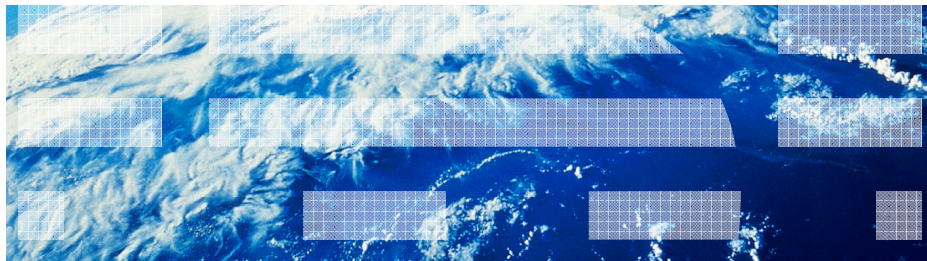
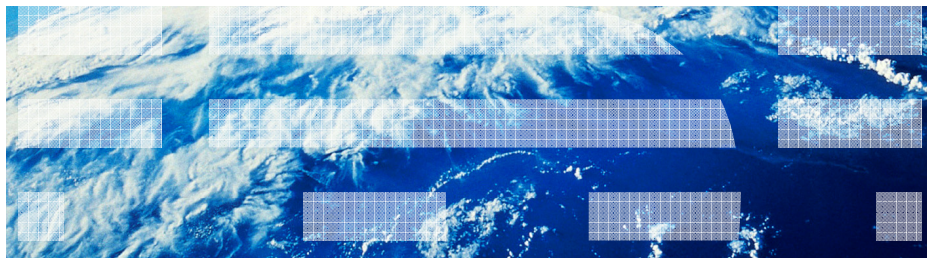


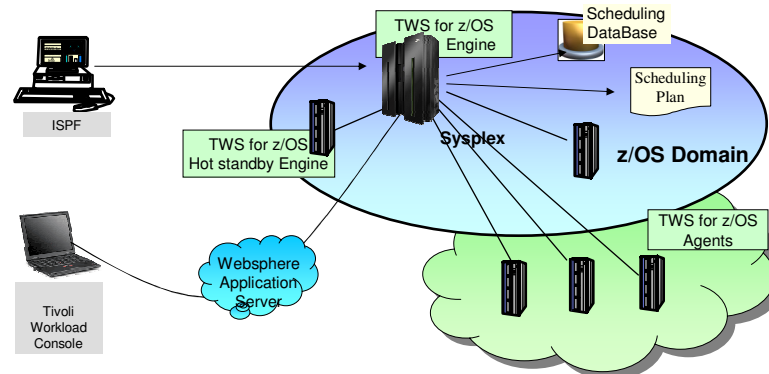
TWS for z/OS V8.6 New Features



TWS Configurations Overview

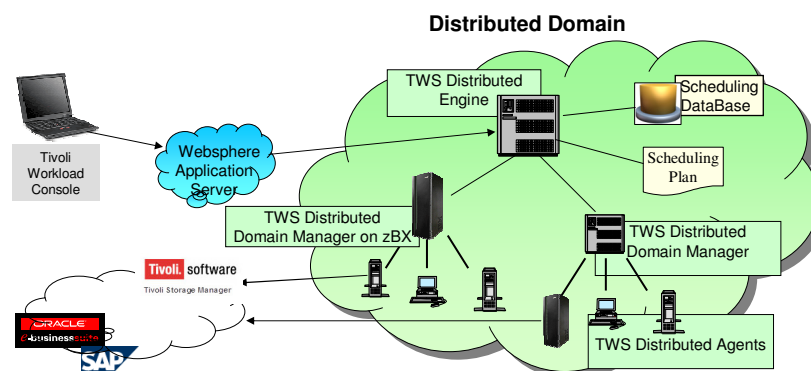


TWS z/OS Configuration



- Centralized Modeling and Control for z/OS only scheduling
- TWS for z/OS Engine
 - Owns the scheduling database, drives all the scheduling activities, and implements all Scheduling control logic
- TWS for z/OS Server
 - Manages communication with TWS components located outside the Controller Address Space
- TWS for z/OS Agents
 - Receives jobs to be executed by Engine, interface JES and SMF, sends back events to the Engine.
 - Connected to Engine via XCF, Shared DASD, TCPIP or SNA.

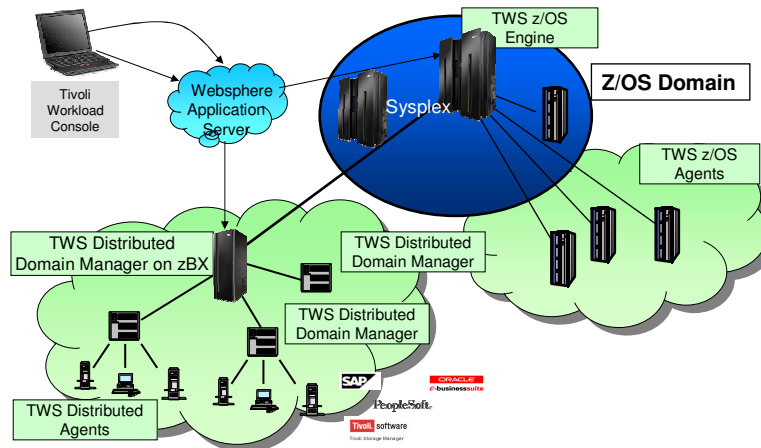
TWS Distributed Hybrid Configuration



- Centralized Modeling and Control for Distributed only scheduling
- TWS Distributed Engine
 - Owns the scheduling database, collects events from the underlying Agents and resolves cross-domain dependencies
- TWS Distributed Agents
 - Intelligent agents capable to work autonomously
 - Connectivity to ERP applications

TWS End-to-End Hybrid Configuration Plan Based end to end

IBM Tivoli software



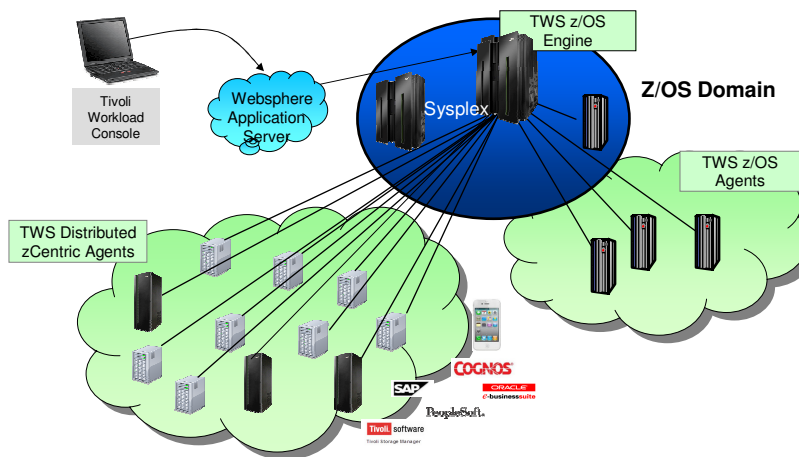
- Centralized Modeling and Control from z/OS environment for all Enterprise scheduling (z/OS and Distributed)

4

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TWS End-to-End Hybrid Configuration zCentric end to end

IBM Tivoli software



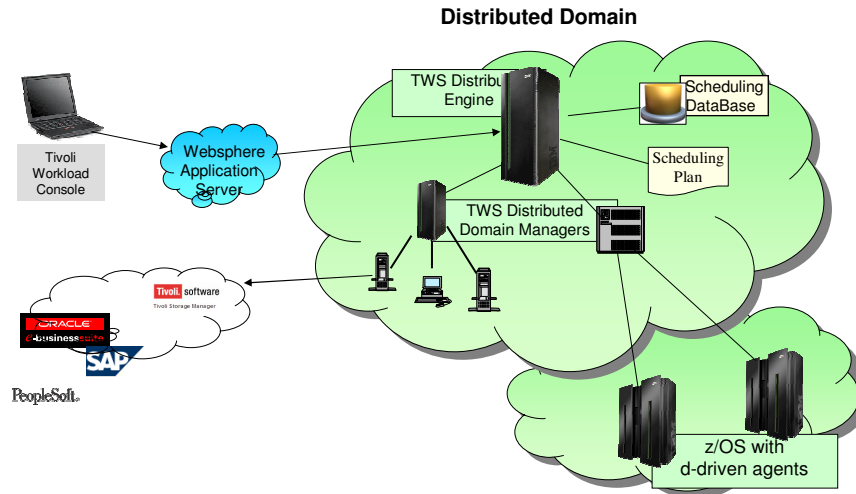
- Centralized Modeling and Control from z/OS environment simple http protocol

5

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TWS End-to-End Hybrid Configuration d-Driven end to end

IBM Tivoli software



- Manage small z/OS batch environments through a Distributed Master Domain Manager

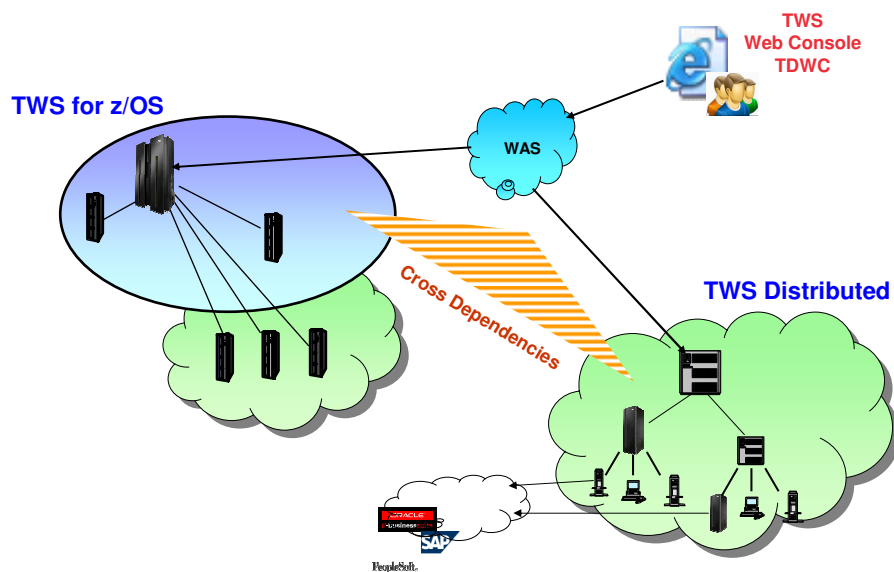
6

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6

Mixed TWS End to End Configuration

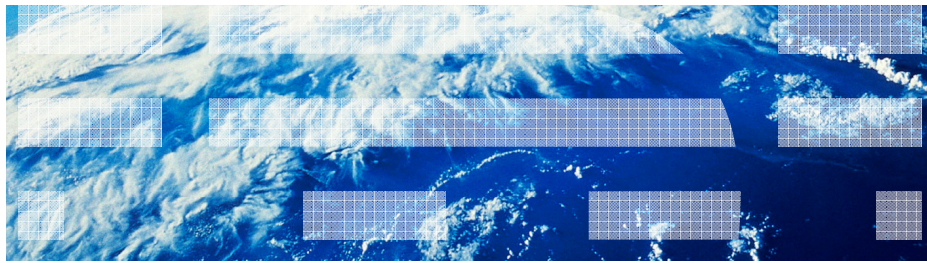
IBM Tivoli software



7

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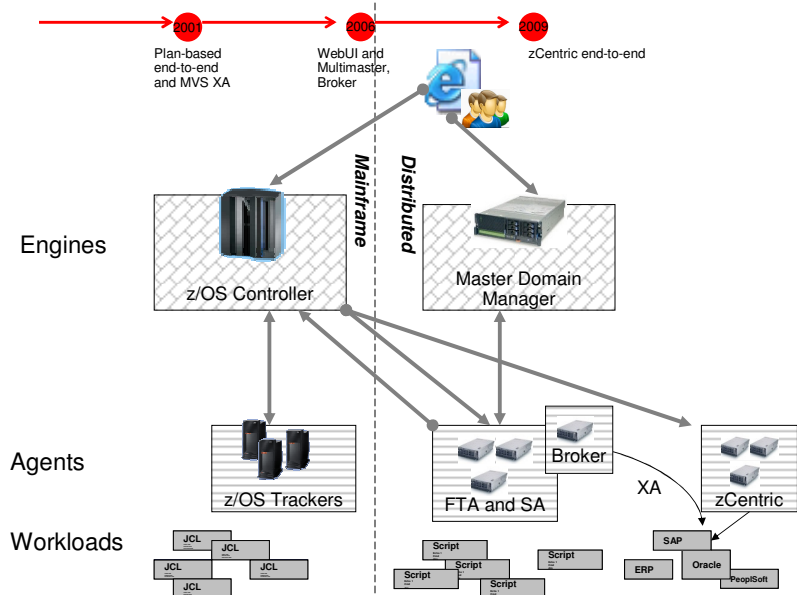
End to End Continued Evolution



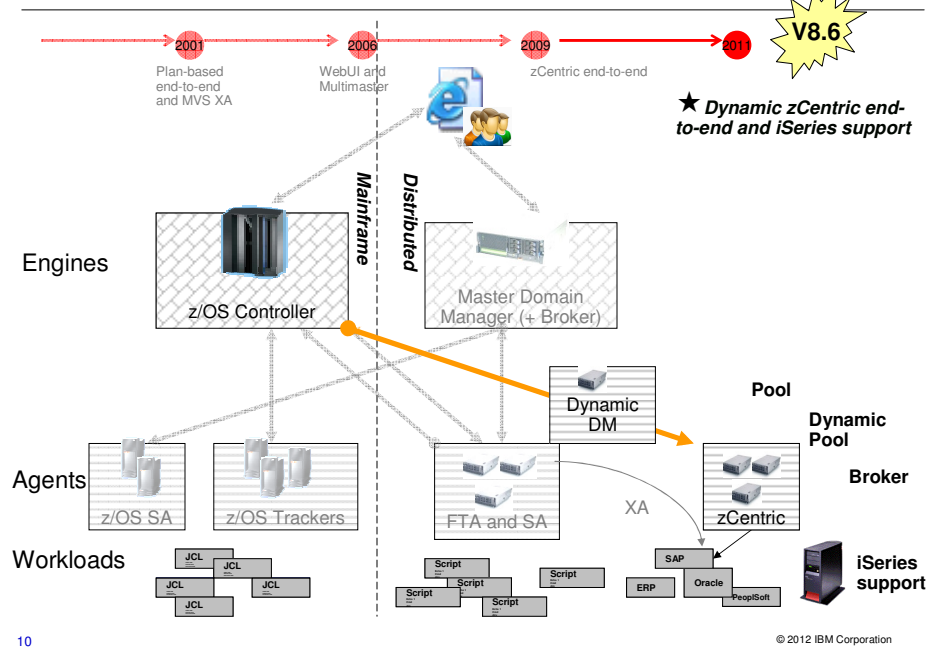
Tivoli software

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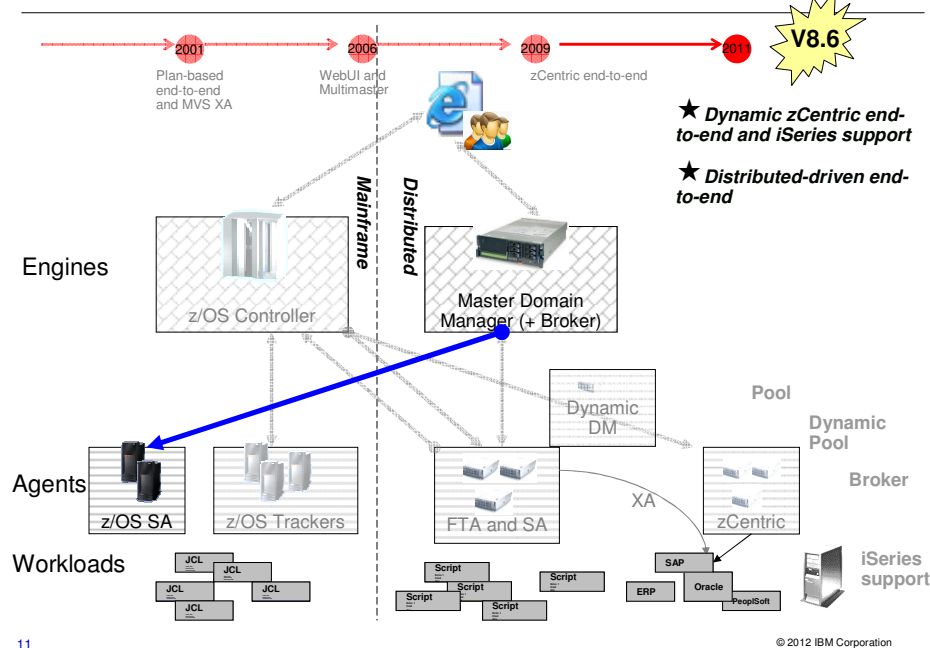
How Version 8.6 contributes to the end-to-end evolution **Tivoli** software



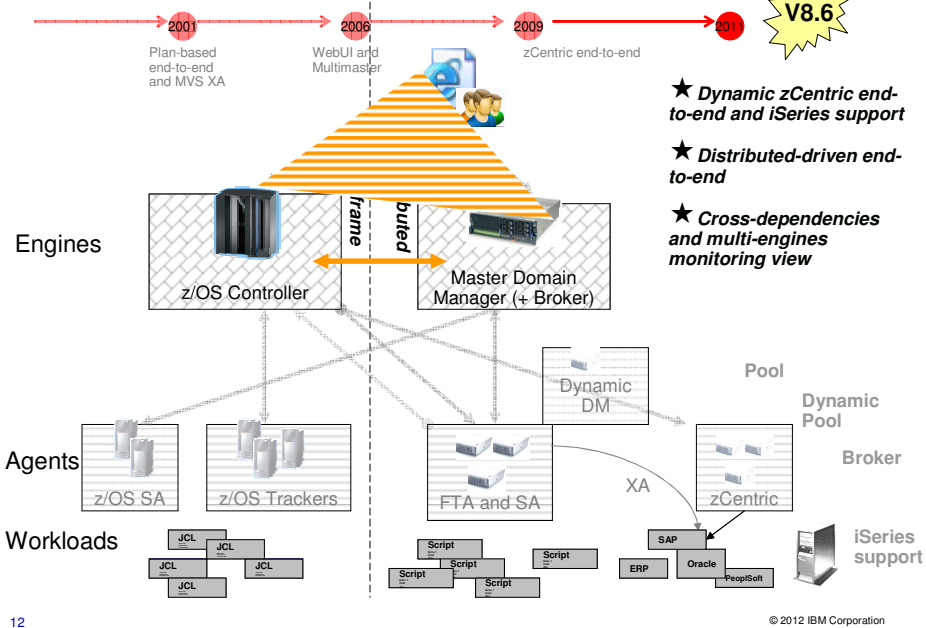
How Version 8.6 contributes to the end-to-end evolution software



How Version 8.6 contributes to the end-to-end evolution software



How Version 8.6 contributes to the end-to-end evolution



12

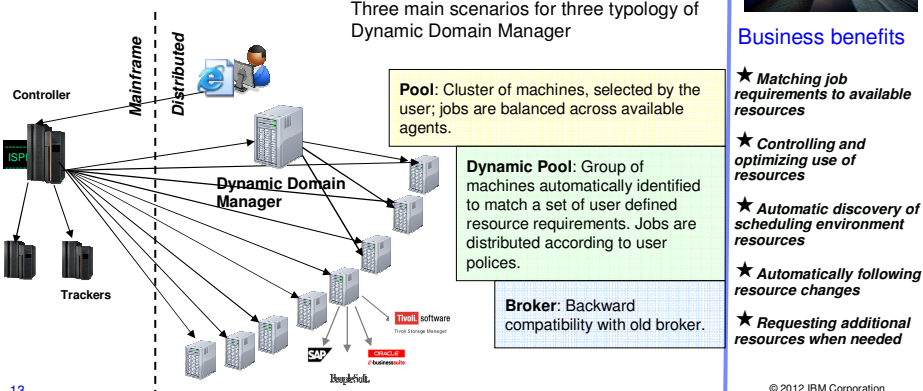
Dynamic zCentric end-to-end : key points

Scenario

- As a standard practice in the workload automation discipline, the insurance company has the target to optimize available resources, and implement load balancing policies where possible. The company has adopted the zCentric end-to-end solution for its simplicity, and they would like to exploit brokering capabilities.

Implement the broker technology in the zCentric end-to-end solution.

Three main scenarios for three typology of Dynamic Domain Manager

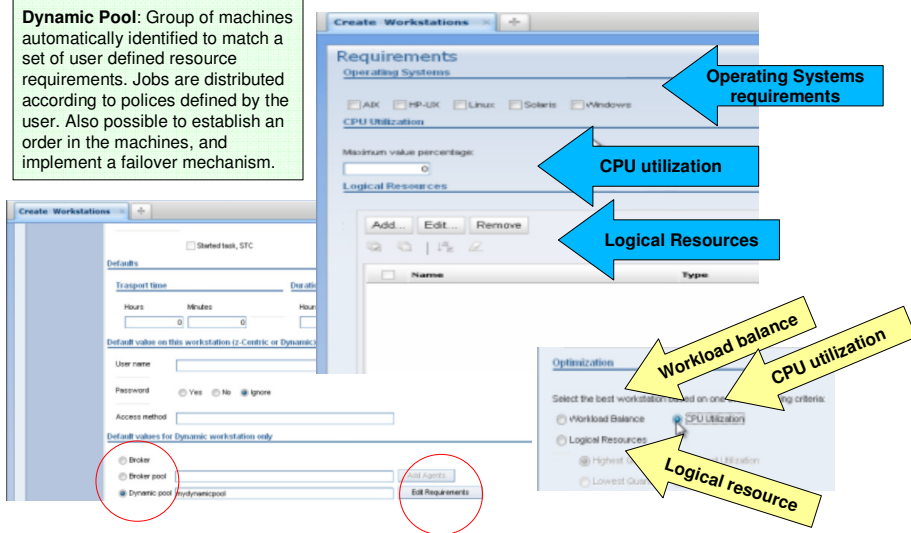


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Dynamic zCentric end-to-end : dynamic pool

- Three types of Dynamic Pools, to implement three types of scenarios:

Dynamic Pool: Group of machines automatically identified to match a set of user defined resource requirements. Jobs are distributed according to policies defined by the user. Also possible to establish an order in the machines, and implement a failover mechanism.



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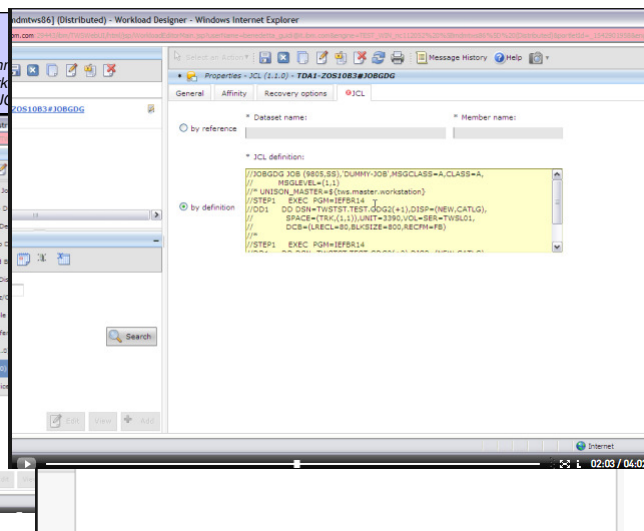
Distributed-driven end-to-end : key points

Scenario

- A rocket company's IT environment has a mix of job scheduling with Tivoli Workload Scheduler and partly run native JCL jobs.

Example

- Easy to integrate with existing HT
- No need for a new JCL
- Highly scalable
- Created by the user
- TW
- Re



15

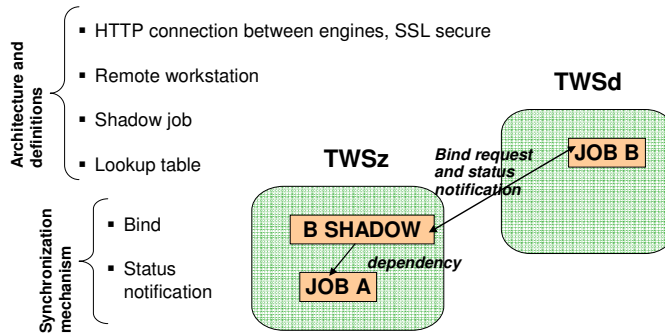
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Cross-dependencies : key points

Scenario

- An enterprise organization comprises multiple activities; some of them are run in different sites or involve different organizational units; others require different skills to be run. For these reasons scheduling environments must be kept *separated*.
- Nevertheless, none of these environments is completely isolated from the others but most of the times they need to *interoperate to exchange or to synchronize on data and activities*.

Easier mapping of workflows spanning multiple engines.



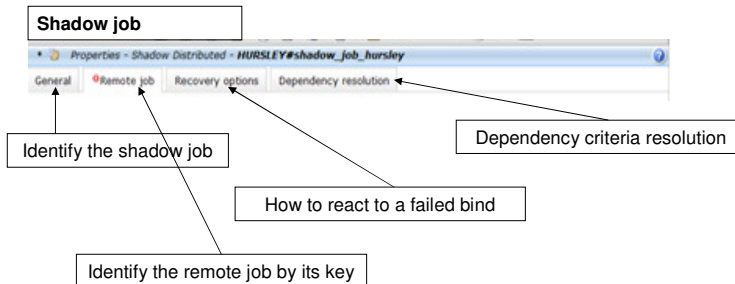
Business benefits

- ★ Evolve multi-master configuration, linking cross activities
- ★ Consolidate management and monitoring of workloads spread across multiple masters

Cross-dependencies : key points

Definitions

- New "remote" workstation to represent the remote environment running the job that we want to involve in the cross-dependency
- "Shadow" job (on the remote workstation) to mirror the remote dependent job
- Dependency between the job and the shadow job
- Lookup table



■TWS PARMLIB

– Remote Controller

```
ROUTOPTS HTTP(ZT01CROS:'10.3.20.1'/521/Z)

HTTPOPTS TCPIPJOBNAME('TCPIP')
          HOSTNAME(10.3.20.2)
          HTTPPORTNUMBER(531)
          ...
```

– Main Controller

```
ROUTOPTS HTTP(ZT01CROS:'10.3.20.2'/531/Z)

HTTPOPTS TCPIPJOBNAME('TCPIP')
          HOSTNAME(10.3.20.1)
          HTTPPORTNUMBER(521)
          ...
```

```
----- CREATING GENERAL INFORMATION ABOUT A WORK STATION -----
Command ==>
Enter the command R for resources A for availability 0 for end-to-end options
or D for Destinations above, or enter data below:

WORK STATION NAME ==> WC01
DESCRIPTION ==> Remote workstation from WC01
WORK STATION TYPE ==> R
                   G General, C Computer, P Printer
                   R Remote Engine
REPORTING ATTR ==> A
                   A Automatic, S Manual start and completion
                   C Completion only, N Non reporting
PRINTOUT ROUTING ==> SYSPRINT The ddname of daily plan printout data set
SERVER USAGE ==> N
                   Parallel server usage C, P, G or N
DESTINATION ==> ZT01CROS Name of destination
Options: allowed Y or N
SPLITTABLE ==> N
STARTED TASK, STC ==> N
AUTOMATION ==> N
WAIT ==> N
VIRTUAL ==> N
JOB SETUP ==> N
WTO ==> N
FAULT-TOLERANT AGENT ==> N
Z-CENTRIC AGENT ==> N
DYNAMIC ==> N
REMOTE ENGINE TYPE ==> Z
                   Z z/OS or D Distributed
Defaults:
TRANSPORT TIME ==> 00.00 Time from previous work station HH.MM
DURATION ==> Duration for a normal operation HH.MM.SS
```

Remote Controller

Row	Oper	Duration	Job name	Internal predecessors	Morepreds	No. of
cmd	ws	no.	HH.MM.SS		-IntExt-	Conds
WC01	010	00.03.00	BKPJS10		0 0	0
C01J	020	00.00.10	TESTVAR	010	0 0	0

***** Bottom of data *****

```

----- z/OS REMOTE JOB INFO
Command ==>
Enter/Change data below:
Shadow job data:
Application : TESTCROSSDEPZ      Test var calc
Operation   : WC01 10
COMPLETE IF BIND FAILS ==> N      Automatically co
                                     if the remote jo
Remote job data:
APPLICATION ID      ==> BACKUPJS
OPERATION NUMBER    ==> 010
    
```

Main Controller

enter the GRNTH command to view the list graphically.

Application : BACKUPJS			Backup of JS		
Row	Oper	Duration	Job name	Internal predecessors	
cmd	ws	no.	HH.MM.SS		
CPU1	010	00.00.01	BKPJS10		

***** Bottom of data *****

Multi-engines monitoring view

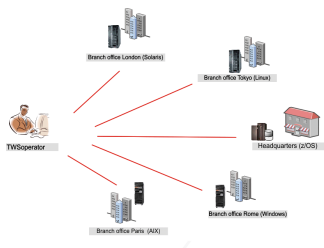
Scenarios

- An enterprise organization consists of a headquarter where central office accounting department is located, and multiple branch offices located all over the world, where several administrative departments carry out accounting activity. The central office is in charge of the company's entire accounting workload. Therefore, the Tivoli Workload Scheduler operator must verify that all the workload processing for the company proceeds smoothly and without errors and needs an aggregated and comprehensive workload management

- Multi engines monitoring** feature represents one step forward in consolidation of activities spanning multiple scheduling environments
- It provides an aggregated vision and monitoring of workloads running on different engines

Business benefits

- ★ Provide an aggregated view of cross-engines workload, for easy monitoring and immediate perception of workload ongoing status



Multi-engines monitoring view

Definition

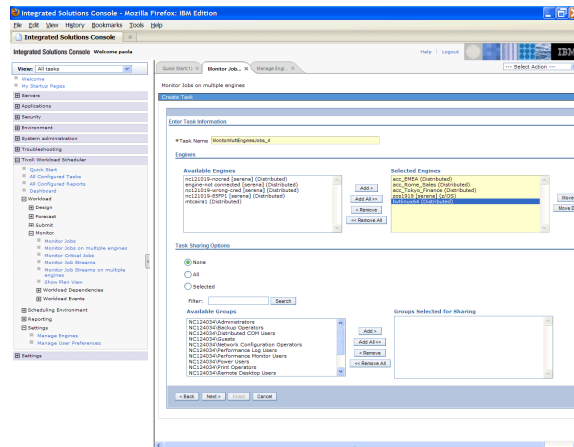
- Create a **New Task** and select **Multiple Engines Monitor Task**.

- Then **Select the engines** which you want to be involved in the query.

- Define filtering

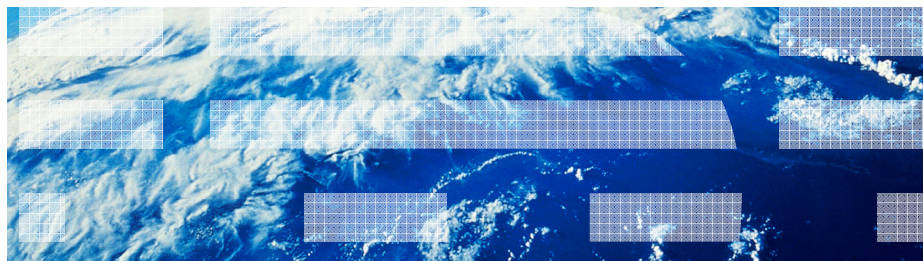
- Select columns

- Run the task



Multi-engines monitoring view

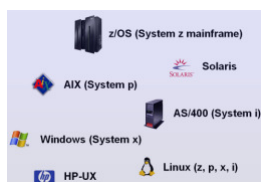
ies... More Actions Graphical Views					Set Status...		
Refresh in 0:09:17 00					Execute		
					Delete		
					NOP		
					UN-NOP		
					Edit JCL...		
					Critical Path		
					Restart and Cleanup		
					Fast Job Restart		
					Fast Step Restart		
					Browse Operator Instruction...		
					Job Setup...		
					Recovery Info...		
					Automatic Recovery		
					Conditions		
					Open Documentation		
					Successful		
					Held		
					Error		
					Successful		



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Modern challenges in the batch processing



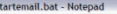
```

ZFile zFileIn = new ZFile("//DD:INPUT", "rb,type-record,noseek");
ZFile zFileOut = new ZFile("//DD:OUTPUT", "wb,type-record,noseek");
try {
    byte[] recBuf = new byte[zFileIn.getRecL()];
    int nRead;
    while((nRead = zFileIn.read(recBuf)) >= 0) {
        zFileOut.write(recBuf, 0, nRead);
    };
} finally {
    zFileIn.close();
    zFileOut.close();
}

```

[illegible]

```
export FILE=-fi listanomi.file
export PARM=-c wmc -dea 180 -i 30 -r 125
echo $HOME/bin/filewatch $SPARM /nico/$FILE
$HOME/bin/filewatch $SPARM $FILE
echo
echo Show content of directory if the file exists
echo
ls -la /nico
```



```

startemail.bat - Notepad
File Edit Format View Help
copy *.* %systemdrive%\temp
%systemdrive%\temp
cd temp
start /w %systemdrive%\temp\si_install_win.exe
start /w %systemdrive%\temp\unstartemail.exe
exit

```

```

CONCATENATE REPORTROWS-LINE '-' T100T-TEXT
INTO REPORTROWS-LINE SEPARATED BY SPACE.
MODIFY REPORTROWS INDEX 1.
SELECT RSGNR
TEXT
INTO (T100-RSGNR,
T100-TEXT)
FROM T100
WHERE SPEL = SY-LANGU "T100-MATTELANG
ANDRBE = T100-ARBEID.
IF T100-MATTELANG <> SY-LANGU,
SELECT SINGLE TEXT
INTO T100-TEXT
FROM T100
WHERE SPEL = SY-LANGU
ANDRBE = T100-ARBEID

```



How Version 8.6 contributes to the Batch Modernization



Examples of batch modernization

zConnector:

Batch as a service for applications

Transform: batch applications using modern languages (ex. COBOL to Java)

Re-use: existing applications with business oriented Web Services

TWA V8.6 helps supporting transformation and re-using projects

- Invoke scheduling services as Java API
 - Through **zConnector**, now running also on z/OS
- Enable wrapping existing scheduling services with **web services**
 - Edit and submit jobstreams with variable substitution
- Embrace scheduling of Java and Web Services

★ Reduce costs offloading MIPS to zAAP

★ Enable easy remote access to scheduling services

★ Re-use of existing processes running rather than encouraging a re-write

How Version 8.6 contributes to the Batch Modernization

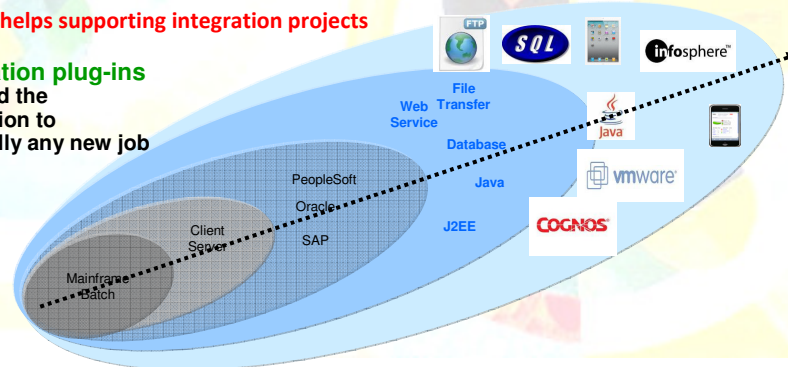


Examples of batch modernization

Integrate: legacy applications with new applications

TWA V8.6 helps supporting integration projects

- **Application plug-ins** to extend the automation to potentially any new job types

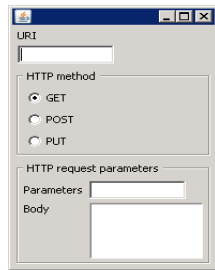


Application Plug-ins : details

What we offer to 3^o parties (Clients, BP, System Integrators) for new Application Plug-ins implementation

- **Tivoli Workload Scheduler Integration Workbench**
 - Takes you through the **creation** of your plug-ins
- Two main phases:
 - Panels creation (AUIML file)
 - Execution method creation (JSDL)

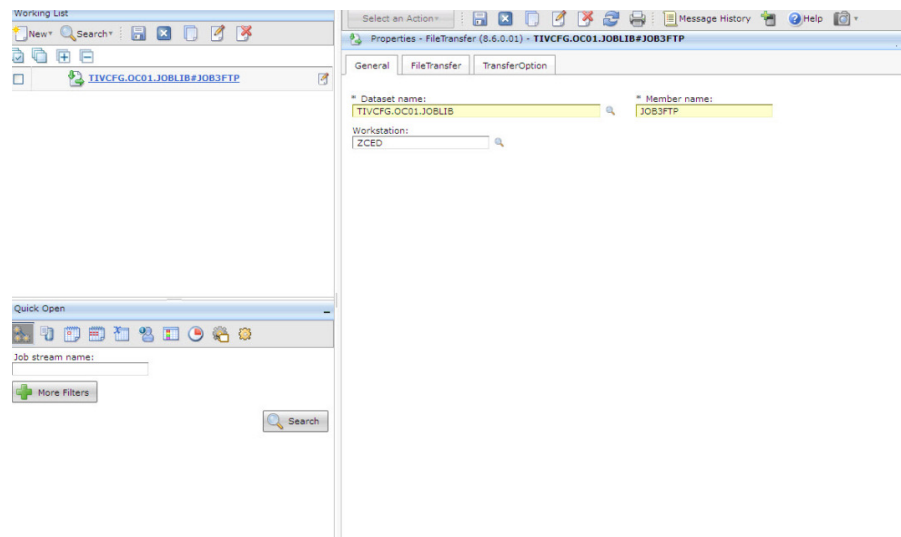
Application
Plug-in
(jar file)



- After **deployment** of new Application Plug-in, you will be able to manage the new job type in the same fashion as all other TWA job types creation (JSDL)



Application Plug-ins : details




```

Menu Utilities Compilers Help
BROWSE TIVCFG.OC01.JOBLIB(JOB3FTP) Line 00000000 Col 001 080
Command ==> Scroll ==> PAGE
***** Top of Data *****
//TASKTYPE=filetransfer
<?xml version="1.0" encoding="UTF-8"?>.<jsdl:jobDefinition xmlns:jsdl="http://\
www.ibm.com/xmlns/prod/scheduling/1.0/jsdl" xmlns:jsdlfiletransfer="http://www.\
ibm.com/xmlns/prod/scheduling/1.0/jsdlfiletransfer" name="filetransfer">.<jsd\
l:application name="filetransfer">.<jsdlfiletransfer:filetransfer>.\
<jsdlfiletransfer:uploadInfo>.<jsdlfiletransfer:server>10.3\
.20.1</jsdlfiletransfer:server>.<jsdlfiletransfer:localfile>/ho\
me/PoI/${OADOWNER}.txt</jsdlfiletransfer:localfile>.<jsdlfiletr\
ansfer:remoteFile>${OADOWNER}.FTP.TXT</jsdlfiletransfer:remoteFile>.\
<jsdlfiletransfer:localCredentials>.<jsdl:userNam>r\
oot</jsdl:userNam>.<jsdl:password>{aes}ePEKgz/XGrgxvYlWQK8\
iHY+VZAgZbPDBzVQeDTX71QQ=</jsdl:password>.</jsdlfiletransfer:lo\
calCredentials>.<jsdlfiletransfer:remoteCredentials>.\
<jsdl:userNam>${OADOWNER}</jsdl:userNam>.<jsdl:\
password>${OADOWNER}</jsdl:password>.</jsdlfiletransfer:remoteC\
redentials>.<jsdlfiletransfer:protocol>FTP</jsdlfiletransfer:pr\
otocol>.<jsdlfiletransfer:transferMode>ascii</jsdlfiletransfer:\
transferMode>.</jsdlfiletransfer:uploadInfo>.</jsdlfiletran\
sfer:filetransfer>.</jsdl:application>.</jsdl:jobDefinition>
***** Bottom of Data *****

```

Batch Modernization: Job executors

- Direct interface with TWS for specific typical and emerging workloads
- No need to “invent” a JCL to run such workload types
- Simple interface

```

//JOBREC
keyword (value)
keyword (value)
//END JOBREC

```

▪ Examples

– SQL executor

```

//JOBREC
JOBTYPE (/database)
STATEMENT20 (SELECT * FROM SYSTOOLS.POLICY)
DBNAME (DBWEB)
DBTYPE (DB2)
...
//END JOBREC

```

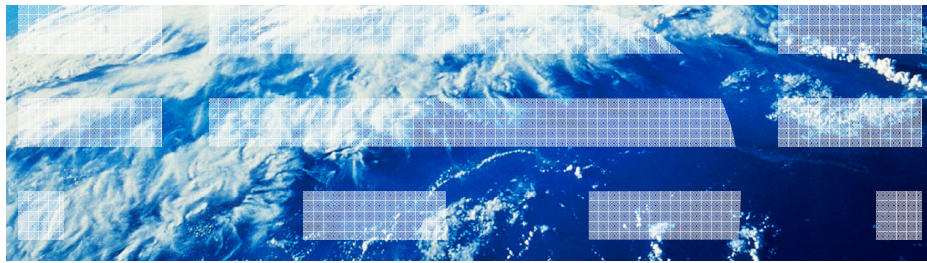
– File Transfer executor

```

//JOBREC
JOBTYPE (/file transfer)
TRANSFERTYPE (DOWNLOAD)
SERVER (server address)
LOCALFILE (C:\file1.txt)
REMOTEFILE (/file1.txt)
...
//END JOBREC

```

Smarter Batch, Cloud and usability



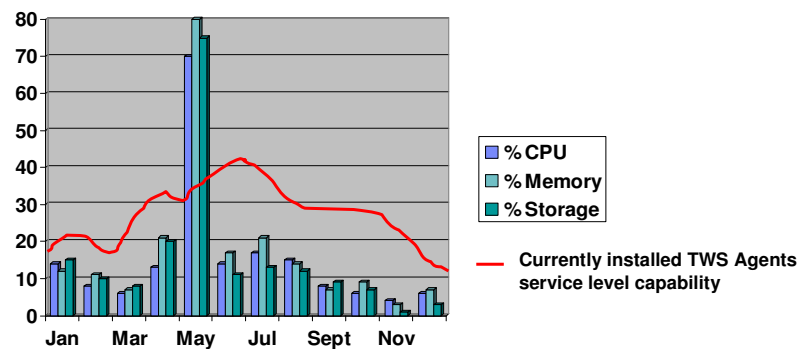
Tivoli software

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Batch Cloud Scenario Example

Tivoli software

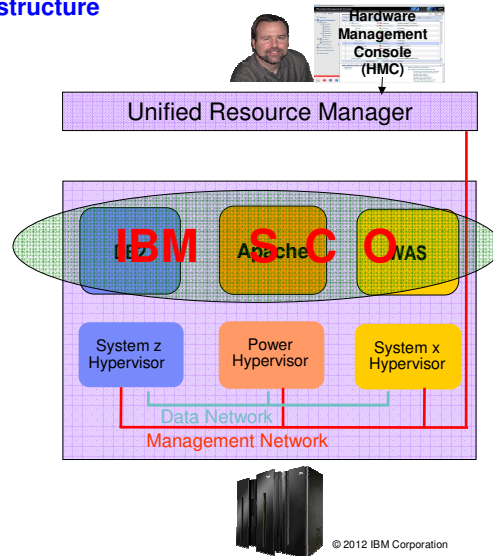
- A very big cross platform batch application needs to run once a year
- A huge number of distributed servers is necessary
- TWS agents currently installed cannot cover all the demanded resources



WOW (What Only When)

IBM SmartCloud Provisioning realizes the “service on demand” cloud infrastructure

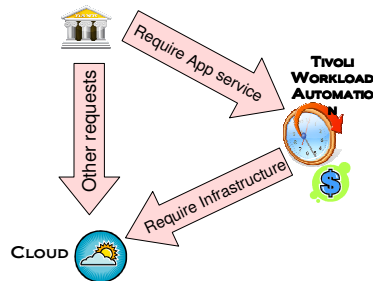
- Automatic inventory of all elements
- Update configuration and service
- Create virtual machines across all hypervisors from one console
- Manage performance of virtual machines as a group for a business workload
- IBM SmartCloud Orchestrator will help deploying the right software in each virtual image
 - What is needed only when it is needed
- TWS will manage this on demand batch environment just for that critical day



Cloud accelerates the need for workload automation

Value proposition

- ★ TWS has moved to the center between the request for business services and the demand for Cloud infrastructure and resources: it allows to manage mission-critical, end-to-end workloads through fluid and elastic cloud resources



Capabilities

- TWS v8.6 provides IBM SCO integration for
 - Immediate provisioning of workload automation ready environment, for temporary demand
 - Elastic provisioning of workload automation resource for intermittent demand

Business Value

- ★ Reduce resource, installation and customization costs and increase productivity
- ★ Adapt quickly in the context of limited resources

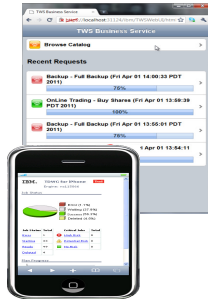
Batch Cloud: Self-service online catalog (TWS 8.6.1)



Provide agility, speed and efficiency through smart devices support

Value proposition

- ★ TWS provides a self-service front-end for business users to trigger and control ad-hoc tasks



Capabilities

- **TWS v8.6 + FP1** provides a web-based portal, also available on smart devices:
 - Menu of pre-defined cataloged business services
 - Easy-to-use self-service interface
 - Control of end-to-end business service lifecycle

Business Value

- ★ *Streamline request of business services through easy-to-use online catalog*
- ★ *Submit ad-hoc service from anywhere at anytime*

The output collector (new of TWS 8.6.1)



- **New Output Collector component** (std task) automatically retrieves z-centric job output
- It Automate and control the entire job log collection process for the z centric agents.

This is done by:

- 1 Retrieving the joblog from the agent (or the dynamic domain manager)
- 2 Building an header containing run time information for every joblog released in the z-centric environment
- 3 Sending to the JES for output management tool to archive



Highly customizable

- A joblog header template sample comes with the installation (EQQUOUC)
- You can edit it and copy it selecting the variables considered useful

```
TWSSSD.CWSG.PARM(HEADER) - 01.19 Columns 06
***** Top of Data *****
=====
JOBLOG HEADER
=====
= Occurance name : ${ocname}
= Occurance IA  : ${IAYYYY}/${IAMM}/${IADD} ${IAhh}:${IAMm}
= Job name      : ${jobname}
= Work station  : ${username}
= Operation number: ${opernum}
= Start time    : ${SYYYY}/${SMH}/${SDD} ${Shh}:${Smm}
= End time      : ${EYYYY}/${EHM}/${EDD} ${Ehh}:${Emm}
= Process ID    : ${processid}
= Duration      : ${duration}
= Status        : ${status}
= Return code   : ${returncode}
= Hostname      : ${hostname}
```

Writing sysout to JES

Row	Application id	Operat	Jobname	Input Date	Arrival Time	Suc	Pre	Cond	Dep	S
cmd	APPLZCE6	ZCE6 001	VPCENE	11/10/20	11.11	0	0	0	0	C
---	APPLZCE6MULTI	ZCE6 001	VPCEN1	11/10/20	11.11	29	0	0	0	C
---	APPLZCE6MULTI	ZCE6 002	VPCEN1	11/10/20	11.11	0	1	0	0	C

Display	Filter	View	Print	Options	Help
SDSF STATUS DISPLAY ALL CLASSES					
NP	JOBNAME	JobID	Owner	Prty	Queue
	CWSG	STC00045	ZAINO	15	EXECUTION
?	TWSG	STC00046	ZAINO	15	EXECUTION

SDSF	JOB DATA	SET DISPLAY	- JOB TWSG
NP	DDNAME	StepName	ProcStep
	JESMSG LG	JES2	
	JESJCL	JES2	
	JESYSMSG	JES2	
	EQQLLOG	TWSG	
	SYSOUT	TWSG	
S	VPCENE	TWSG	


```

SDSF OUTPUT DISPLAY TWSG STC00046 DSID 104 LINE 0 COLUMNS 02- 81
COMMAND INPUT ==>
***** TOP OF DATA *****
Volume in drive D is New Volume
Volume Serial Number is 06F6-A800

Directory of D:\Program Files\IBM\ITA6\TWS\bin

05/04/2011 07:38 <DIR> .
05/04/2011 07:38 <DIR> ..
04/04/2011 02:15 303,104 filewatch.exe
04/04/2011 02:15 299,008 filewatchdb.exe
04/04/2011 02:14 709,416 JobManager.exe
04/04/2011 02:14 811,008 JobManagerCore.dll
04/04/2011 02:30 33 libb.list
04/04/2011 02:16 344,064 Mover71.dll
04/04/2011 03:09 17,645 setown.cmd
04/04/2011 02:15 8,704 setown.exe
04/04/2011 03:09 3,345 taskLauncher.cmd
04/04/2011 02:14 77,824 taskLauncher.exe
10 File(s) 2,565,152 bytes free
2 Dir(s) 8,665,690,112 bytes free

***** BOTTOM OF DATA *****
  
```

When a job completes successfully or in error, its joblog is automatically collected and written to JES

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Adding a header

```

TWSSD.CWSG.PARM(HEADER) - 01.19 Columns 00
***** Top of Data *****
=====
JOBLOG HEADER
=====
BROWSE SYS12060.T162530.RA000.PERTICA.OPCAWRK1.H0 Line 00000000 Col 001 080 'IAhh':${IAmm}
***** Top of Data *****
=====
JOBLOG HEADER
=====
= Occurrence name : APPLZCE2 i):${Smm}
= Occurrence ID : 2012/02/28 11:11 i):${Emm}
= Job name : VPCEN1
= Work station : ZCE2
= Operation number: 001
= Start time : 2012/02/29 16:26
= End time : 2012/02/29 16:26
= Process ID : 4820
= Duration : 0.00.01
= Status : COMPLETED
= Return code : 0
= Hostname : vperic1.romelab.it.ibm.com
=====
Volume in drive D is New Volume
Volume Serial Number is 06F6-A800

Directory of D:\Program Files\IBM\ITA6\TWS\bin

24/02/2012 10:09 <DIR> .
24/02/2012 10:09 <DIR> ..
23/02/2012 03:26 303,104 filewatch.exe
23/02/2012 03:26 303,104 filewatchdb.exe
23/02/2012 03:28 14,938,112 icudt44.dll

Command ==> Scroll ==> CSR
  
```

You can define in the TWS for z/OS controller parameter library a template for the joblog header.

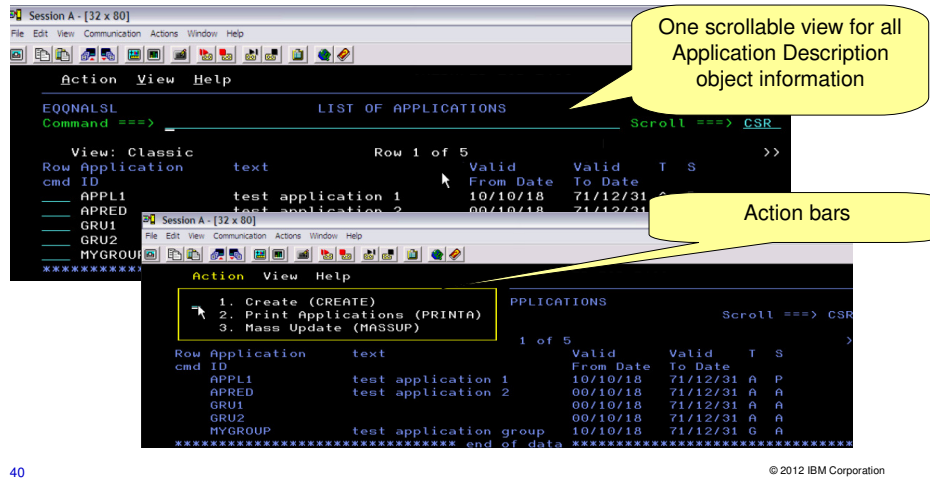
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Scenarios

- Customers require to rapidly navigate across ISPF TWS Dialogs, to accelerate operations, increase speed-up and more confidence with the product interface.



Logon procedure

– ISPLIB

- Include the new panel library SEQQGENU


```
//ISPLIB DD DISP=SHR,DSN=TWS.V8R6.SEQQPENU
// DD DISP=SHR,DSN=TWS.V8R6.SEQQGENU
```

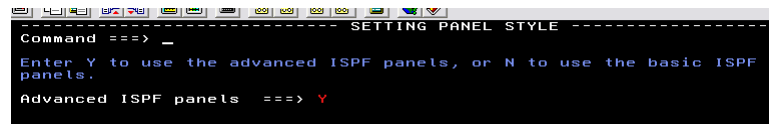
– EQQTML

- Include this new ddname in the logon procedure pointing to the library SEQQLENU

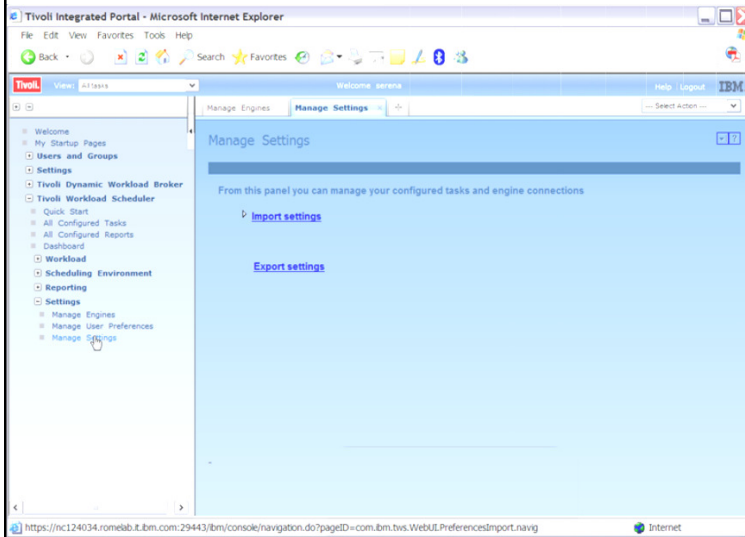

```
//EQQTML DD DISP=SHR,DSN=TWS.V8R6.SEQQLENU
```

TWS ISPF

– From 0.8 set

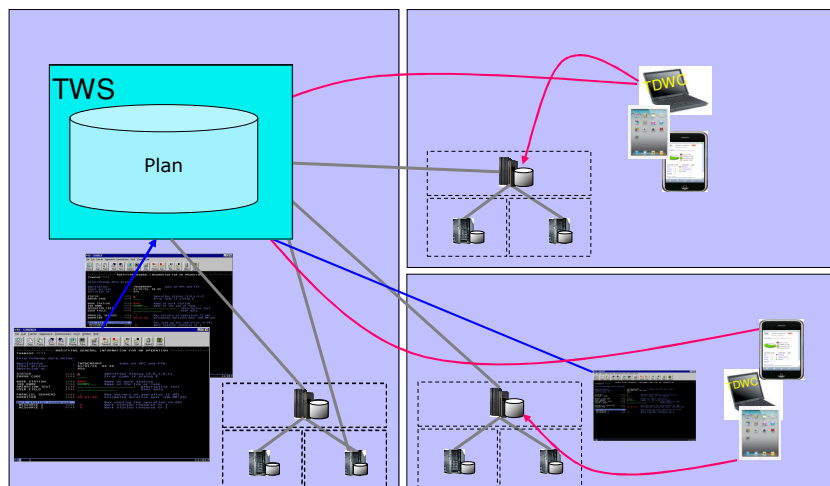


Usability: Tivoli Dynamic Workload Console



- XML support for application plug-ins
- Easy to unload definitions (engines, tasks)
- Easy to import unloaded information

Usability: Operating On Demand





TWS 8.6 End to End deep technical event available on request

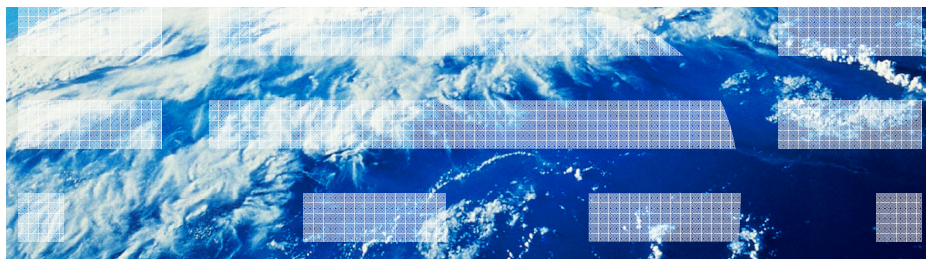
For organizing the event you can contact:

Your local IBM Sales Team

Or

.Domenico Chillemi – nicochillemi@it.ibm.com

.Paola Monteferri – montefer@it.ibm.com



Tivoli software

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TWS zCentric Proof of Technology



- Half day/One day going deep on Tivoli Workload Scheduler 8.6
- The End to End zCentric features will be tested performing a specific Hands-On session
 - zCentric Static jobs (available from TWS 8.5)
 - zCentric Dynamic jobs (available from TWS 8.6)
- Batch Modernization examples will be also tested during the hands on
 - an application plug-in example (available from TWS 8.6)
- Other important recent TWS features will be tested
 - New TWS for z/OS ISPF Panels (available from TWS 8.6)
 - Conditional Dependencies (available from TWS 8.5)
- Last generation batch management with Cloud
 - Demo of the latest Tivoli Dynamic Workload Console tasks within TWS 8.6
 - Self Service Catalog new feature, a strong cloud example in TWS 8.6

