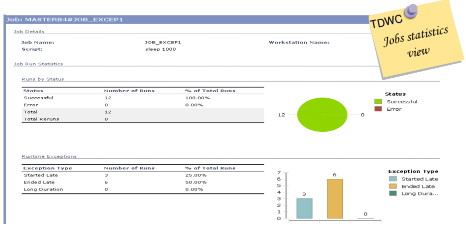
Workstations Runtimes Listing

TDWC *Jobs execution runtime*

- **Historical data analysis and statistics, detecting jobs with exceptions: success rates, late starts, long durations, missing deadlines, etc…**



TDWC *Jobs in error reports*

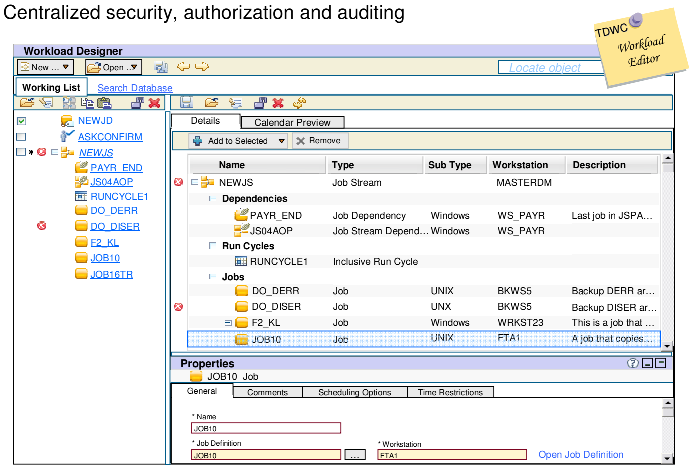


Job: MASTER84#JOB_EXCEP1

TDWC *Jobs statistics view*

Control – Modeling the Workload

- **Centralized modeling of heterogenous batch workloads across the enterprise**
  - Centralized repository for all batch objects (e.g. calendars, jobs, job-streams, resources, etc..)
  - Centralized security, authorization and auditing



- ☑ NEWJD
- □ ASKCONFIRM
- □ NEWJS
  - PAYR_END
  - JS04AOP
  - RUNCYCLE1
  - DO_DERR
  - DO_DISER
  - F2_KL
  - JOB10
  - JOB16TR

Name	Type	Sub Type	Workstation	Description
NEWJS	Job Stream		MASTERDM	
Dependencies				
PAYR_END	Job Dependency	Windows	WS_PAYR	Last job in JSPA…
JS04AOP	Job Stream Depend…	Windows	WS_PAYR	
Run Cycles				
RUNCYCLE1	Inclusive Run Cycle			
Jobs				
DO_DERR	Job	UNIX	BKWS5	Backup DERR ar…
DO_DISER	Job	UNX	BKWS5	Backup DISER ar…
F2_KL	Job	Windows	WRKST23	This is a job that …
JOB10	Job	UNIX	FTA1	A job that copies…

JOB10 Job

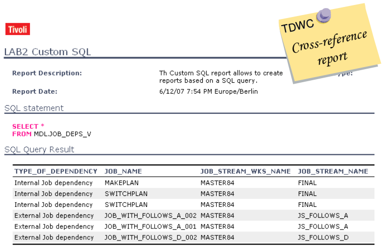
* Name: JOB10

* Job Definition: JOB10

* Workstation: FTA1

Control – Planning and forecasting the workload

- **Centralized planning for calendar-driven and event-driven batch workload**
  - Viewing and documenting current and forecast plans
  - Viewing and documenting dependencies among jobs, resources, calendars, etc…



LAB2 Custom SQL

Report Description: Th Custom SQL report allows to create reports based on a SQL query.

Report Date: 6/12/07 7:54 PM Europe/Berlin

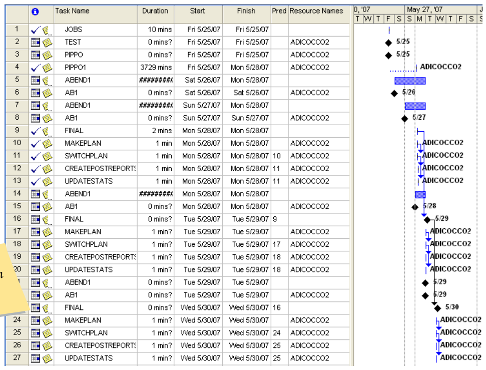
SQL statement

```
SELECT *
FROM MDL.JOB_DEPS_V
```

SQL Query Result

TYPE_OF_DEPENDENCY	JOB_NAME	JOB_STREAM_WKS_NAME	JOB_STREAM_NAME
Internal Job dependency	MAKEPLAN	MASTER84	FINAL
Internal Job dependency	SWITCHPLAN	MASTER84	FINAL
Internal Job dependency	SWITCHPLAN	MASTER84	FINAL
External Job dependency	JOB_WITH_FOLLOWS_A_002	MASTER84	JS_FOLLOWS_A
External Job dependency	JOB_WITH_FOLLOWS_A_001	MASTER84	JS_FOLLOWS_A
External Job dependency	JOB_WITH_FOLLOWS_D_002	MASTER84	JS_FOLLOWS_D

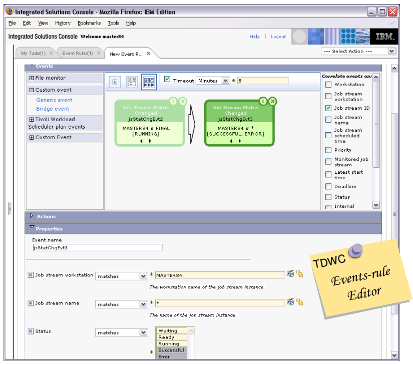
MS Project
Forecast/production plan export



	ℹ	Task Name	Duration	Start	Finish	Pred	Resource Names
1	✓	JOBS	10 mins	Fri 5/25/07	Fri 5/25/07		
2	▦	TEST	0 mins?	Fri 5/25/07	Fri 5/25/07		ADICOCCO2
3	▦	PIPPO	0 mins?	Fri 5/25/07	Fri 5/25/07		ADICOCCO2
4	✓	PIPPO1	3729 mins	Fri 5/25/07	Mon 5/28/07		ADICOCCO2
5	▦	ABEND1	#########	Sat 5/26/07	Mon 5/28/07		
6	▦	AB1	0 mins?	Sat 5/26/07	Sat 5/26/07		ADICOCCO2
7	▦	ABEND1	#########	Sun 5/27/07	Mon 5/28/07		
8	▦	AB1	0 mins?	Sun 5/27/07	Sun 5/27/07		ADICOCCO2
9	✓	FINAL	2 mins	Mon 5/28/07	Mon 5/28/07		
10	✓	MAKEPLAN	1 min	Mon 5/28/07	Mon 5/28/07		ADICOCCO2
11	✓	SWITCHPLAN	1 min	Mon 5/28/07	Mon 5/28/07	10	ADICOCCO2
12	✓	CREATEPOSTREPORTS	1 min	Mon 5/28/07	Mon 5/28/07	11	ADICOCCO2
13	✓	UPDATESTATS	1 min	Mon 5/28/07	Mon 5/28/07	11	ADICOCCO2
14	▦	ABEND1	#########	Mon 5/28/07	Mon 5/28/07		
15	▦	AB1	0 mins?	Mon 5/28/07	Mon 5/28/07		ADICOCCO2
16	▦	FINAL	0 mins?	Tue 5/29/07	Tue 5/29/07	9	
17	▦	MAKEPLAN	1 min?	Tue 5/29/07	Tue 5/29/07		ADICOCCO2
18	▦	SWITCHPLAN	1 min?	Tue 5/29/07	Tue 5/29/07	17	ADICOCCO2
19	▦	CREATEPOSTREPORTS	1 min?	Tue 5/29/07	Tue 5/29/07	18	ADICOCCO2
20	▦	UPDATESTATS	1 min?	Tue 5/29/07	Tue 5/29/07	18	ADICOCCO2
1	▦	ABEND1	0 mins?	Tue 5/29/07	Tue 5/29/07		
	▦	AB1	0 mins?	Tue 5/29/07	Tue 5/29/07		ADICOCCO2
	▦	FINAL	0 mins?	Wed 5/30/07	Wed 5/30/07	16	
24	▦	MAKEPLAN	1 min?	Wed 5/30/07	Wed 5/30/07		ADICOCCO2
25	▦	SWITCHPLAN	1 min?	Wed 5/30/07	Wed 5/30/07	24	ADICOCCO2
26	▦	CREATEPOSTREPORTS	1 min?	Wed 5/30/07	Wed 5/30/07	25	ADICOCCO2
27	▦	UPDATESTATS	1 min?	Wed 5/30/07	Wed 5/30/07	25	ADICOCCO2

Automate – Drive planned and event-driven workload

- **Automate execution of batch workload**
  - Automate workload execution based on calendar rules, events-correlation rules, jobs interdependencies, resource requirements etc...
- **Automate workload error recovery**
  - Automate jobs recovery actions
  - Automatically recalculate critical paths and risk level for critical jobs
  - Automatically promote jobs becoming late on critical path



Integrated Solutions Console - Mozilla Firefox: IBM Edition

Integrated Solutions Console Welcome master84

Events

☑ Timeout Minutes * 5

Job Stream Status Changed jsStatChgEvt2 MASTER84 # FINAL [RUNNING]

Job Stream Status Changed jsStatChgEvt3 MASTER84 # * [SUCCESSFUL, ERROR]

Correlate events on:
- □ Workstation
- □ Job stream workstation
- ☑ Job stream ID
- □ Job stream name
- □ Job stream scheduled time
- □ Priority
- □ Monitored job stream
- □ Latest start time
- □ Deadline
- □ Status
- □ Internal

Properties

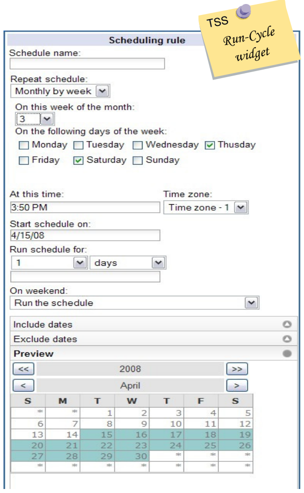
Event name: jsStatChgEvt3

☒ Job stream workstation matches * MASTER84 — *The workstation name of the job stream instance.*

☒ Job stream name matches * * — *The name of the job stream instance.*

☒ Status matches Waiting, Ready, Running, Successful, Error

TDWC *Events-rule Editor*



Scheduling rule

Schedule name:

Repeat schedule: Monthly by week

On this week of the month: 3

On the following days of the week:
□ Monday □ Tuesday □ Wednesday ☑ Thusday
□ Friday ☑ Saturday □ Sunday

At this time: 3:50 PM

Time zone: Time zone - 1

Start schedule on: 4/15/08

Run schedule for: 1 days

On weekend: Run the schedule

Include dates

Exclude dates

Preview

2008

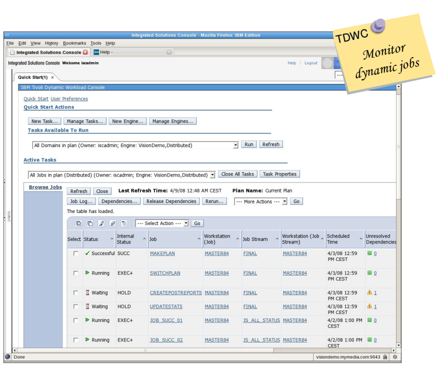
April

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

TSS *Run-Cycle widget*

Automate – Dynamically dispatch the workload

- **Dynamic workload brokering**
  - Distribute, balance and optimize workload to “best available” resource across dynamically shifting, cross-enterprise resource pool based on resource utilization
  - Route jobs to any available node that matches the resource requirement
  - Discover newly available servers as part of the pool and use them as possible job targets
  - Automatically start provisioning of new servers to meet capacity demand



Integrated Solutions Console - Mozilla Firefox: IBM Edition

Integrated Solutions Console Welcome iscadmin

IBM Tivoli Dynamic Workload Console

Tasks Available To Run: All Domains in plan (Owner: iscadmin; Engine: VisionDemo,Distributed)

Active Tasks: All Jobs in plan (Distributed) (Owner: iscadmin; Engine: VisionDemo,Distributed)

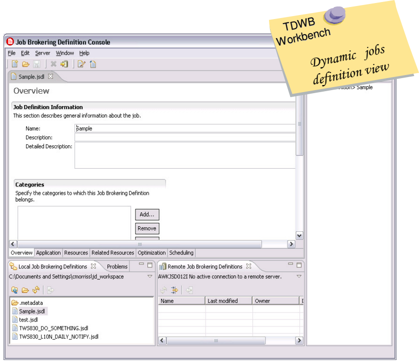
Last Refresh Time: 4/9/08 12:48 AM CEST Plan Name: Current Plan

The table has loaded.

Select	Status	Internal Status	Job	Workstation (Job)	Job Stream	Workstation (Job Stream)	Scheduled Time	Unresolved Dependencies
□	✓ Successful	SUCC	MAKEPLAN	MASTER84	FINAL	MASTER84	4/3/08 12:59 PM CEST	0
□	▶ Running	EXEC+	SWITCHPLAN	MASTER84	FINAL	MASTER84	4/3/08 12:59 PM CEST	0
□	Waiting	HOLD	CREATEPOSTREPORTS	MASTER84	FINAL	MASTER84	4/3/08 12:59 PM CEST	1
□	Waiting	HOLD	UPDATESTATS	MASTER84	FINAL	MASTER84	4/3/08 12:59 PM CEST	1
□	▶ Running	EXEC+	JOB_SUCC_01	MASTER84	JS_ALL_STATUS	MASTER84	4/2/08 1:00 PM CEST	0
□	▶ Running	EXEC+	JOB_SUCC_02	MASTER84	JS_ALL_STATUS	MASTER84	4/2/08 1:00 PM CEST	0

Done visiondemo.mymedia.com:9043

TDWC *Monitor dynamic jobs*



Job Brokering Definition Console

Sample.jsdl

Overview

Job Definition Information

This section describes general information about the job.

Name: Sample

Description:

Detailed Description:

Categories

Specify the categories to which this Job Brokering Defintion belongs.

Local Job Brokering Definitions: C:\Documents and Settings\cmorriss\jd_workspace
- .metadata
- Sample.jsdl
- test.jsdl
- TWS830_DO_SOMETHING.jsdl
- TWS830_L10N_DAILY_NOTIFY.jsdl

Remote Job Brokering Definitions: AWKJSD012I No active connection to a remote server.

TDWB Workbench *Dynamic jobs definition view*

Agenda

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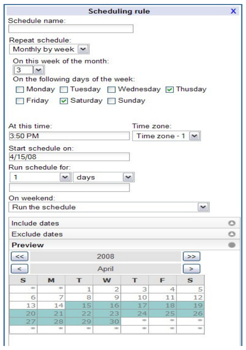
Plan driven workload automation

- Advanced planning capabilities
  - Powerful run-cycles, job streams versioning, plan spanning from 1 min. to one year, variables support, etc..
  - Plan is optimized to meet deadlines and SLAs
  - Completion logic z/OS: HIGHRC, NOERROR, JCC
  - Security
- Real forecasting and planning
- Capability to add batch workload ad-hoc
  - Through Java UI, WEB UI, CLI, ISPF and APIs
- Centralized modeling of heterogenous batch jobs workflows
  - Through Java UI, WEB UI, CLI, ISPF and APIs
- Single point of Monitoring, Control and management of batch workload Built-in Fault tolerance
  - Standby Controller
  - Fault tolerant agents through plan distribution
  - Backup manager architecture
- Automatic jobs restart/recovery and automatic datasets cleanup integrated in TWS for z/OS
- Proven scalability
  - 400.000 Jobs scheduled daily in real production environment



Scheduling rule

Schedule name:

Repeat schedule: Monthly by week

On this week of the month: 3

On the following days of the week:
□ Monday □ Tuesday □ Wednesday ☑ Thusday
□ Friday ☑ Saturday □ Sunday

At this time: 3:50 PM

Time zone: Time zone - 1

Start schedule on: 4/15/08

Run schedule for: 1 days

On weekend: Run the schedule

Include dates

Exclude dates

Preview

<< 2008 >>

< April >

S	M	T	W	T	F	S
*	*	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	*	*	*
*	*	*	*	*	*	*

Full exploitation of platform specific features (distr, z/OS)

- MS Clustering, HACMP, Sysplex for high-availability
- WLM for z/OS, Automatic Restart Manager, RMM, RODM, NetView, Catalogue Management, ...
- IPV6 support
- ....

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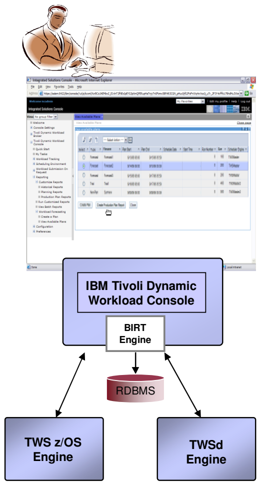
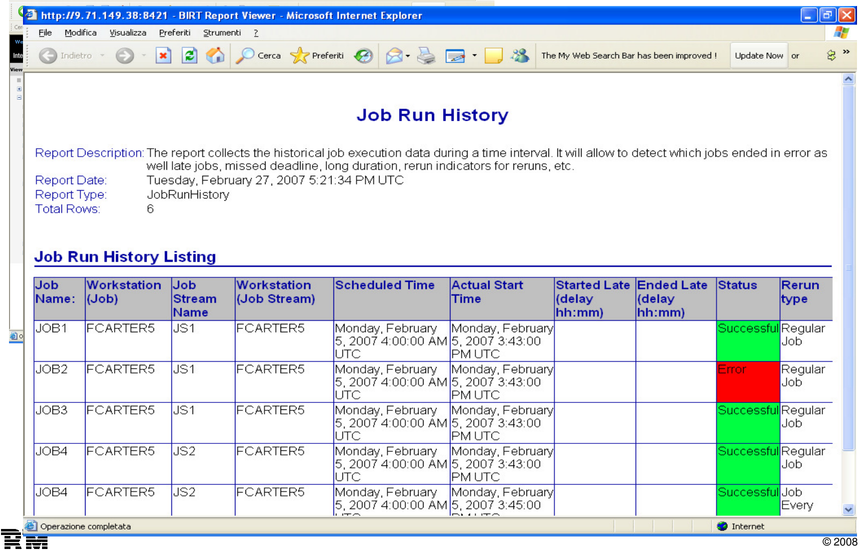
TWS forecast planning and historical reporting



- **From the TWS WEB-UI user can:**
  - Create forecast plans for future dates/periods and view them graphically or as text reports
  - Export TWSd plans into Excel or Microsoft Project documents for what-if analysis
- **Historical scheduling data (both distributed and z/OS) are consolidated into an RDBMS**
  - Allows users to create their own personalized reports (SLAs, Sarbanes-Oxley, capacity planning, etc..)
- **BIRT technology embedded in TWS WEB-UI allows to**
  - Produce highly customizable Reports
  - Develop new reports without code changes
  - Use TWS pre-canned reports
    - Job Run History
    - Job Run Statistics
    - Workstation workload summary
    - Workstation workload runtime
    - Custom SQL reports

TWS pre-canned reports - *Job Run History*



http://9.71.149.38:8421 - BIRT Report Viewer - Microsoft Internet Explorer
File Modifica Visualizza Preferiti Strumenti ?
Indietro
Cerca
Preferiti
The My Web Search Bar has been improved !
Update Now
or
Operazione completata
Internet

Job Run History

Report Description: The report collects the historical job execution data during a time interval. It will allow to detect which jobs ended in error as well late jobs, missed deadline, long duration, rerun indicators for reruns, etc.

Report Date: Tuesday, February 27, 2007 5:21:34 PM UTC

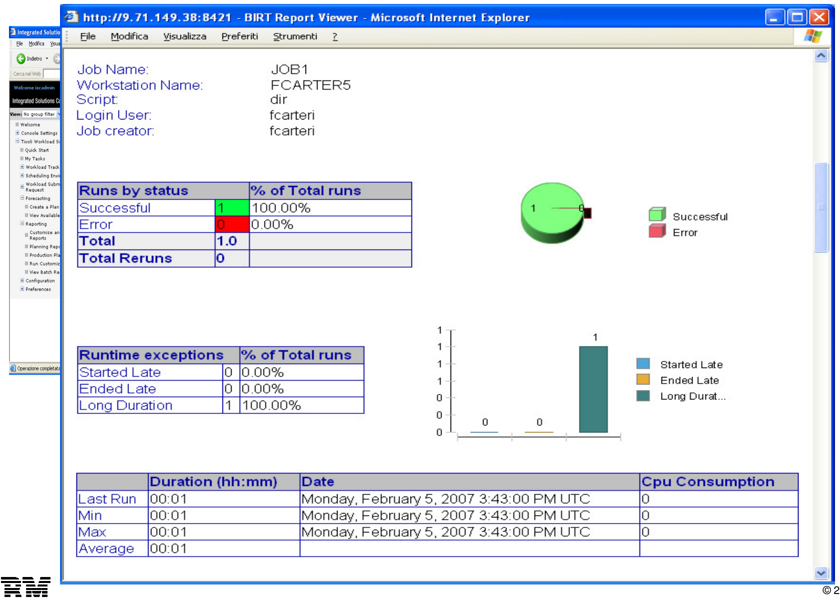
Report Type: JobRunHistory

Total Rows: 6

Job Run History Listing

Job Name:	Workstation (Job)	Job Stream Name	Workstation (Job Stream)	Scheduled Time	Actual Start Time	Started Late (delay hh:mm)	Ended Late (delay hh:mm)	Status	Rerun type
JOB1	FCARTER5	JS1	FCARTER5	Monday, February 5, 2007 4:00:00 AM UTC	Monday, February 5, 2007 3:43:00 PM UTC			Successful	Regular Job
JOB2	FCARTER5	JS1	FCARTER5	Monday, February 5, 2007 4:00:00 AM UTC	Monday, February 5, 2007 3:43:00 PM UTC			Error	Regular Job
JOB3	FCARTER5	JS1	FCARTER5	Monday, February 5, 2007 4:00:00 AM UTC	Monday, February 5, 2007 3:43:00 PM UTC			Successful	Regular Job
JOB4	FCARTER5	JS2	FCARTER5	Monday, February 5, 2007 4:00:00 AM UTC	Monday, February 5, 2007 3:43:00 PM UTC			Successful	Regular Job
JOB4	FCARTER5	JS2	FCARTER5	Monday, February 5, 2007 4:00:00 AM	Monday, February 5, 2007 3:45:00			Successful	Job Every

TWS pre-canned reports - *Job Run Statistics*



http://9.71.149.38:8421 - BIRT Report Viewer - Microsoft Internet Explorer
File Modifica Visualizza Preferiti Strumenti ?
1
0
Successful
Error
1
1
1
1
0
0
0
0
0
1
Started Late
Ended Late
Long Durat...

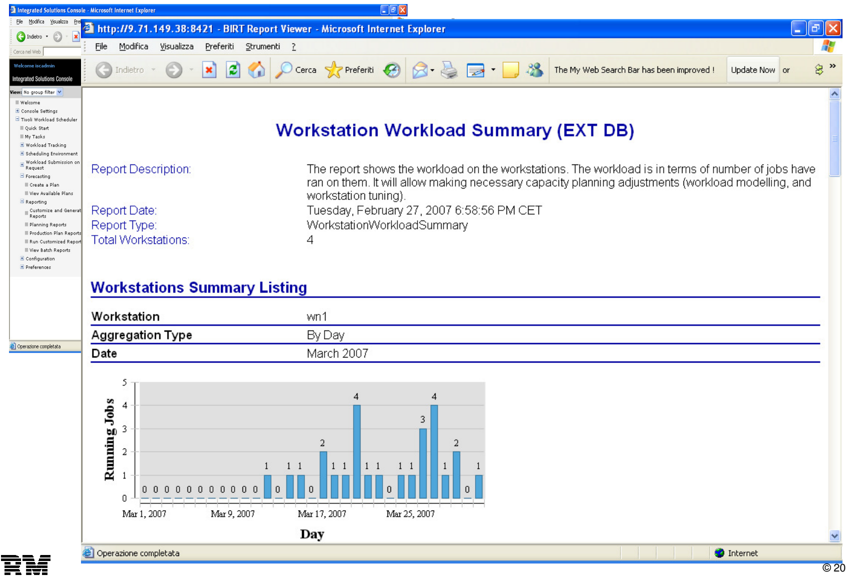
Job Name: JOB1
Workstation Name: FCARTER5
Script: dir
Login User: fcarteri
Job creator: fcarteri

Runs by status		% of Total runs
Successful	1	100.00%
Error	0	0.00%
Total	**1.0**	
Total Reruns	**0**	

Runtime exceptions		% of Total runs
Started Late	0	0.00%
Ended Late	0	0.00%
Long Duration	1	100.00%

	Duration (hh:mm)	Date	Cpu Consumption
Last Run	00:01	Monday, February 5, 2007 3:43:00 PM UTC	0
Min	00:01	Monday, February 5, 2007 3:43:00 PM UTC	0
Max	00:01	Monday, February 5, 2007 3:43:00 PM UTC	0
Average	00:01		

TWS pre-canned reports - *Workstation workload summary*



Workstation Workload Summary (EXT DB)

Report Description: The report shows the workload on the workstations. The workload is in terms of number of jobs have ran on them. It will allow making necessary capacity planning adjustments (workload modelling, and workstation tuning).

Report Date: Tuesday, February 27, 2007 6:58:56 PM CET

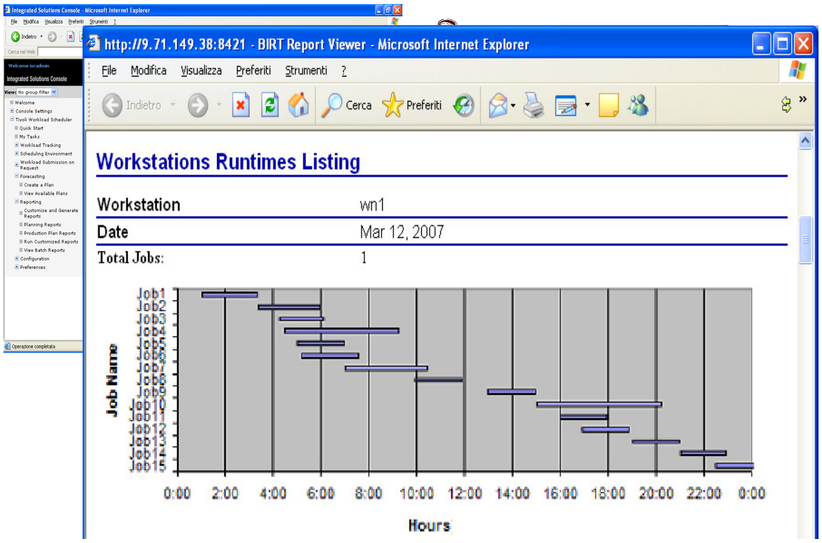
Report Type: WorkstationWorkloadSummary

Total Workstations: 4

Workstations Summary Listing

Workstation	wn1
Aggregation Type	By Day
Date	March 2007

TWS pre-canned reports - *Workstation workload runtimes*



Workstations Runtimes Listing

Workstation	wn1
Date	Mar 12, 2007
Total Jobs:	1

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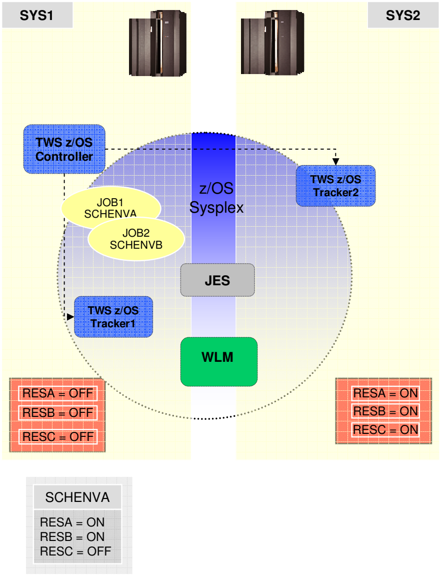
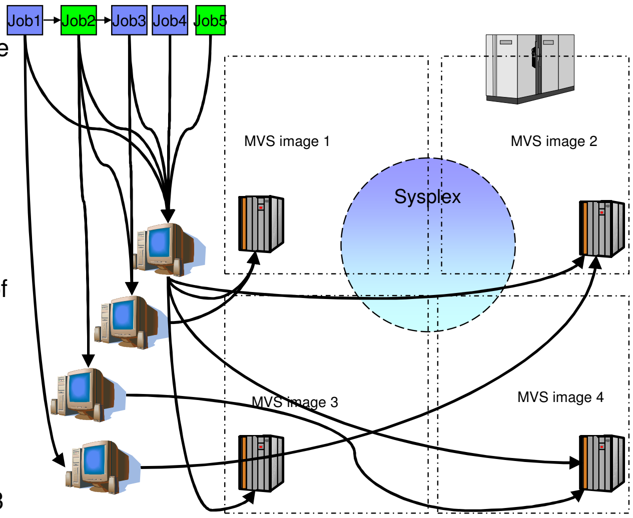
Dynamic workload brokering on z – integration with WLM



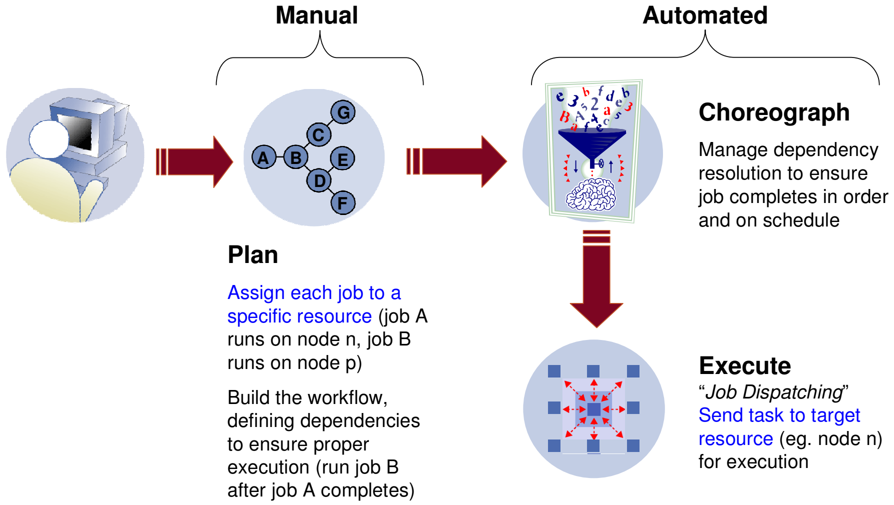
- **Workload Manager integration (WLM)**
  - Scheduling Environment (SE)
  - Service Classe objects
- **Integration with WLM SE**
  - ➢ Dynamic routing of workload to MVS systems in the Sysplex based on best available resources
  - ➢ SE becomes part of TWSz operation
  - ➢ SE availability status is checked before jobs submission
  - ➢ Automatic re-submission of jobs at SE availability status change
- **Integration with Service Class**
  - ➢ WLM Service class can be defined at TWSz operation level
  - ➢ Jobs will be promoted to the specified WLM Service Class if they are on the Critical Path

Dynamic workload brokering on z – Virtual workstations

- Traditional computer workstations might have only one “destination”
- New “virtual“ workstation, multiple destinations and availability info
- Automatic distribution of workload to different destionations
- Alternate workstation implicitly implemented
- Available from TWS 8.3 SPEs



From classic Workload automation ……



Plan

Assign each job to a specific resource (job A runs on node n, job B runs on node p)

Build the workflow, defining dependencies to ensure proper execution (run job B after job A completes)

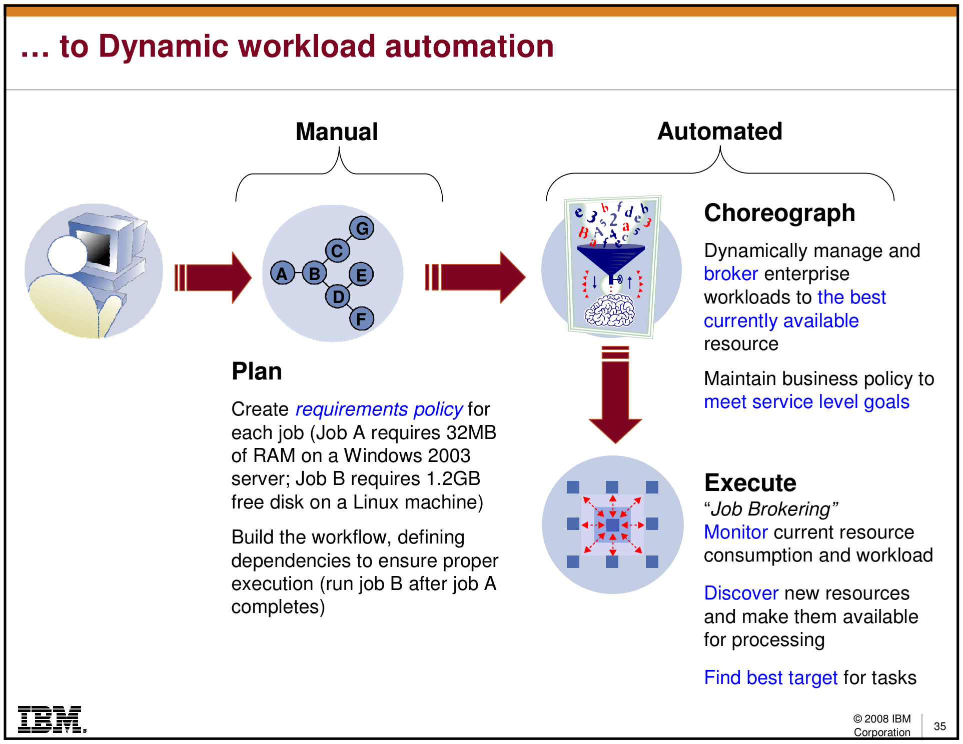
Choreograph

Manage dependency resolution to ensure job completes in order and on schedule

Execute

“*Job Dispatching*”

Send task to target resource (eg. node n) for execution



… to Dynamic workload automation

Plan

Create *requirements policy* for each job (Job A requires 32MB of RAM on a Windows 2003 server; Job B requires 1.2GB free disk on a Linux machine)

Build the workflow, defining dependencies to ensure proper execution (run job B after job A completes)

Choreograph

Dynamically manage and broker enterprise workloads to the best currently available resource

Maintain business policy to meet service level goals

Execute

"Job Brokering"

Monitor current resource consumption and workload

Discover new resources and make them available for processing

Find best target for tasks

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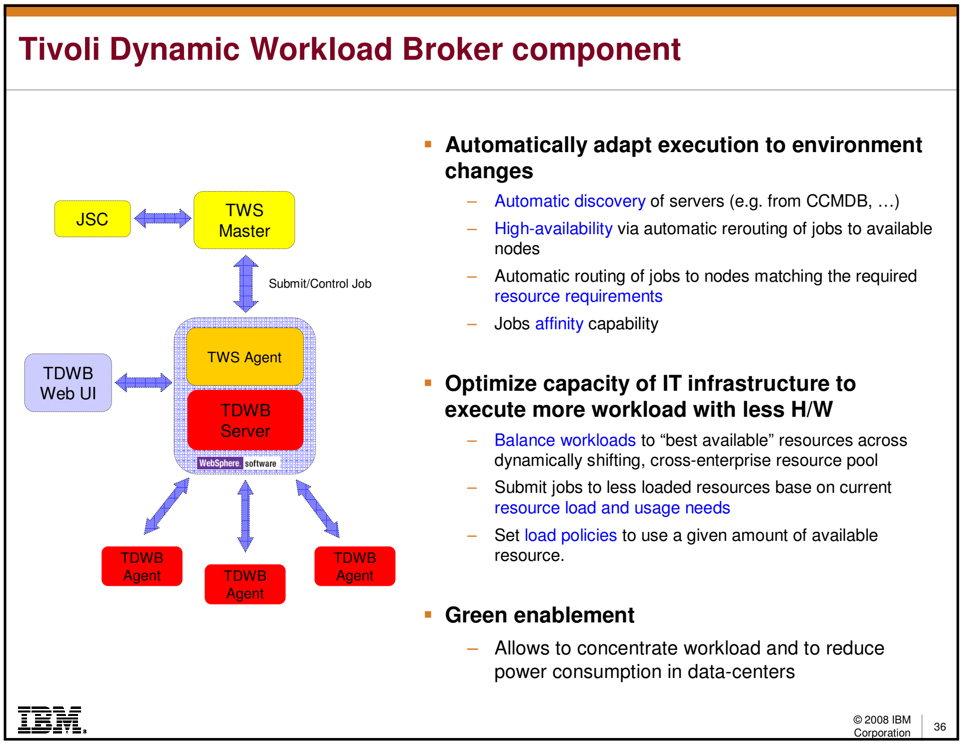

Tivoli Dynamic Workload Broker component

- **Automatically adapt execution to environment changes**
  - Automatic discovery of servers (e.g. from CCMDB, …)
  - High-availability via automatic rerouting of jobs to available nodes
  - Automatic routing of jobs to nodes matching the required resource requirements
  - Jobs affinity capability
- **Optimize capacity of IT infrastructure to execute more workload with less H/W**
  - Balance workloads to "best available" resources across dynamically shifting, cross-enterprise resource pool
  - Submit jobs to less loaded resources base on current resource load and usage needs
  - Set load policies to use a given amount of available resource.
- **Green enablement**
  - Allows to concentrate workload and to reduce power consumption in data-centers

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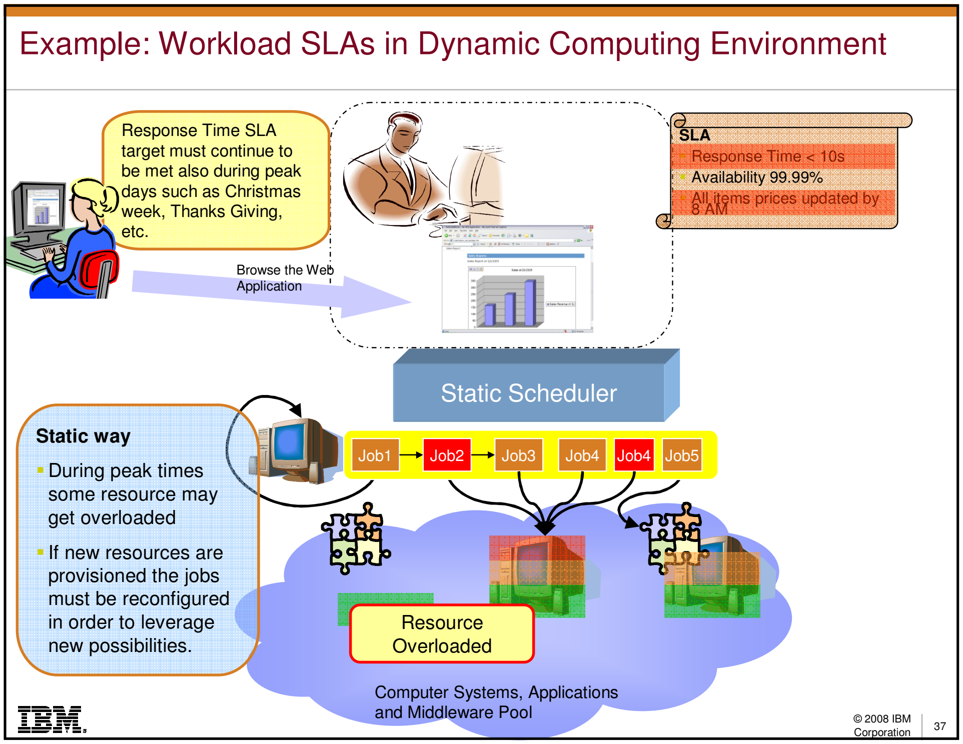

Example: Workload SLAs in Dynamic Computing Environment

Response Time SLA target must continue to be met also during peak days such as Christmas week, Thanks Giving, etc.

SLA
- Response Time < 10s
- Availability 99.99%
- All items prices updated by 8 AM

Static way
- During peak times some resource may get overloaded
- If new resources are provisioned the jobs must be reconfigured in order to leverage new possibilities.

Browse the Web Application
Static Scheduler
Job1
Job2
Job3
Job4
Job4
Job5
Resource Overloaded
Computer Systems, Applications and Middleware Pool
IBM

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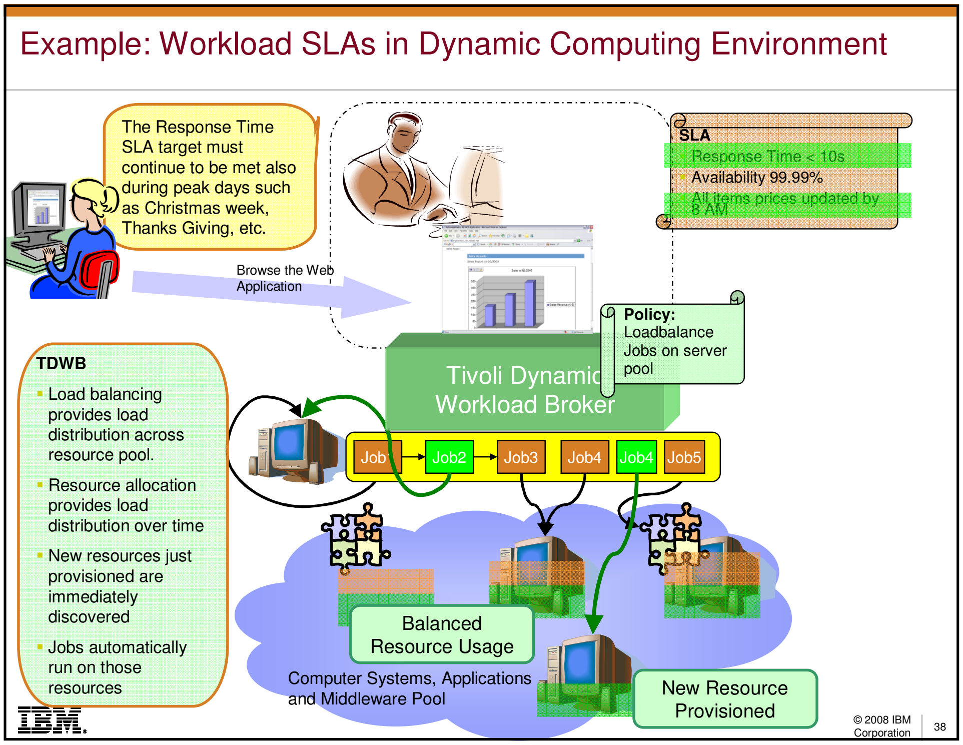

Example: Workload SLAs in Dynamic Computing Environment

The Response Time SLA target must continue to be met also during peak days such as Christmas week, Thanks Giving, etc.

SLA
- Response Time < 10s
- Availability 99.99%
- All items prices updated by 8 AM

Policy: Loadbalance Jobs on server pool

TDWB
- Load balancing provides load distribution across resource pool.
- Resource allocation provides load distribution over time
- New resources just provisioned are immediately discovered
- Jobs automatically run on those resources

Browse the Web Application
Tivoli Dynamic Workload Broker
Job
Job2
Job3
Job4
Job4
Job5
Balanced Resource Usage
Computer Systems, Applications and Middleware Pool
New Resource Provisioned
IBM

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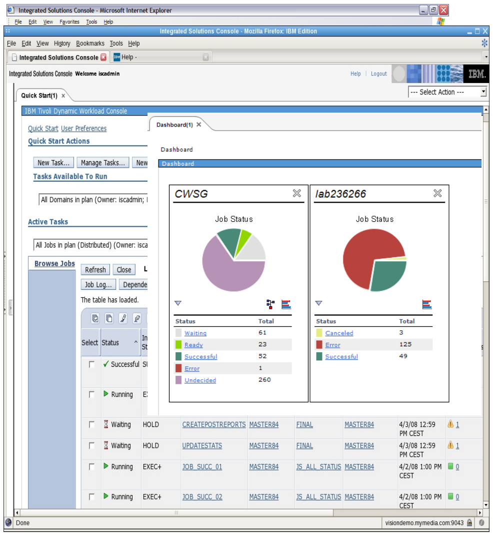
Single point of control from WEB interface



Integrated Solutions Console - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Integrated Solutions Console - Mozilla Firefox: IBM Edition
File Edit View History Bookmarks Tools Help
Integrated Solutions Console
Help -
Integrated Solutions Console Welcome iscadmin
Help | Logout
--- Select Action ---
Quick Start(1)
IBM Tivoli Dynamic Workload Console
Quick Start User Preferences
Quick Start Actions
New Task... Manage Tasks... New
Tasks Available To Run
All Domains in plan (Owner: iscadmin; I
Active Tasks
All Jobs in plan (Distributed) (Owner: isca
Browse Jobs
Refresh Close
Job Log... Depende
Dashboard(1)
Dashboard
Dashboard
CWSG
Job Status
lab236266
Job Status
Done
visiondemo.mymedia.com:9043

The table has loaded.

CWSG

Status	Total
Waiting	61
Ready	23
Successful	52
Error	1
Undecided	260

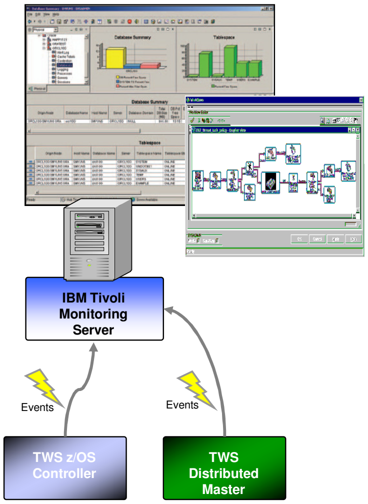
lab236266

Status	Total
Canceled	3
Error	125
Successful	49

Select	Status	In St						
□	✓ Successful	SU						
□	▶ Running	EX						
□	Waiting	HOLD	CREATEPOSTREPORTS	MASTER84	FINAL	MASTER84	4/3/08 12:59 PM CEST	1
□	Waiting	HOLD	UPDATESTATS	MASTER84	FINAL	MASTER84	4/3/08 12:59 PM CEST	1
□	▶ Running	EXEC+	JOB_SUCC_01	MASTER84	JS_ALL_STATUS	MASTER84	4/2/08 1:00 PM CEST	0
□	▶ Running	EXEC+	JOB_SUCC_02	MASTER84	JS_ALL_STATUS	MASTER84	4/2/08 1:00 PM CEST	0

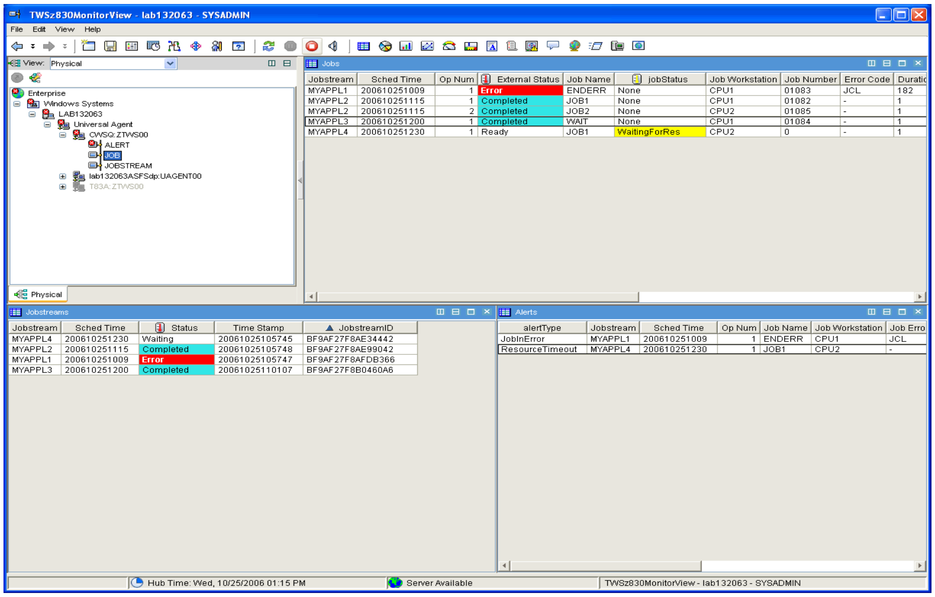
- **Tivoli Dynamic Workload Console is the new Web-based GUI for TWA family**
  - A component of TWS z/OS and TWSd
  - Included and supported at no extra charge
- **Single Web-based control point for the entire enterprise workload automation network**
  - Monitor the workload through customizable views or dashboards
  - Manage workload
  - Create and browse forecast plans
  - Create reports and statistics on historical activity
  - Built-in notifications capabilities, through
    - Email
    - Event to T/EC and TEP
    - Message in a log file
    - User plugins

Single point of control from Tivoli Enterprise Portal (ITM)



- **Monitor critical jobs and resources status from TEP together with other monitoring events from disparate resources**
- **Provide user specified messages based on events and alerts**
  - Job related events for pre-defined jobs
    - Job start
    - Job end
    - New job added to the Current Plan
  - Alerts for all jobs, based on user policies
    - Ended in error jobs
    - Long duration
    - Late jobs
    - Special Resource time out
  - Subtask and agents related events
    - Subtask Ended in error
    - Exceeding queues thresholds
    - Agent linked/unlinked
    - Agent started/stopped

Single point of control from Tivoli Enterprise Portal (ITM)



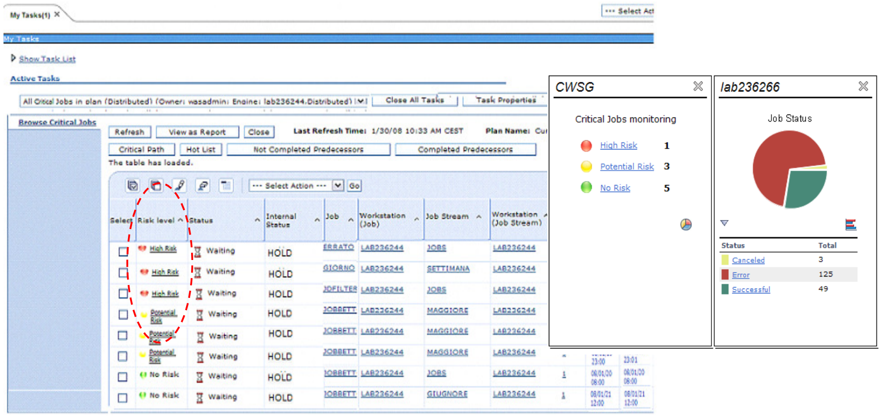
Jobstream	Sched Time	Op Num	External Status	Job Name	jobStatus	Job Workstation	Job Number	Error Code	Duratio
MYAPPL1	200610251009	1	Error	ENDERR	None	CPU1	01083	JCL	182
MYAPPL2	200610251115	1	Completed	JOB1	None	CPU1	01082	-	1
MYAPPL2	200610251115	2	Completed	JOB2	None	CPU2	01085	-	1
MYAPPL3	200610251200	1	Completed	WAIT	None	CPU1	01084	-	1
MYAPPL4	200610251230	1	Ready	JOB1	WaitingForRes	CPU2	0	-	1

Jobstream	Sched Time	Status	Time Stamp	JobstreamID
MYAPPL4	200610251230	Waiting	20061025105745	BF9AF27F8AE34442
MYAPPL2	200610251115	Completed	20061025105748	BF9AF27F8AE99042
MYAPPL1	200610251009	Error	20061025105747	BF9AF27F8AFDB366
MYAPPL3	200610251200	Completed	20061025110107	BF9AF27F8B0460A6

alertType	Jobstream	Sched Time	Op Num	Job Name	Job Workstation	Job Erro
JobInError	MYAPPL1	200610251009	1	ENDERR	CPU1	JCL
ResourceTimeout	MYAPPL4	200610251230	1	JOB1	CPU2	-

Hub Time: Wed, 10/25/2006 01:15 PM
Server Available
TWSz830MonitorView - lab132063 - SYSADMIN

Proactive Monitoring and Workload Service Assurance



All Critical Jobs in plan (Distributed) (Owner: wasadmin; Engine: lab236244.Distributed)

Last Refresh Time: 1/30/08 10:33 AM CEST Plan Name: Cur

The table has loaded.

Select	Risk level	Status	Internal Status	Job	Workstation (Job)	Job Stream	Workstation (Job Stream)			
□	High Risk	Waiting	HOLD	ERRATO	LAB236244	JOBS	LAB236244			
□	High Risk	Waiting	HOLD	GIORNO	LAB236244	SETTIMANA	LAB236244			
□	High Risk	Waiting	HOLD	JOFILTER	LAB236244	JOBS	LAB236244			
□	Potential Risk	Waiting	HOLD	JOBBETT	LAB236244	MAGGIORE	LAB236244			
□	Potential Risk	Waiting	HOLD	JOBBETT	LAB236244	MAGGIORE	LAB236244			
□	Potential Risk	Waiting	HOLD	JOBBETT	LAB236244	MAGGIORE	LAB236244	–	23:00	23:01
□	No Risk	Waiting	HOLD	JOBBETT	LAB236244	JOBS	LAB236244	1	08/01/20 08:00	08/01/20 08:00
□	No Risk	Waiting	HOLD	JOBBETT	LAB236244	GIUGNORE	LAB236244	1	08/01/21 12:00	08/01/21 12:00

CWSG

Critical Jobs monitoring

🔴 High Risk	1
🟡 Potential Risk	3
🟢 No Risk	5

lab236266

Job Status

Status	Total
🟨 Canceled	3
🟥 Error	125
🟩 Successful	49

- Helps business critical workload to match SLA expressed as target deadlines
- Automatic promotion algorithms to track delay critical workload back on track
- Proactive enablement of user remedial actions

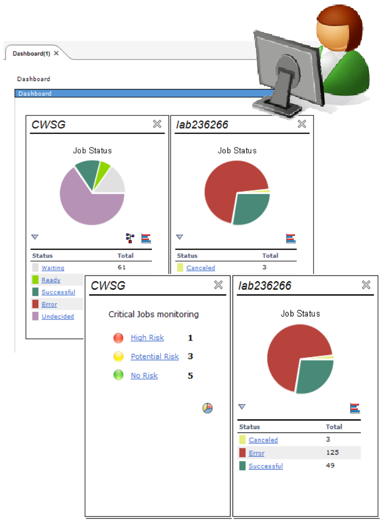
Workload Service Assurance: *The solution*

Administration	Identifies critical workload
Automation	Calculates critical path to critical workload and keep it dynamically updated
Automation	Takes autonomous remedial actions for lagging jobs in the critical path (leveraging WLM integration)
Operation	Gives a view of how well workload is progressing to reach critical end points (risk level of end points), to trigger proactive human reaction

Workload Service Assurance: *The ultimate scenario*

1. The WEB UI critical jobs dashboard gives at a first glance the view of how well the critical workload is proceeding
2. Pies of color-coded high risk, potential risk and no risk jobs are provided
3. Likely Dean explores high risk job first and checks whether automatic remedial actions are enough to take the workload back on course or human intervention is needed
4. Then goes to potential risk jobs (critical jobs that are not at risk, nevertheless they have delays or errors in the network of predecessors)
5. Dean fixes the potential problem with a potential risk job (i.e. a predecessor was in error) and he realizes that all critical jobs are now on track!

Dean: the operator



CWSG

Status	Total
Waiting	61
Ready	
Successful	
Error	
Undecided	

lab236266

Status	Total
Canceled	3

CWSG — Critical Jobs monitoring

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lab236266

Status	Total
Canceled	3
Error	125
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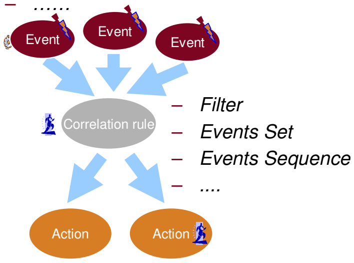
Event-driven workload automation

- ❑ **Extend current TWSd capabilities by allowing user to define event-driven rules for batch jobs scheduling**
  - ➢ Trigger the execution of TWS batch jobs and job streams based on the reception or combination of real-time “events”.
- ❑ **Provide real-time user notification feature**
  - ➢ Notify users when anomalous conditions happens in the TWS scheduling infrastructure or in the TWS batch scheduling activity
- ❑ **Extend TWS integrability with third party products**
  - ➢ Allow to call an external product from TWS when a particular event condition happens in TWS
- ❑ **Improve TWS self-monitoring and self-healing capabilities**
  - ➢ Allow to automate recovery actions for TWS infrastructure or scheduling problems

- ❑ **TWS z/OS already provided a similar functionality through the so called ETT function. Work is in progress to align the two functions**

Event-driven workload automation

- – *“filex is created”*
- – *“message xyz issued in a log-file“*
- – *Jobx abended with RC=12” ;*
- – *“TWS agent unlinked”;*
- – *“An email is received”; “*
- – *Event xyz issued on SAP*
- – *……*

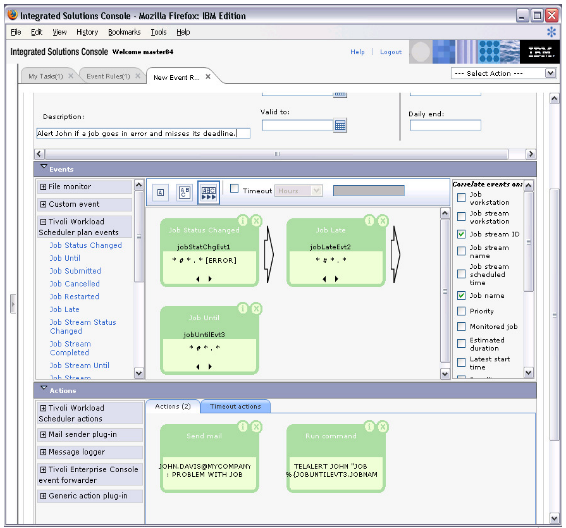


- – *Filter*
- – *Events Set*
- – *Events Sequence*
- – *….*

- – *Submit a TWS job/jobStream*
- – *Start any TWS command*
- – *“Send an e-mail”,*
- – *“Send An event to T/EC”,*
- – *Write a message in msg log*
- – *….*

Pluggable and extensible architecture

A TWS Eclipse workbench is provided to write and deploy new plugins for displaying new event types in the UI, and to create new actions



Integrated Solutions Console - Mozilla Firefox: IBM Edition
File Edit View History Bookmarks Tools Help
Integrated Solutions Console Welcome master84
Help | Logout
IBM.
My Tasks(1)
Event Rules(1)
New Event R...
--- Select Action ---
Events
Actions

Description: Alert John if a job goes in error and misses its deadline.

Valid to:

Daily end:

Events

⊞ File monitor
⊞ Custom event
⊟ Tivoli Workload Scheduler plan events
Job Status Changed
Job Until
Job Submitted
Job Cancelled
Job Restarted
Job Late
Job Stream Status Changed
Job Stream Completed
Job Stream Until
Job Stream

□ Timeout Hours

Job Status Changed: jobStatChgEvt1 — * # * . * [ERROR]

Job Late: jobLateEvt2 — * # * . *

Job Until: jobUntilEvt3 — * # * . *

Correlate events on:
□ Job workstation
□ Job stream workstation
☑ Job stream ID
□ Job stream name
□ Job stream scheduled time
☑ Job name
□ Priority
□ Monitored job
□ Estimated duration
□ Latest start time

Actions

⊞ Tivoli Workload Scheduler actions
⊞ Mail sender plug-in
⊞ Message logger
⊞ Tivoli Enterprise Console event forwarder
⊞ Generic action plug-in

Actions (2) | Timeout actions

Send mail: JOHN.DAVIS@MYCOMPANY : PROBLEM WITH JOB

Run command: TELALERT JOHN "JOB %{JOBUNTILEVT3.JOBNAM

Agenda

- **Tivoli Workload Automation family**
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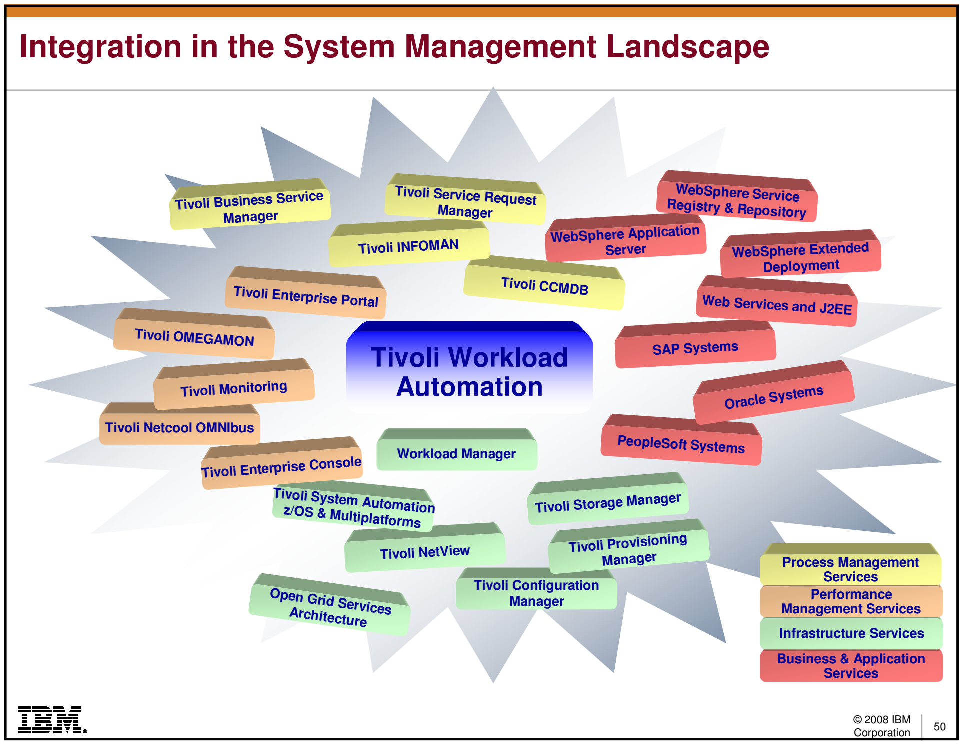
- **Key Workload Automation features**
  - Plan driven workload automation
  - Workload planning, forecasting, reporting and compliance
  - Dynamic workload optimization and virtualization
  - Centralized and proactive workload monitoring
  - Event driven workload automation
  - Integrations in service management landscape
- **Latest and next updates**
- **TWA evolution strategy**



Integration in the System Management Landscape

Tivoli Workload Automation

Tivoli Business Service Manager

Tivoli Service Request Manager

Tivoli INFOMAN

Tivoli Enterprise Portal

Tivoli CCMDB

Tivoli OMEGAMON

Tivoli Monitoring

Tivoli Netcool OMNIbus

Tivoli Enterprise Console

Workload Manager

Tivoli System Automation z/OS & Multiplatforms

Tivoli NetView

Open Grid Services Architecture

Tivoli Configuration Manager

Tivoli Storage Manager

Tivoli Provisioning Manager

WebSphere Service Registry & Repository

WebSphere Application Server

WebSphere Extended Deployment

Web Services and J2EE

SAP Systems

Oracle Systems

PeopleSoft Systems

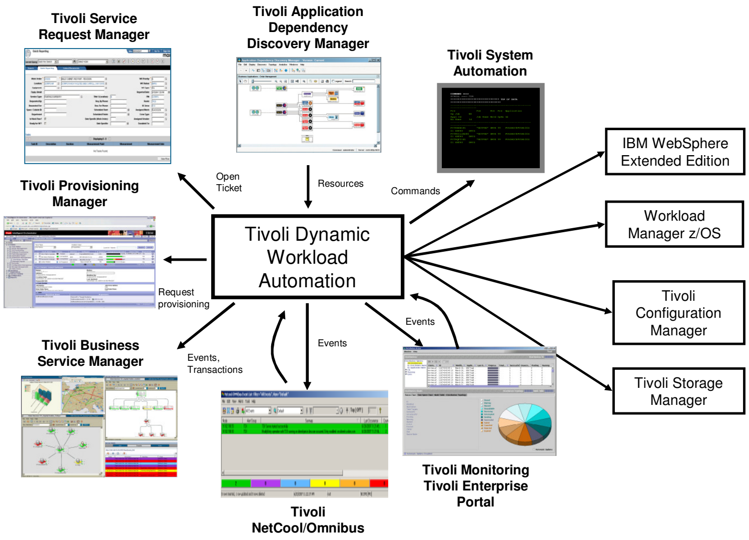
Process Management Services

Performance Management Services

Infrastructure Services

Business & Application Services

Major Integrations



Tivoli Service Request Manager

Tivoli Application Dependency Discovery Manager

Tivoli System Automation

IBM WebSphere Extended Edition

Workload Manager z/OS

Tivoli Configuration Manager

Tivoli Storage Manager

Tivoli Provisioning Manager

Tivoli Dynamic Workload Automation

Open Ticket

Resources

Commands

Request provisioning

Events

Events, Transactions

Events

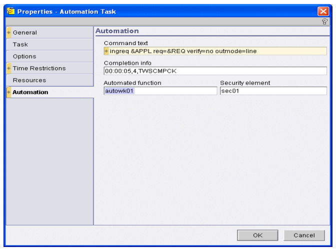
Tivoli Business Service Manager

Tivoli NetCool/Omnibus

Tivoli Monitoring Tivoli Enterprise Portal

Major integrations – Tivoli System Automation

TWS for z/OS 8.3



Properties - Automation Task

General
Task
Options
Time Restrictions
Resources
Automation

Automation

Command text: ingreq &APPL req=&REQ verify=no outmode=line

Completion info: 00:00:05,4,TWSCMPCK

Automated function: autowk01

Security element: sec01

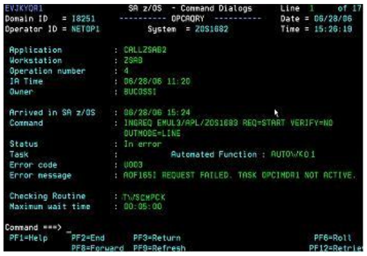
OK Cancel

Define System Automation commands in TWS for z/OS

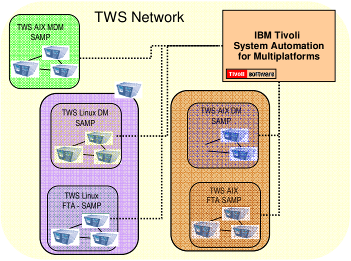
Execute System Automation commands from TWS z/OS

Get command execution results from SA for z/OS

SA for z/OS 3.1

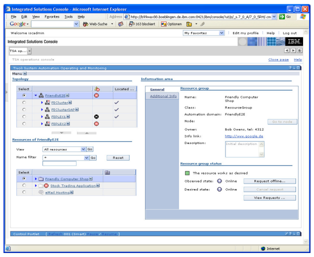


```
EVJKYQR1                SA z/OS  - Command Dialogs        Line  1      of 17
Domain ID   = I8251     ---------- OPCAQRY ----------     Date = 06/28/06
Operator ID = NETOP1          System   = ZOS1682          Time = 15:26:19

 Application              : CALLZSAB2
 Workstation              : ZSAB
 Operation number         : 4
 IA Time                  : 06/28/06 11:20
 Owner                    : BUCOSSI

 Arrived in SA z/OS       : 06/28/06 15:24
 Command                  : INGREQ EMUL3/APL/ZOS1683 REQ=START VERIFY=NO
                            OUTMODE=LINE
 Status                   : In error
 Task                     :             Automated Function : AUTOWK01
 Error code               : U003
 Error message            : AOF165I REQUEST FAILED. TASK OPCIMDR1 NOT ACTIVE.

 Checking Routine         : TWSCMPCK
 Maximum wait time        : 00:05:00

Command ===> _
 PF1=Help     PF2=End      PF3=Return                            PF6=Roll
              PF8=Forward  PF9=Refresh                          PF12=Retrie
```



Failover Scenario

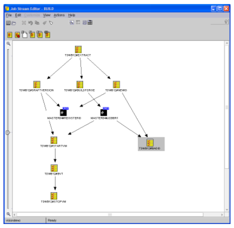
When System Automation detects a failure (network, disk or application) on a TWS Master it automatically fail over to the TWS Standby Master in a matter of seconds.



Integrated Solutions Console - Microsoft Internet Explorer
Integrated Solutions Console
IBM

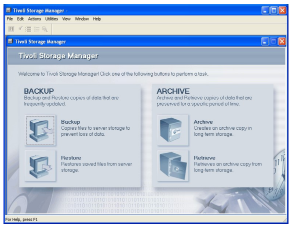
Major integrations – Tivoli Storage Manager

TWS



Control TSM backups and Administrative tasks within TWS batch flows scheduled with complex calendar rules or based on events

TSM 5.4



Welcome to Tivoli Storage Manager! Click one of the following buttons to perform a task.

BACKUP
Backup and Restore copies of data that are frequently updated.

Backup
Copies files to server storage to prevent loss of data.

Restore
Restores saved files from server storage.

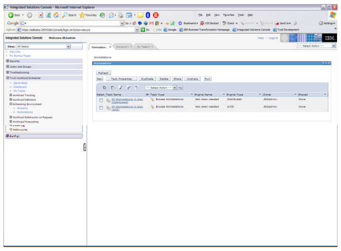
ARCHIVE
Archive and Retrieve copies of data that are preserved for a specific period of time.

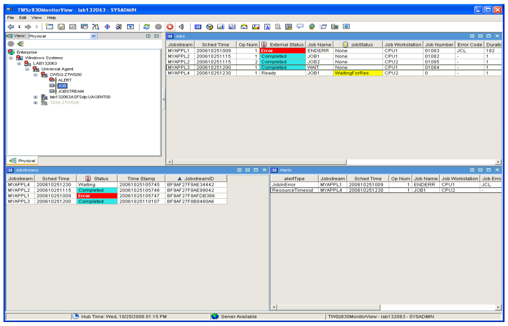
Archive
Creates an archive copy in long-term storage.

Retrieve
Retrieves an archive copy from long-term storage.

For Help, press F1

Major integrations – Tivoli Monitoring solutions





Jobstream	Sched Time	Op Num	External Status	Job Name	jobStatus	Job Workstation	Job Number	Error Code	Duratio
MYAPPL1	200610251009	1	Error	ENDERR	None	CPU1	01083	JCL	182
MYAPPL2	200610251115	1	Completed	JOB1	None	CPU1	01082	-	1
MYAPPL2	200610251115	2	Completed	JOB2	None	CPU2	01085	-	1
MYAPPL3	200610251200	1	Completed	WAIT	None	CPU1	01084	-	1
MYAPPL4	200610251230	1	Ready	JOB1	WaitingForRes	CPU2	0	-	1

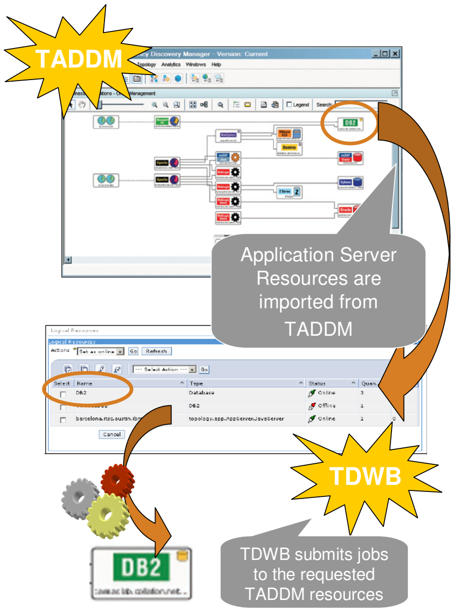
Jobstream	Sched Time	Status	Time Stamp	JobstreamID
MYAPPL4	200610251230	Waiting	20061025105745	BF9AF27F8AE34442
MYAPPL2	200610251115	Completed	20061025105748	BF9AF27F8AE99042
MYAPPL1	200610251009	Error	20061025105747	BF9AF27F8AFDB366
MYAPPL3	200610251200	Completed	20061025110107	BF9AF27F8B0460A6

alertType	Jobstream	Sched Time	Op Num	Job Name	Job Workstation	Job Erro
JobInError	MYAPPL1	200610251009	1	ENDERR	CPU1	JCL
ResourceTimeout	MYAPPL4	200610251230	1	JOB1	CPU2	-

- Monitor TWS jobs and infrastructure events from “Tivoli Enterprise Portal” and “Tivoli Business Service Manager” console
- Use the TWS event-driven feature to
  - Send events from TWS to ITM based on job events correlation rules
  - Automate TWS actions (e.g. jobs submission, jobs deletion, etc..) based on events coming from ITM

Major integrations – TADDM, CCMDB, TSRM

- TDWB integration with TADDM
  - Discovery assets (i.e. servers and applications) from CCMDB
  - Automatically adapt execution to IT configuration changes
- TWSd integration with TADDM
  - Schedule TADDM discoveries and synchronizations
  - Export TWS workstations topology to CCMDB
  - Used for change management scenarios to evaluate impact of changes to batch environment
- TWSd Integration with TSRM Service desk
  - Automatically open incident tickets to "TSRM Service Desk"


TADDM
Discovery Manager - Version: Current
Topology Analytics Windows Help
DB2
Logical Resources
Actions Set as online Go Refresh
--- Select Action --- Go
Cancel
TDWB
DB2

Select	Name	Type	Status	Quan...
□	DB2	Database	Online	3
□	[illegible]	DB2	Offline	1
□	barcelona.itsc.austin.ibm	topology.app.AppServer.JavaServer	Online	1

Application Server Resources are imported from TADDM

TDWB submits jobs to the requested TADDM resources

Agenda

- Tivoli Workload Automation family
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- Key Workload Automation features
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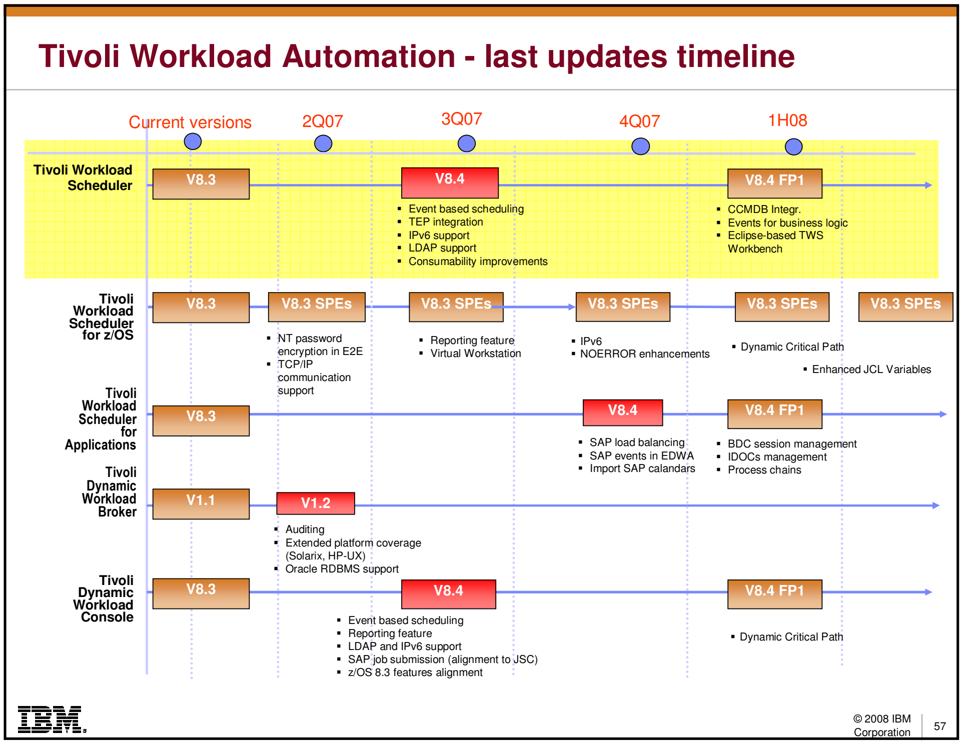
  - Dynamic workload optimization and virtualization
  - Centralized and proactive workload monitoring
  - Event driven workload automation
  - Integrations in service management landscape
- ➡ Latest and next updates
- TWA evolution strategy



Tivoli Workload Automation - last updates timeline

Current versions | 2Q07 | 3Q07 | 4Q07 | 1H08

Tivoli Workload Scheduler: V8.3 → V8.4 → V8.4 FP1

V8.4:
- Event based scheduling
- TEP integration
- IPv6 support
- LDAP support
- Consumability improvements

V8.4 FP1:
- CCMDB Integr.
- Events for business logic
- Eclipse-based TWS Workbench

Tivoli Workload Scheduler for z/OS: V8.3 → V8.3 SPEs → V8.3 SPEs → V8.3 SPEs → V8.3 SPEs → V8.3 SPEs

V8.3 SPEs:
- NT password encryption in E2E
- TCP/IP communication support

V8.3 SPEs:
- Reporting feature
- Virtual Workstation

V8.3 SPEs:
- IPv6
- NOERROR enhancements

V8.3 SPEs:
- Dynamic Critical Path

V8.3 SPEs:
- Enhanced JCL Variables

Tivoli Workload Scheduler for Applications: V8.3 → V8.4 → V8.4 FP1

V8.4:
- SAP load balancing
- SAP events in EDWA
- Import SAP calandars

V8.4 FP1:
- BDC session management
- IDOCs management
- Process chains

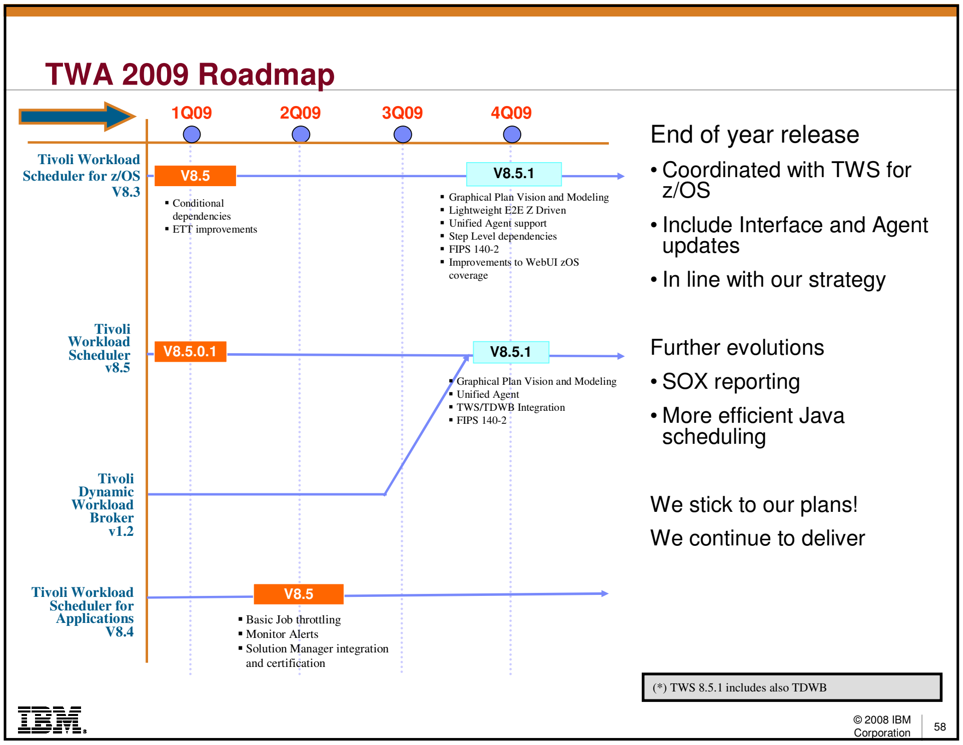
Tivoli Dynamic Workload Broker: V1.1 → V1.2

V1.2:
- Auditing
- Extended platform coverage (Solarix, HP-UX)
- Oracle RDBMS support

Tivoli Dynamic Workload Console: V8.3 → V8.4 → V8.4 FP1

V8.4:
- Event based scheduling
- Reporting feature
- LDAP and IPv6 support
- SAP job submission (alignment to JSC)
- z/OS 8.3 features alignment

V8.4 FP1:
- Dynamic Critical Path



TWA 2009 Roadmap

1Q09 | 2Q09 | 3Q09 | 4Q09

Tivoli Workload Scheduler for z/OS V8.3: V8.5 → V8.5.1

V8.5:
- Conditional dependencies
- ETT improvements

V8.5.1:
- Graphical Plan Vision and Modeling
- Lightweight E2E Z Driven
- Unified Agent support
- Step Level dependencies
- FIPS 140-2
- Improvements to WebUI zOS coverage

Tivoli Workload Scheduler v8.5: V8.5.0.1 → V8.5.1

V8.5.1:
- Graphical Plan Vision and Modeling
- Unified Agent
- TWS/TDWB Integration
- FIPS 140-2

Tivoli Dynamic Workload Broker v1.2

Tivoli Workload Scheduler for Applications V8.4: V8.5

V8.5:
- Basic Job throttling
- Monitor Alerts
- Solution Manager integration and certification

End of year release
- Coordinated with TWS for z/OS
- Include Interface and Agent updates
- In line with our strategy

Further evolutions
- SOX reporting
- More efficient Java scheduling

We stick to our plans!

We continue to deliver

(*) TWS 8.5.1 includes also TDWB

Agenda

- **Tivoli Workload Automation family**
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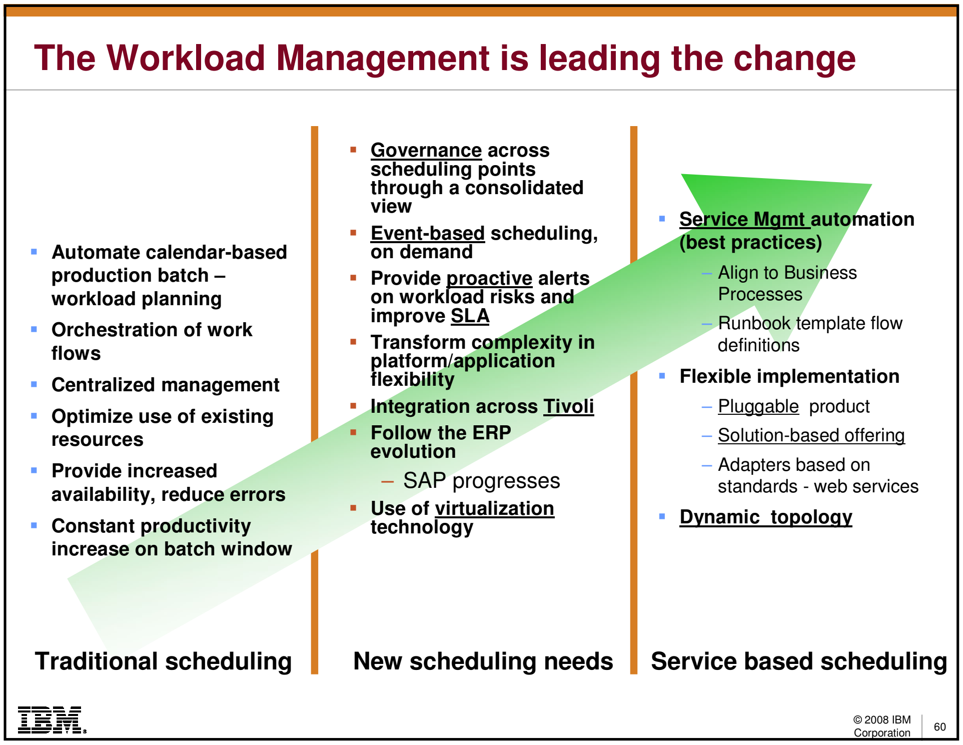
- **Latest and next updates**

➡ **TWA evolution strategy**



The Workload Management is leading the change

- **Automate calendar-based production batch – workload planning**
- **Orchestration of work flows**
- **Centralized management**
- **Optimize use of existing resources**
- **Provide increased availability, reduce errors**
- **Constant productivity increase on batch window**

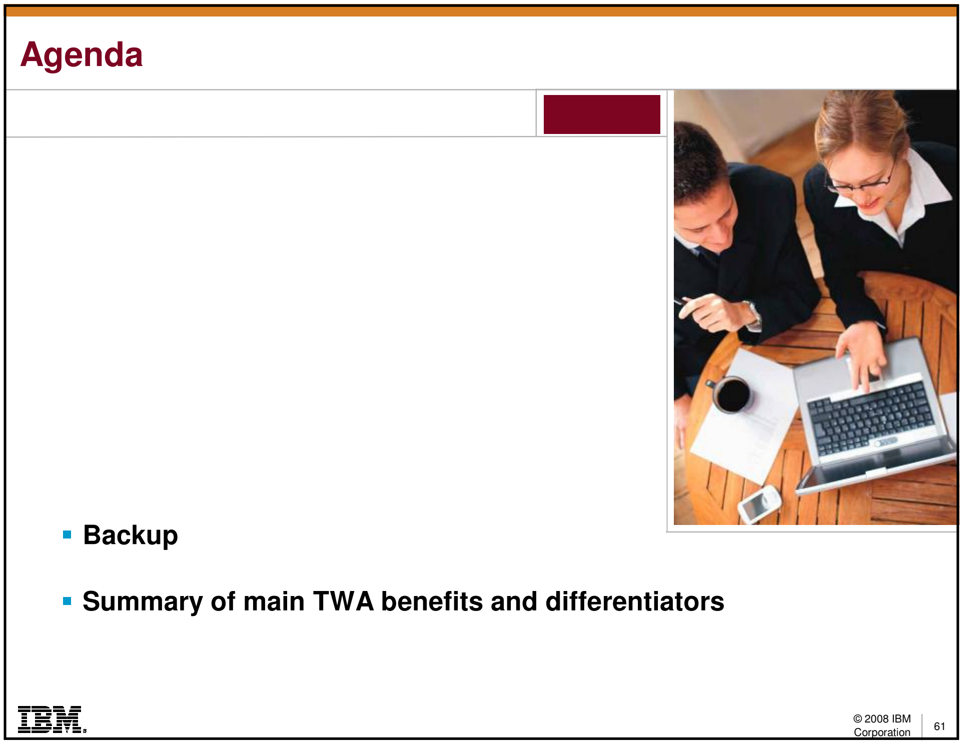
Traditional scheduling

- **Governance across scheduling points through a consolidated view**
- **Event-based scheduling, on demand**
- **Provide proactive alerts on workload risks and improve SLA**
- **Transform complexity in platform/application flexibility**
- **Integration across Tivoli**
- **Follow the ERP evolution**
  - SAP progresses
- **Use of virtualization technology**

New scheduling needs

- **Service Mgmt automation (best practices)**
  - Align to Business Processes
  - Runbook template flow definitions
- **Flexible implementation**
  - Pluggable product
  - Solution-based offering
  - Adapters based on standards - web services
- **Dynamic topology**

Service based scheduling



Agenda

- Backup
- Summary of main TWA benefits and differentiators

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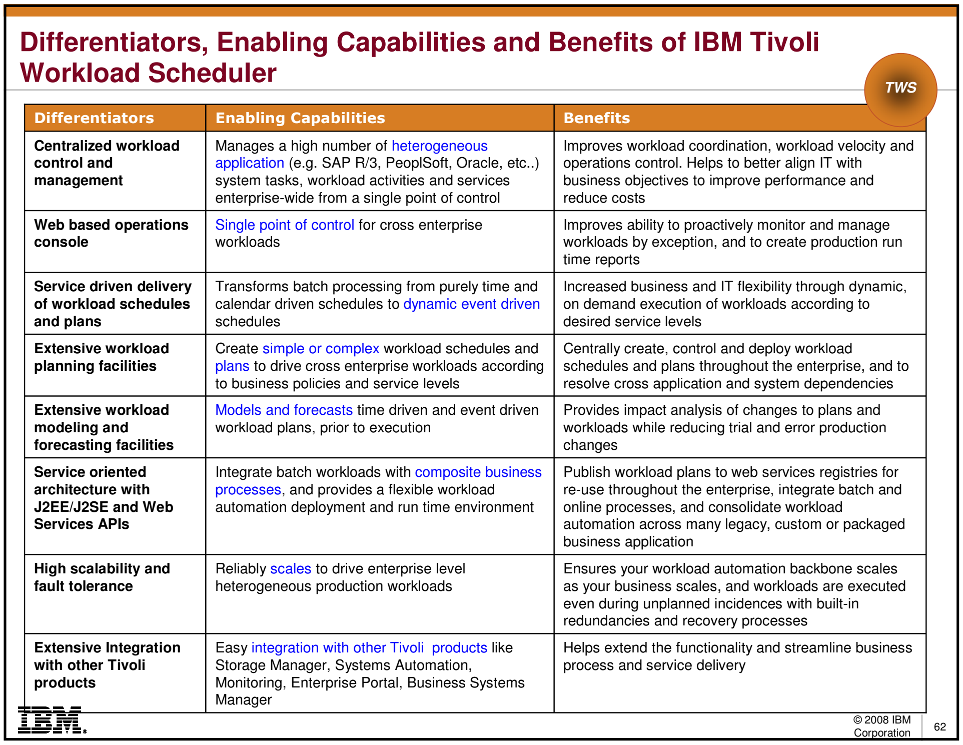

Differentiators, Enabling Capabilities and Benefits of IBM Tivoli Workload Scheduler

TWS

Differentiators	Enabling Capabilities	Benefits
Centralized workload control and management	Manages a high number of heterogeneous application (e.g. SAP R/3, PeoplSoft, Oracle, etc..) system tasks, workload activities and services enterprise-wide from a single point of control	Improves workload coordination, workload velocity and operations control. Helps to better align IT with business objectives to improve performance and reduce costs
Web based operations console	Single point of control for cross enterprise workloads	Improves ability to proactively monitor and manage workloads by exception, and to create production run time reports
Service driven delivery of workload schedules and plans	Transforms batch processing from purely time and calendar driven schedules to dynamic event driven schedules	Increased business and IT flexibility through dynamic, on demand execution of workloads according to desired service levels
Extensive workload planning facilities	Create simple or complex workload schedules and plans to drive cross enterprise workloads according to business policies and service levels	Centrally create, control and deploy workload schedules and plans throughout the enterprise, and to resolve cross application and system dependencies
Extensive workload modeling and forecasting facilities	Models and forecasts time driven and event driven workload plans, prior to execution	Provides impact analysis of changes to plans and workloads while reducing trial and error production changes
Service oriented architecture with J2EE/J2SE and Web Services APIs	Integrate batch workloads with composite business processes, and provides a flexible workload automation deployment and run time environment	Publish workload plans to web services registries for re-use throughout the enterprise, integrate batch and online processes, and consolidate workload automation across many legacy, custom or packaged business application
High scalability and fault tolerance	Reliably scales to drive enterprise level heterogeneous production workloads	Ensures your workload automation backbone scales as your business scales, and workloads are executed even during unplanned incidences with built-in redundancies and recovery processes
Extensive Integration with other Tivoli products	Easy integration with other Tivoli products like Storage Manager, Systems Automation, Monitoring, Enterprise Portal, Business Systems Manager	Helps extend the functionality and streamline business process and service delivery

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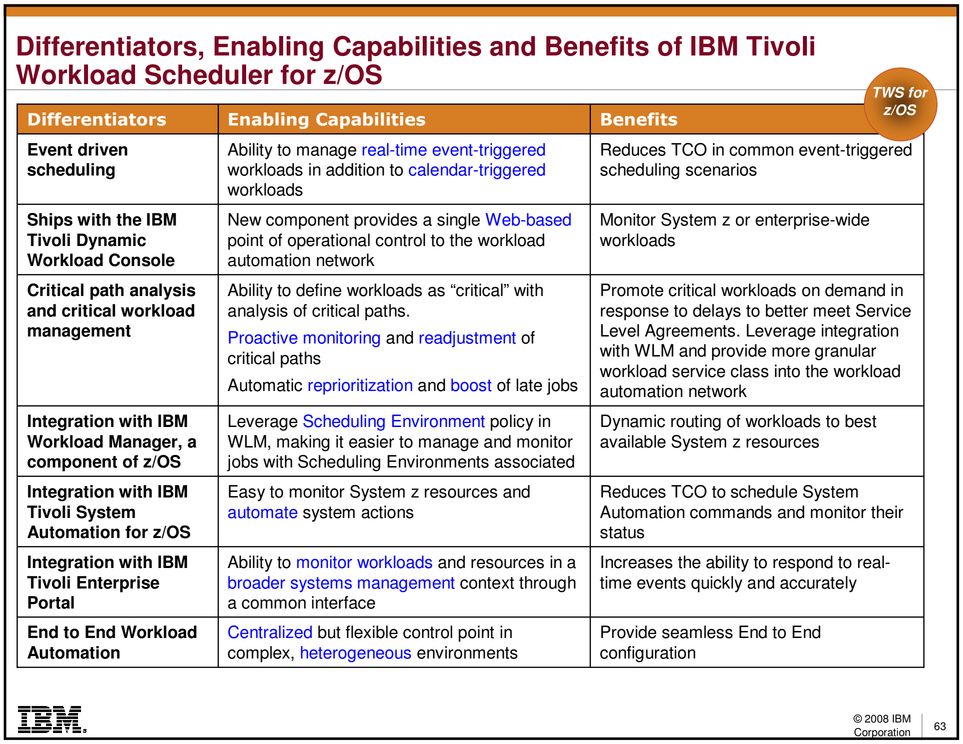
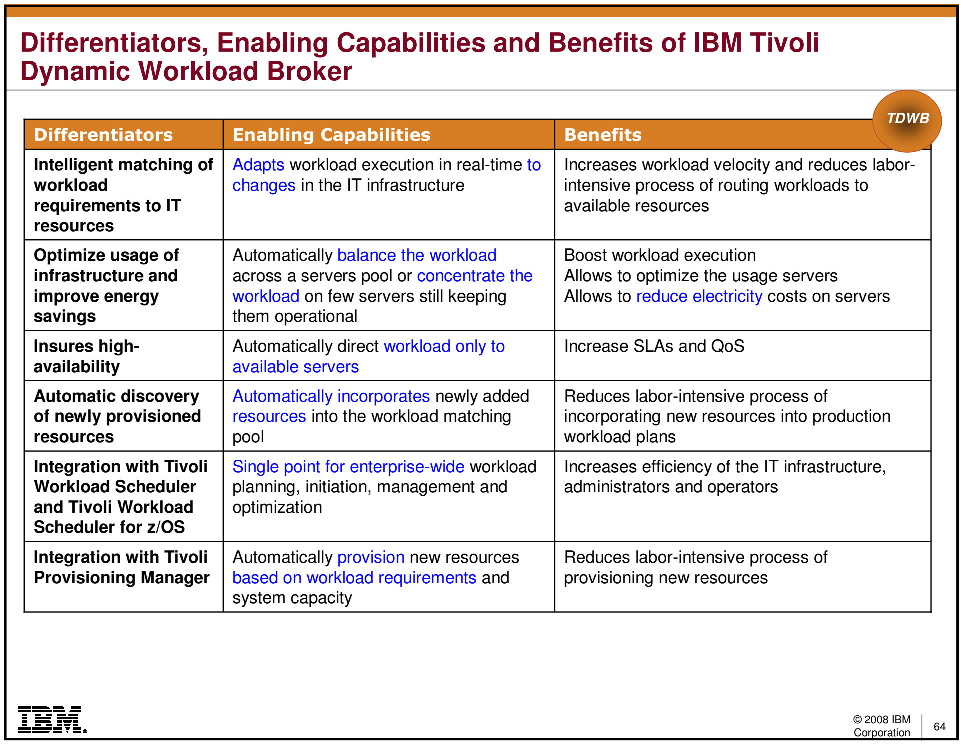


Differentiators, Enabling Capabilities and Benefits of IBM Tivoli Workload Scheduler for z/OS

TWS for z/OS

Differentiators	Enabling Capabilities	Benefits
Event driven scheduling	Ability to manage real-time event-triggered workloads in addition to calendar-triggered workloads	Reduces TCO in common event-triggered scheduling scenarios
Ships with the IBM Tivoli Dynamic Workload Console	New component provides a single Web-based point of operational control to the workload automation network	Monitor System z or enterprise-wide workloads
Critical path analysis and critical workload management	Ability to define workloads as "critical" with analysis of critical paths. Proactive monitoring and readjustment of critical paths Automatic reprioritization and boost of late jobs	Promote critical workloads on demand in response to delays to better meet Service Level Agreements. Leverage integration with WLM and provide more granular workload service class into the workload automation network
Integration with IBM Workload Manager, a component of z/OS	Leverage Scheduling Environment policy in WLM, making it easier to manage and monitor jobs with Scheduling Environments associated	Dynamic routing of workloads to best available System z resources
Integration with IBM Tivoli System Automation for z/OS	Easy to monitor System z resources and automate system actions	Reduces TCO to schedule System Automation commands and monitor their status
Integration with IBM Tivoli Enterprise Portal	Ability to monitor workloads and resources in a broader systems management context through a common interface	Increases the ability to respond to real-time events quickly and accurately
End to End Workload Automation	Centralized but flexible control point in complex, heterogeneous environments	Provide seamless End to End configuration

IBM



Differentiators, Enabling Capabilities and Benefits of IBM Tivoli Dynamic Workload Broker

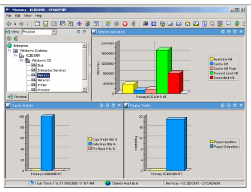
TDWB

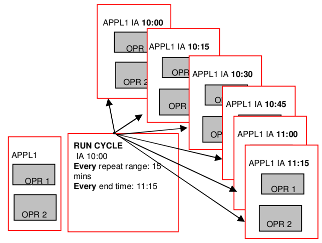
Differentiators	Enabling Capabilities	Benefits
Intelligent matching of workload requirements to IT resources	Adapts workload execution in real-time to changes in the IT infrastructure	Increases workload velocity and reduces labor-intensive process of routing workloads to available resources
Optimize usage of infrastructure and improve energy savings	Automatically balance the workload across a servers pool or concentrate the workload on few servers still keeping them operational	Boost workload execution Allows to optimize the usage servers Allows to reduce electricity costs on servers
Insures high-availability	Automatically direct workload only to available servers	Increase SLAs and QoS
Automatic discovery of newly provisioned resources	Automatically incorporates newly added resources into the workload matching pool	Reduces labor-intensive process of incorporating new resources into production workload plans
Integration with Tivoli Workload Scheduler and Tivoli Workload Scheduler for z/OS	Single point for enterprise-wide workload planning, initiation, management and optimization	Increases efficiency of the IT infrastructure, administrators and operators
Integration with Tivoli Provisioning Manager	Automatically provision new resources based on workload requirements and system capacity	Reduces labor-intensive process of provisioning new resources

IBM

TWS z/OS 8.3 Enhancements

- **Web-Interface**
- **ITM 6.2 Integration**
- **Integration with Workload Manager**
  - Scheduling Environment and Service class on jobs and critical path
- **Enhanced integration with Tivoli System Automation**
  - New Automation workstation
  - Simplified command definition
- **Advanced planning**
  - Every option, Job start delay, enhanced loop analysis
- **Enhanced event-triggered scheduling capabilities**
  - Placeholder variables (e.g., dataset names or dates) from ETT instantiated and resolved values when triggered
  - No limit to number of occurrences per application
- **FTA/SA directly connected to the E2E**

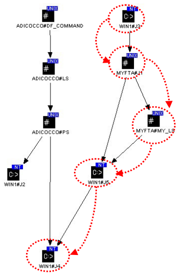


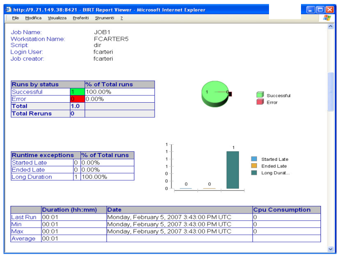


Cyclic planning of jobs

TWS z/OS 8.3 – Small Program Enhancements

- **Windows users Password Encryption in E2E**
- **TCP/IP Connection**
  - All connections (Trackers ISPF dialogs, APIs) can be configured to use TCP/IP in addition to SNA and XCF
- **Virtual Workstation**
- **NOERROR enhancements**
  - Relational operators in NOERROR statements
  - New specific entry: jobname.stepname.procstepname.errorcode.operator
  - Easy way to specify a range
  - New FLSH error code
  - New extended status
- **Reporting feature**
- **Dynamic Critical Path**




http://9.71.149.38:8421 - BIRT Report Viewer - Microsoft Internet Explorer
File Modifica Visualizza Preferiti Strumenti ?

Job Name: JOB1
Workstation Name: FCARTER5
Script: dir
Login User: fcarteri
Job creator: fcarteri

Runs by status		% of Total runs
Successful	1	100.00%
Error	0	0.00%
Total	**1.0**	
Total Reruns	**0**	

Runtime exceptions		% of Total runs
Started Late	0	0.00%
Ended Late	0	0.00%
Long Duration	1	100.00%

1
1
1
1
0
0
0
0
0
1
Started Late
Ended Late
Long Durat...

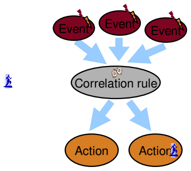
	Duration (hh:mm)	Date	Cpu Consumption
Last Run	00:01	Monday, February 5, 2007 3:43:00 PM UTC	0
Min	00:01	Monday, February 5, 2007 3:43:00 PM UTC	0
Max	00:01	Monday, February 5, 2007 3:43:00 PM UTC	0
Average	00:01		

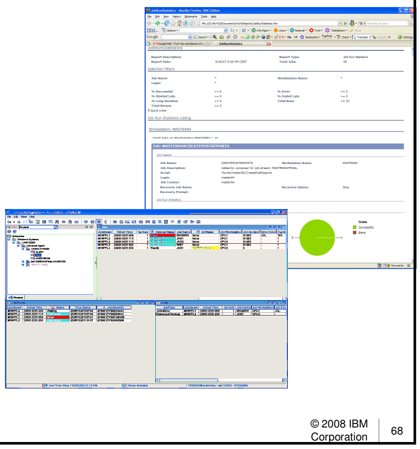
TWS z/OS 8.5

- **Conditional Dependencies**
  - Define logical conditions using boolean expressions on jobs status and return codes
- **Enhance Event Management: event-triggering variations and simplification**
  - Automate dataset triggering tables creation and deployment
  - Considering a larger set of basic events improving current dataset triggering functionality
  - Monitoring the HFS files on USS z/OS side.
  - Monitoring the file creation on E2E side.
- **Improve JCL Variables/Directive**
  - Ability to substring variables in JCL
  - Improve SETVAR directive to calculate last day or workday of future or previous months
  - Ability to remove JCL directives prior to submitting the resulting JCL
  - Ability to cause a job not to run (NOP it) via a new directive to be inserted in the JCL
- **Time dependent operations new user exit**
  - A new user exit, will be invoked for time dependent jobs to provide an offset (negative or positive) to be added or subtracted to its IA time when deciding if time constraint has been satisfied or not

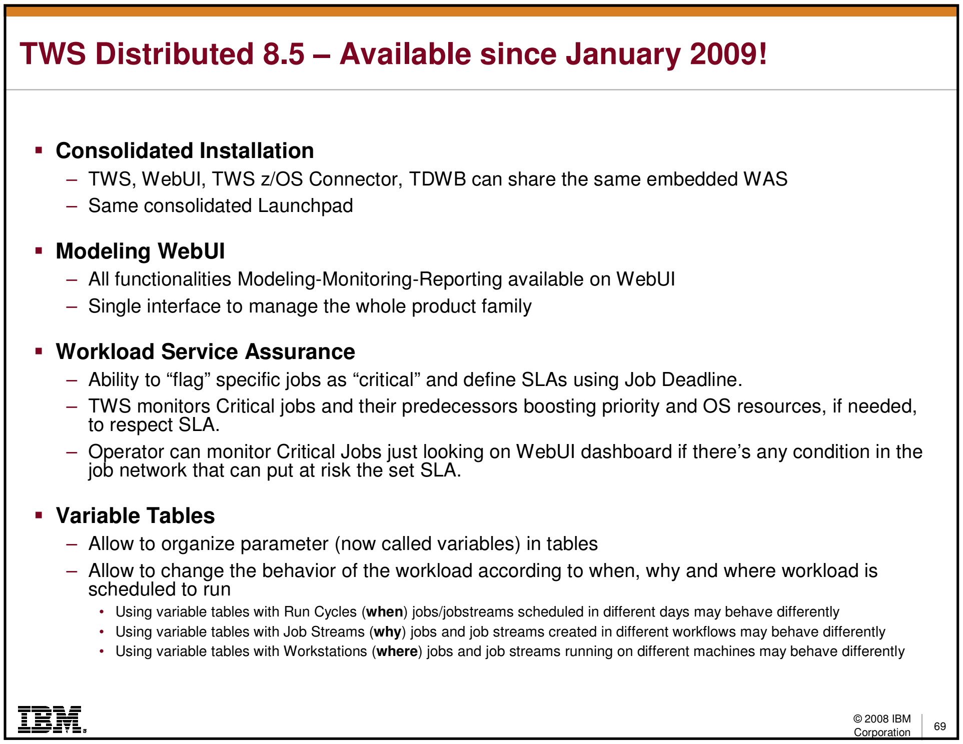
TWS Distributed 8.4

- **Event Driven Workload Automation**
  - Event Triggered Workload and Runbook automation
  - Notifications and Ticketing
- **ITM 6.2 Integration**
  - TWS health monitoring via TEP
- **Enhanced WebUI**
  - Reporting on Historical data and Custom reports on DB
  - Analysis of TWS plans with Microsoft Project
- **IPv6 support**



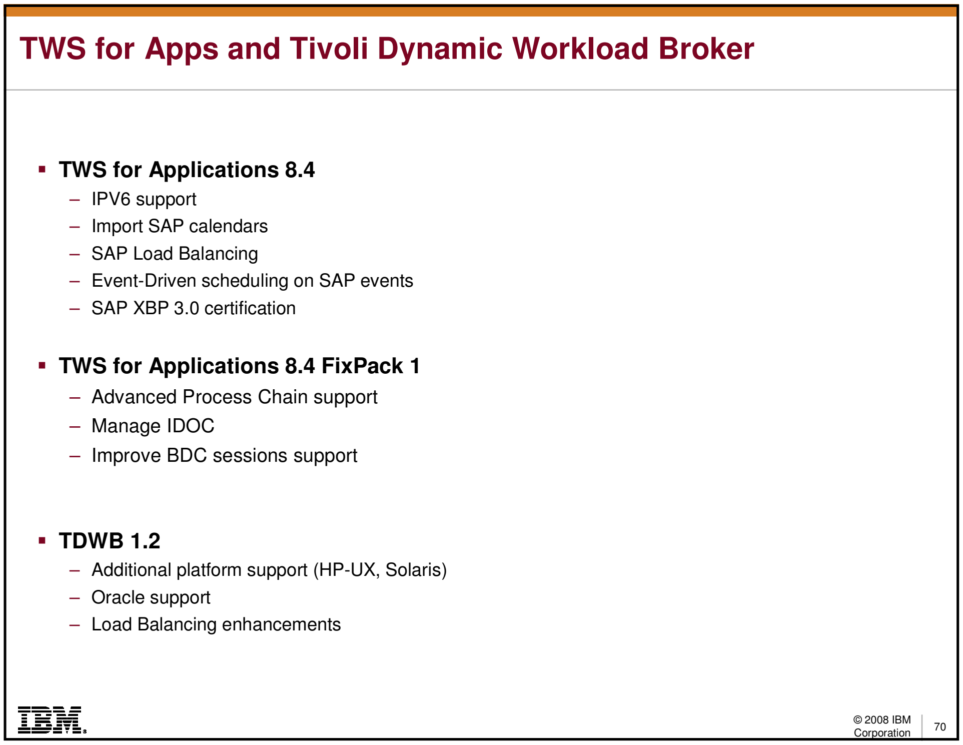


- **TWS 8.4 Fixpack 1**
  - CCMDB integration for Change Management Scenarios with Maximo
  - TWS Integration Workbench
    - EDWA Event and Action Plug-ins
    - API Application



TWS Distributed 8.5 – Available since January 2009!

- **Consolidated Installation**
  - TWS, WebUI, TWS z/OS Connector, TDWB can share the same embedded WAS
  - Same consolidated Launchpad
- **Modeling WebUI**
  - All functionalities Modeling-Monitoring-Reporting available on WebUI
  - Single interface to manage the whole product family
- **Workload Service Assurance**
  - Ability to “flag” specific jobs as “critical” and define SLAs using Job Deadline.
  - TWS monitors Critical jobs and their predecessors boosting priority and OS resources, if needed, to respect SLA.
  - Operator can monitor Critical Jobs just looking on WebUI dashboard if there’s any condition in the job network that can put at risk the set SLA.
- **Variable Tables**
  - Allow to organize parameter (now called variables) in tables
  - Allow to change the behavior of the workload according to when, why and where workload is scheduled to run
    - Using variable tables with Run Cycles (**when**) jobs/jobstreams scheduled in different days may behave differently
    - Using variable tables with Job Streams (**why**) jobs and job streams created in different workflows may behave differently
    - Using variable tables with Workstations (**where**) jobs and job streams running on different machines may behave differently



TWS for Apps and Tivoli Dynamic Workload Broker

- **TWS for Applications 8.4**
  - IPV6 support
  - Import SAP calendars
  - SAP Load Balancing
  - Event-Driven scheduling on SAP events
  - SAP XBP 3.0 certification
- **TWS for Applications 8.4 FixPack 1**
  - Advanced Process Chain support
  - Manage IDOC
  - Improve BDC sessions support
- **TDWB 1.2**
  - Additional platform support (HP-UX, Solaris)
  - Oracle support
  - Load Balancing enhancements

Tivoli Workload Automation family

Improving IT efficiency, performance, and costs
to accelerate and sustain business growth