IBM Tivoli Software – IBM Tivoli Workload Automation

# Manage mission-critical workloads with workload service assurance

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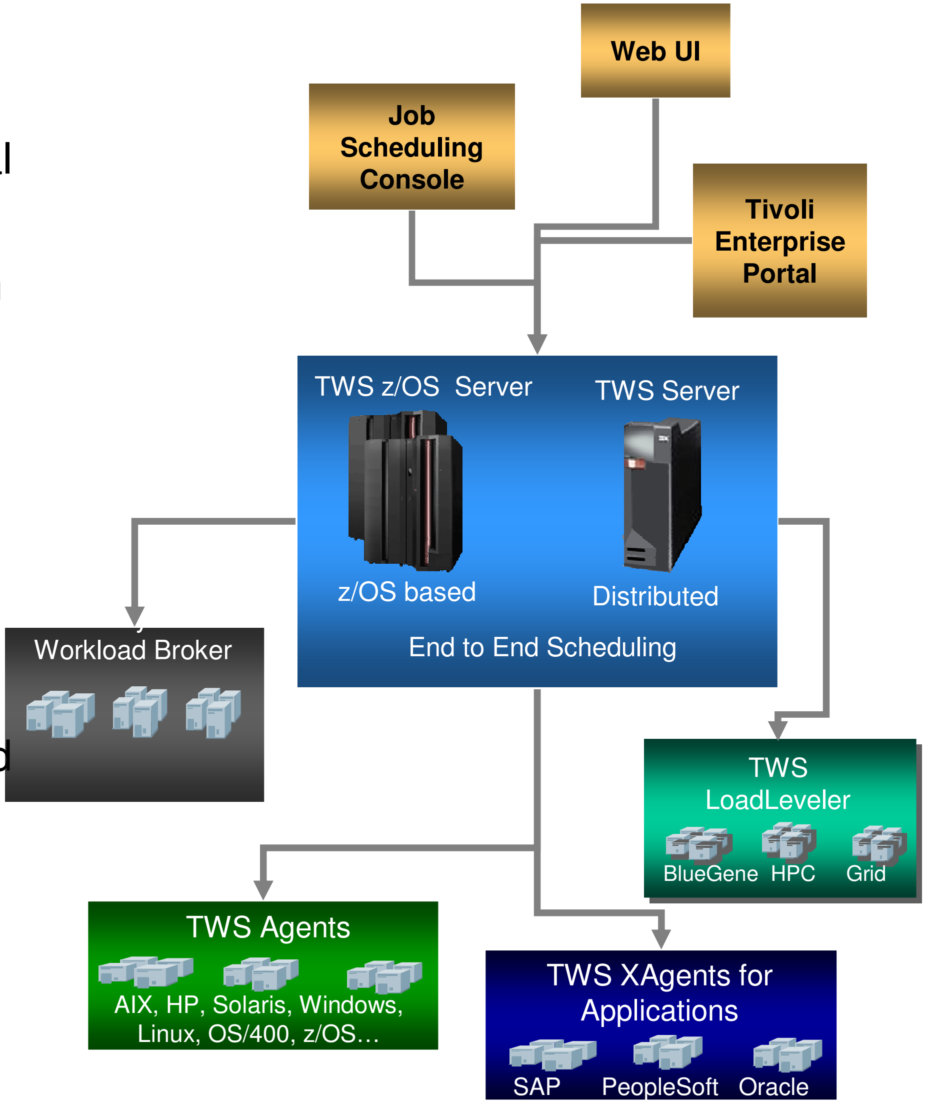
# Agenda

- **IBM Tivoli Workload Automation modern challenges**
- **Workload Service Assurance on Tivoli Workload Scheduler for z/OS**
- **Enterprise JavaBeans and Web Services interface**
- **Reporting capability on Tivoli Dynamic Workload Console**
- **Other recent updates on Tivoli Workload Scheduler for z/OS**

# IBM Tivoli Workload Automation

- *Single solution to integrate composite workloads* across multiple platforms and applications into a single point of operational and management control
- *SLA-based* control of any workload, through *Workload Service Assurance service*
- Exposure of scheduling services *on SOA* through *EJB interface and Web Services*
- *Governance* across scheduling points through a consolidated view for management, control and *reporting*
- *Dynamic real-time workload and resource utilization optimization* to maximize workload velocity into existing resources
- *Autonomic and self-managing* through new automation layer
- *Integrate with systems mgmt solutions*



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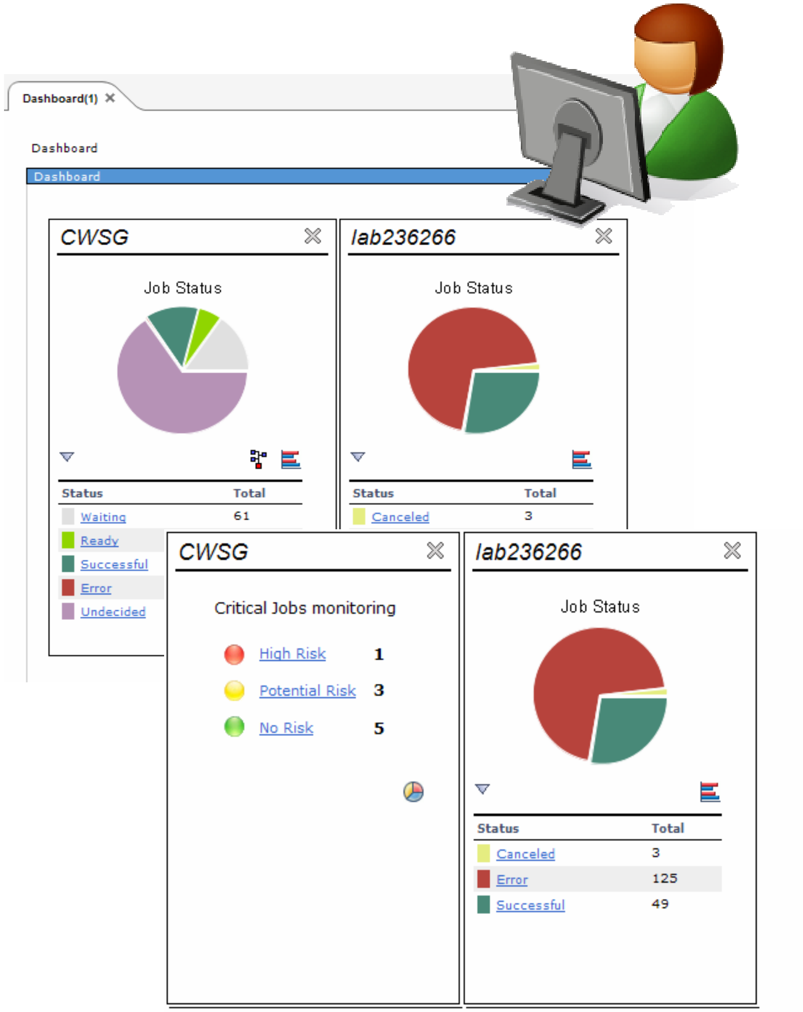
# Workload Service Assurance: *The solution*

| | |
|---|---|
| ***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),<br>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 — Job Status

| Status | Total |
|---|---|
| Waiting | 61 |
| Ready | |
| Successful | |
| Error | |
| Undecided | |

lab236266 — Job Status

| Status | Total |
|---|---|
| Canceled | 3 |

CWSG — Critical Jobs monitoring

| | |
|---|---|
| ● High Risk | 1 |
| ● Potential Risk | 3 |
| ● No Risk | 5 |

lab236266 — Job Status

| Status | Total |
|---|---|
| Canceled | 3 |
| Error | 125 |
| Successful | 49 |

# Workload Service Assurance: *Customer value*

- Alignment of workload to *business priorities*
- *Service Level* management, automate operations and reduce costs
- *Forecasting* expected completion of jobs, taking in account *historical metrics* and *indicators*
- Monitoring the *most current critical path*
- Automating *remedial actions* as first reaction to *risk*
- *Proactive* alerting of users about *potentially risk conditions*
- Forwarding information to *TEP and TBSM*

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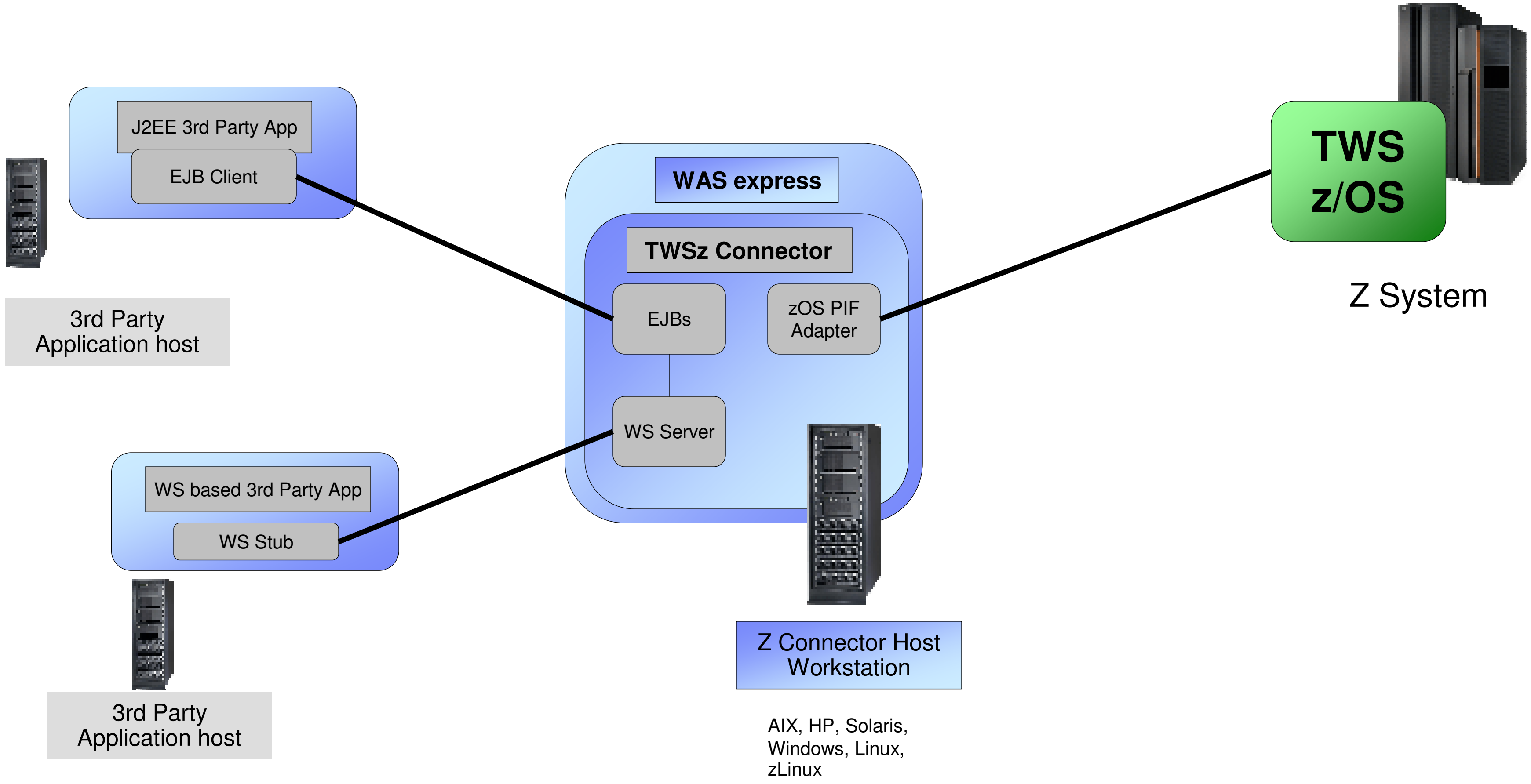
# zConnector: *Exposes TWS services to EJB and Web interfaces*



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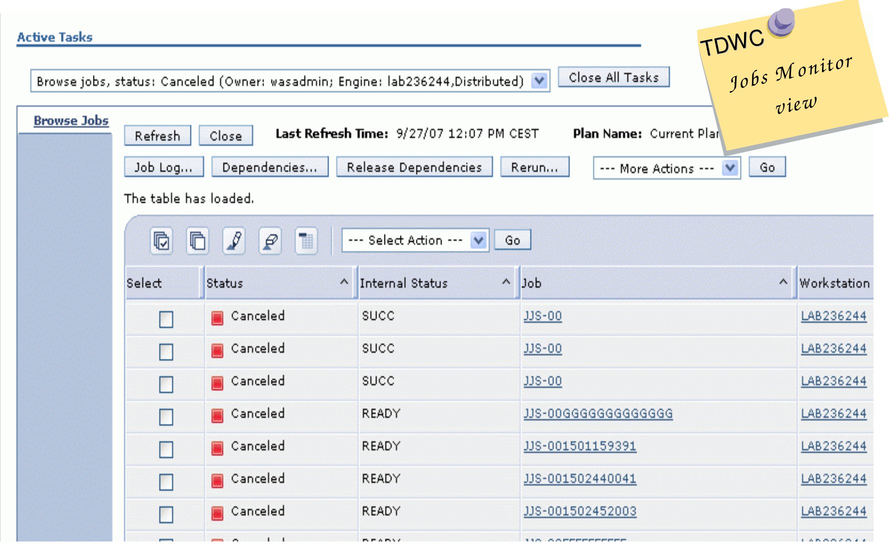
# Tivoli Dynamic Workload Console

- *Single point of monitoring and management* for the entire batch workload and batch environments – Tivoli Dynamic Workload Console (TDWC)
  - 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

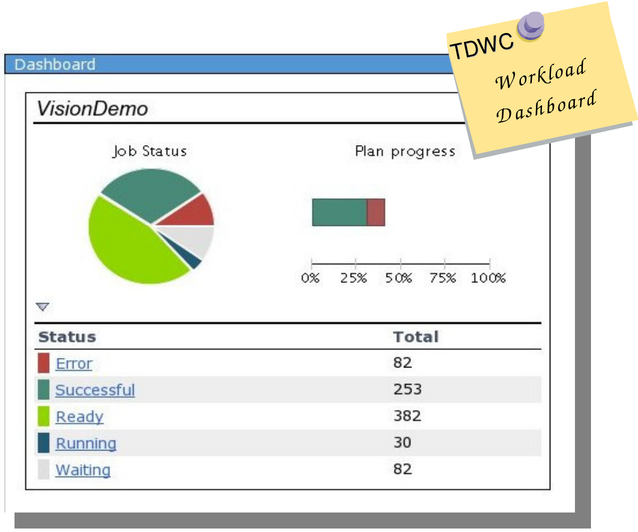
Browse jobs, status: Canceled (Owner: wasadmin; Engine: lab236244,Distributed)

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

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 | JJS-001502440041 | LAB236244 |
| □ | 🟥 Canceled | READY | JJS-001502452003 | LAB236244 |

TDWC
Jobs Monitor view



Dashboard

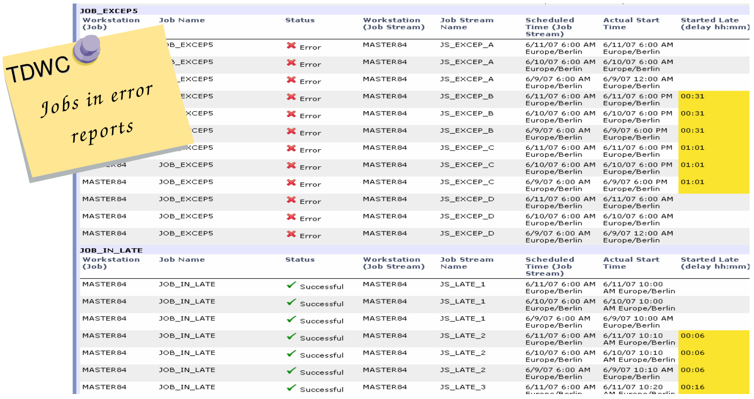
VisionDemo

| Status | Total |
|---|---|
| 🟥 Error | 82 |
| 🟩 Successful | 253 |
| 🟩 Ready | 382 |
| 🟦 Running | 30 |
| ⬜ Waiting | 82 |

TDWC
Workload Dashboard

# Tivoli Dynamic Workload Console: *Reporting feature*

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



TDWC

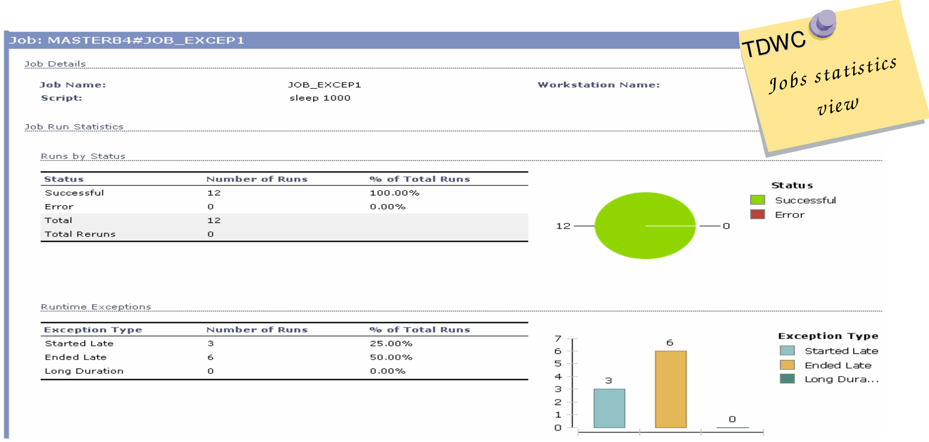
*Jobs in error reports*

**JOB_EXCEP5**

| Workstation (Job) | Job Name | Status | Workstation (Job Stream) | Job Stream Name | Scheduled Time (Job Stream) | Actual Start Time | Started Late (delay hh:mm) |
|---|---|---|---|---|---|---|---|
| | B_EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_A | 6/11/07 6:00 AM Europe/Berlin | 6/11/07 6:00 AM Europe/Berlin | |
| | _EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_A | 6/10/07 6:00 AM Europe/Berlin | 6/10/07 6:00 AM Europe/Berlin | |
| | _EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_A | 6/9/07 6:00 AM Europe/Berlin | 6/9/07 12:00 AM Europe/Berlin | |
| | XCEP5 | ✗ Error | MASTER84 | JS_EXCEP_B | 6/11/07 6:00 AM Europe/Berlin | 6/11/07 6:00 PM Europe/Berlin | 00:31 |
| | XCEP5 | ✗ Error | MASTER84 | JS_EXCEP_B | 6/10/07 6:00 AM Europe/Berlin | 6/10/07 6:00 PM Europe/Berlin | 00:31 |
| | CEP5 | ✗ Error | MASTER84 | JS_EXCEP_B | 6/9/07 6:00 AM Europe/Berlin | 6/9/07 6:00 PM Europe/Berlin | 00:31 |
| | XCEP5 | ✗ Error | MASTER84 | JS_EXCEP_C | 6/11/07 6:00 AM Europe/Berlin | 6/11/07 6:00 PM Europe/Berlin | 01:01 |
| ER84 | JOB_EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_C | 6/10/07 6:00 AM Europe/Berlin | 6/10/07 6:00 PM Europe/Berlin | 01:01 |
| MASTER84 | JOB_EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_C | 6/9/07 6:00 AM Europe/Berlin | 6/9/07 6:00 PM Europe/Berlin | 01:01 |
| MASTER84 | JOB_EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_D | 6/11/07 6:00 AM Europe/Berlin | 6/11/07 6:00 AM Europe/Berlin | |
| MASTER84 | JOB_EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_D | 6/10/07 6:00 AM Europe/Berlin | 6/10/07 6:00 AM Europe/Berlin | |
| MASTER84 | JOB_EXCEP5 | ✗ Error | MASTER84 | JS_EXCEP_D | 6/9/07 6:00 AM Europe/Berlin | 6/9/07 12:00 AM Europe/Berlin | |

**JOB_IN_LATE**

| Workstation (Job) | Job Name | Status | Workstation (Job Stream) | Job Stream Name | Scheduled Time (Job Stream) | Actual Start Time | Started Late (delay hh:mm) |
|---|---|---|---|---|---|---|---|
| MASTER84 | JOB_IN_LATE | ✓ Successful | MASTER84 | JS_LATE_1 | 6/11/07 6:00 AM Europe/Berlin | 6/11/07 10:00 AM Europe/Berlin | |
| MASTER84 | JOB_IN_LATE | ✓ Successful | MASTER84 | JS_LATE_1 | 6/10/07 6:00 AM Europe/Berlin | 6/10/07 10:00 AM Europe/Berlin | |
| MASTER84 | JOB_IN_LATE | ✓ Successful | MASTER84 | JS_LATE_1 | 6/9/07 6:00 AM Europe/Berlin | 6/9/07 10:00 AM Europe/Berlin | |
| MASTER84 | JOB_IN_LATE | ✓ Successful | MASTER84 | JS_LATE_2 | 6/11/07 6:00 AM Europe/Berlin | 6/11/07 10:10 AM Europe/Berlin | 00:06 |
| MASTER84 | JOB_IN_LATE | ✓ Successful | MASTER84 | JS_LATE_2 | 6/10/07 6:00 AM Europe/Berlin | 6/10/07 10:10 AM Europe/Berlin | 00:06 |
| MASTER84 | JOB_IN_LATE | ✓ Successful | MASTER84 | JS_LATE_2 | 6/9/07 6:00 AM Europe/Berlin | 6/9/07 10:10 AM Europe/Berlin | 00:06 |
| MASTER84 | JOB_IN_LATE | ✓ Successful | MASTER84 | JS_LATE_3 | 6/11/07 6:00 AM Europe/Berlin | 6/11/07 10:20 AM Europe/Berlin | 00:16 |



TDWC

*Jobs statistics view*

**Job: MASTER84#JOB_EXCEP1**

Job Details

Job Name: JOB_EXCEP1

Script: sleep 1000

Workstation Name:

Job Run Statistics

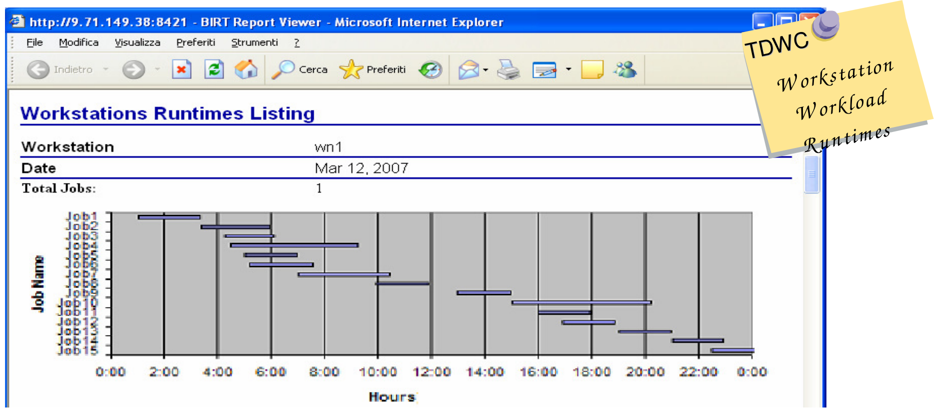
Runs by Status

| Status | Number of Runs | % of Total Runs |
|---|---|---|
| Successful | 12 | 100.00% |
| Error | 0 | 0.00% |
| Total | 12 | |
| Total Reruns | 0 | |

Runtime Exceptions

| Exception Type | Number of Runs | % of Total Runs |
|---|---|---|
| Started Late | 3 | 25.00% |
| Ended Late | 6 | 50.00% |
| Long Duration | 0 | 0.00% |

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



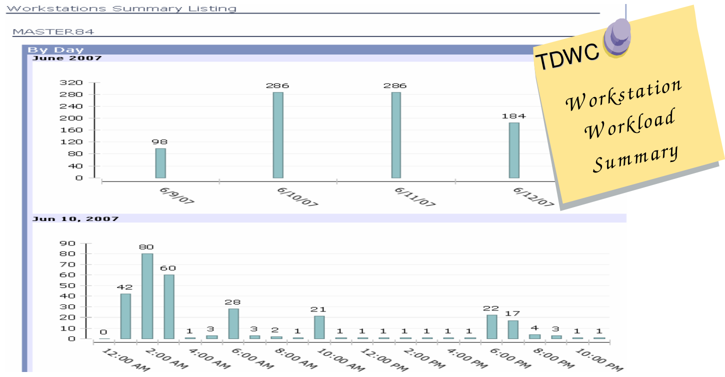
http://9.71.149.38:8421 - BIRT Report Viewer - Microsoft Internet Explorer
File
Modifica
Visualizza
Preferiti
Strumenti
?
Indietro
Cerca
Preferiti

**Workstations Runtimes Listing**

| | |
|---|---|
| Workstation | wn1 |
| Date | Mar 12, 2007 |
| Total Jobs: | 1 |

TDWC

*Workstation Workload Runtimes*



Workstations Summary Listing

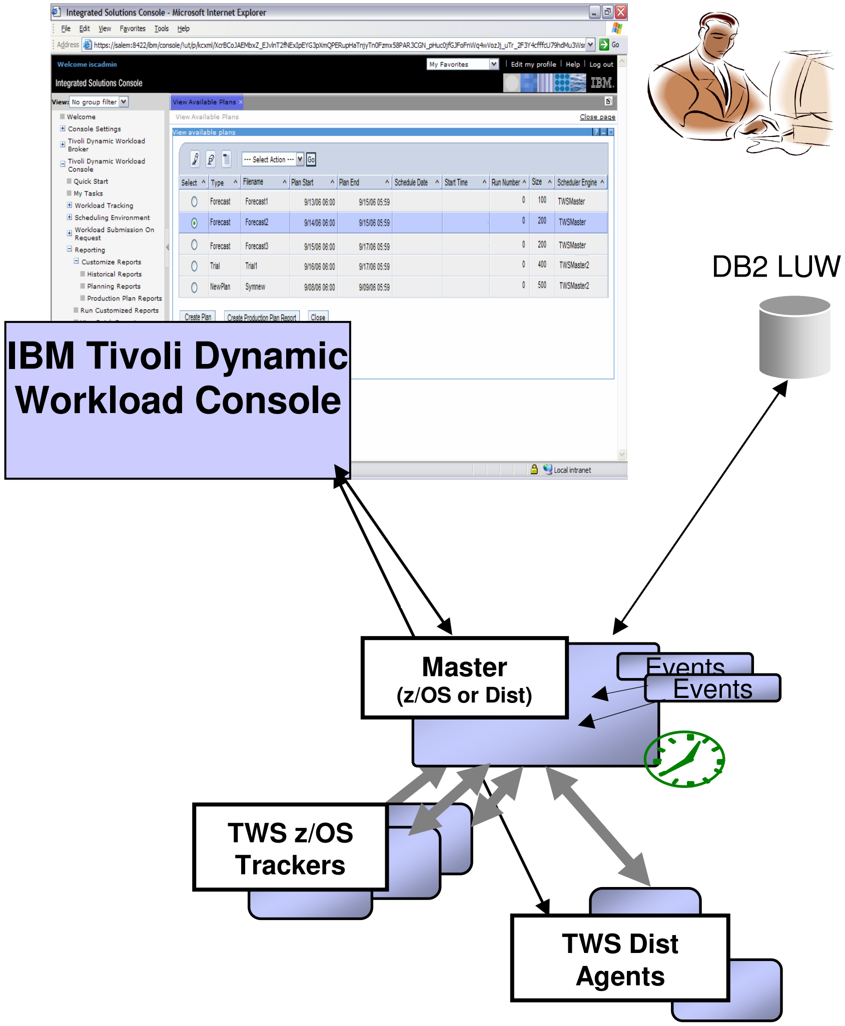
MASTER84

By Day

TDWC

*Workstation Workload Summary*

# Reporting feature: *Customer value*



View available plans

| Select | Type | Filename | Plan Start | Plan End | Schedule Date | Start Time | Run Number | Size | Scheduler Engine |
|---|---|---|---|---|---|---|---|---|---|
| ○ | Forecast | Forecast1 | 9/13/06 06:00 | 9/15/06 05:59 | | | 0 | 100 | TWSMaster |
| ● | Forecast | Forecast2 | 9/14/06 06:00 | 9/15/06 05:59 | | | 0 | 200 | TWSMaster |
| ○ | Forecast | Forecast3 | 9/15/06 06:00 | 9/17/06 05:59 | | | 0 | 200 | TWSMaster |
| ○ | Trial | Trial1 | 9/16/06 06:00 | 9/17/06 05:59 | | | 0 | 400 | TWSMaster2 |
| ○ | NewPlan | Symnew | 9/08/06 06:00 | 9/09/06 05:59 | | | 0 | 500 | TWSMaster2 |

IBM Tivoli Dynamic Workload Console

DB2 LUW

Master
(z/OS or Dist)

Events

Events

TWS z/OS Trackers

TWS Dist Agents

- Job Run History
  - *Measure business compliance and SLAs*
- Job Run Statistics
  - *Workload schedule forecasting*
- Workstation workload summary
  - *Capacity planning adjustements*
- Workstation workload runtime
  - *Monitor and tune workload capacity*

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# “Virtual” Workstation

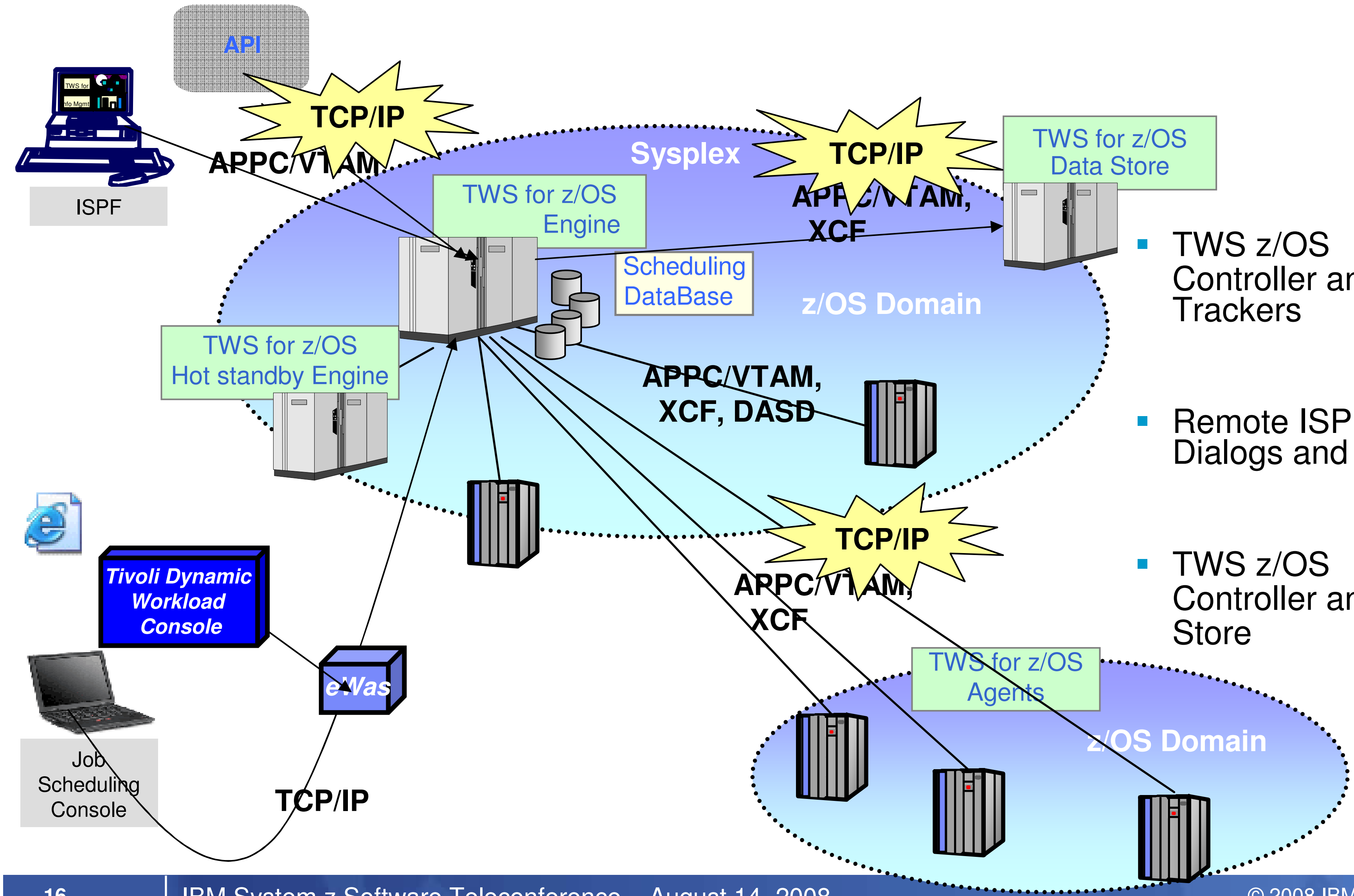
## Virtual Workstation

- Eliminates one to one constraint with Workstation and Destination
- Allows a single Workstation to submit to multiple destinations
- Each destination has its own availability info
- TWS will submit work in sequence around eligible destinations
- This implicitly implements alternate workstations
- This means you can make a workstation follow resource movements either planned or unplanned

## Customer value

- Easy exploitation of the SYSPLEX
- Elimination of bottleneck at workload submission
- Dynamic routing of workload to best available resources

# TCP/IP Protocol support



- TWS z/OS Controller and z/OS Trackers
- Remote ISPF Dialogs and PIF
- TWS z/OS Controller and Data Store

# Questions ?